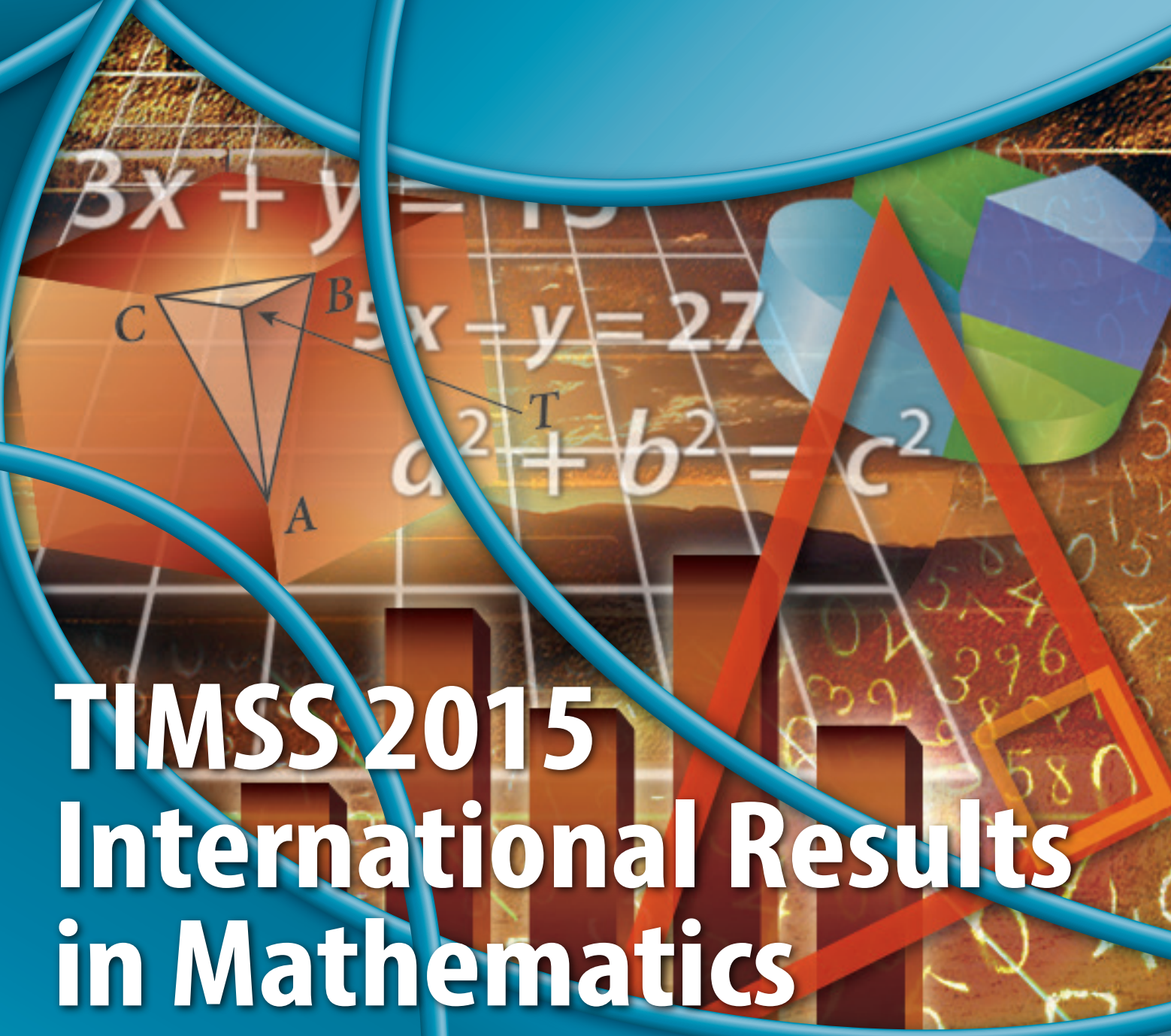
TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS



TIMSS 2015 International Results in Mathematics

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About TIMSS 2015

In 2015, IEA and its TIMSS & PIRLS International Study Center at Boston College conducted TIMSS 2015 at fourth and eighth grades and TIMSS Advanced 2015 for students in the final year of secondary school enrolled in special advanced mathematics and physics programs or tracks. Both TIMSS 2015 and TIMSS Advanced 2015 provide 20-year trend measures for countries that participated in the first TIMSS assessments in 1995.

TIMSS 2015 and TIMSS Advanced 2015 continue the long history of international assessments in mathematics and science conducted by IEA – the International Association for the Evaluation of Educational Achievement. IEA is an independent international cooperative of national research institutions and government agencies that has been conducting studies of cross-national achievement since 1959. IEA pioneered international comparative assessments of educational achievement in the 1960s to gain a deeper understanding of the effects of policies across countries' different systems of education.

IEA's TIMSS & PIRLS International Study Center is located in the Lynch School of Education at Boston College and has been responsible for directing TIMSS and TIMSS Advanced since 1995.

TIMSS 2015

TIMSS is an international assessment of mathematics and science at the fourth and eighth grades that has been conducted every four years since 1995. TIMSS 2015 is the sixth assessment in the TIMSS series monitoring 20 years of trends in educational achievement, together with comprehensive data on students' contexts for learning mathematics and science.

In 2015, 57 countries and 7 benchmarking entities (regional jurisdictions of countries such as states or provinces) participated in TIMSS. In total, more than 580,000 students participated in TIMSS 2015.

The TIMSS 2015 mathematics and science assessments are based on comprehensive frameworks developed collaboratively with the participating countries. For each curriculum area at each grade, the frameworks are organized around two dimensions: a content dimension specifying the content to be assessed and a cognitive dimension specifying the thinking processes to be assessed. The TIMSS assessments contain nearly 800 assessment items, about 200 per grade for each curriculum area. The majority of TIMSS items assess students' applying and reasoning skills.

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New for TIMSS 2015, a home questionnaire was completed by fourth grade students' parents or caregivers, in addition to the questionnaires routinely given at both fourth and eighth grades to students, teachers, school principals, and curriculum specialists. The questionnaire data primarily are reported in the form of indices created using IRT scaling methods, and results are presented for three regions of the scales (most to least desirable). When possible, scales were developed in parallel to provide comparisons between mathematics and science as well as the fourth and eighth grades.

TIMSS has the goal of helping countries make informed decisions about how to improve teaching and learning in mathematics and science. With its strong curricular focus and emphasis on policy relevant information about the home, school, and classroom contexts for learning, TIMSS is a valuable tool that countries can use to evaluate achievement goals and standards and monitor students' achievement trends in an international context. The *TIMSS 2015 Encyclopedia* complements the quantitative information in the international reports with a chapter by each country summarizing mathematics and science curricula, instructional practices, and teacher education requirements.

Countries Participating in TIMSS 2015

Exhibit 1 lists the 57 countries participating in TIMSS 2015, including some distinct educational systems within countries that have always participated separately throughout IEA's long history (e.g., the Dutch-speaking part of Belgium and Hong Kong Special Administrative Region (SAR) of the People's Republic of China). In addition, TIMSS had 7 benchmarking participants including a variety of educational entities.

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Exhibit 1: Countries Participating in TIMSS 2015

Armenia
Australia
Bahrain
Belgium (Flemish)
Botswana
Bulgaria
Canada
Chile
Chinese Taipei
Croatia
Cyprus
Czech Republic
Denmark
Egypt
England
Finland
France
Georgia
Germany
Hong Kong SAR
Hungary
Indonesia
Iran, Islamic Rep. of
Ireland
Israel
Italy
Japan
Jordan
Kazakhstan
Korea, Rep. of
Kuwait
Lebanon
Lithuania
Malaysia
Malta
Morocco
Netherlands
New Zealand
Northern Ireland
Norway
Oman
Poland
Portugal
Qatar
Russian Federation
Saudi Arabia
Serbia
Singapore
Slovak Republic
Slovenia
South Africa
Spain
Sweden
Thailand
Turkey
United Arab Emirates
United States

Benchmarking Participants

Buenos Aires, Argentina
Ontario, Canada
Quebec, Canada
Abu Dhabi, UAE
Dubai, UAE
Florida, US

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Countries and benchmarking participants could elect to participate in the fourth grade assessment, the eighth grade assessment, or both. Also, countries where students were expected to find the TIMSS assessments too difficult at the fourth grade could participate in the newly developed TIMSS Numeracy assessment, a less difficult version of the fourth grade mathematics assessment. Fifty countries and the 7 benchmarking participants administered the fourth grade assessments. Of those, 7 countries and 1 benchmarking entity participated in the Numeracy assessment, including Bahrain, Indonesia, Iran, Kuwait, Jordan, Morocco, and South Africa as well as Buenos Aires. Each of these participants gave both the fourth grade assessments in mathematics and science as well as the Numeracy assessment, except Jordan and South Africa that participated in Numeracy only. Thirty-nine countries and the 7 benchmarking participants administered the eighth grade mathematics and science assessments. Norway chose to assess fifth and ninth grades to obtain better comparisons with Sweden and Finland (but also collected benchmark data at fourth and eighth grades). Botswana and South Africa assessed ninth grade to better match their curricula and to maintain trend measurement. Exhibit 2 provides more information about the students assessed in TIMSS 2015, including average ages as well as policies for age of entry, promotion, and retention.

In each grade, nationally representative samples of approximately 4,000 students from 150-200 schools participated in TIMSS 2015. Including the mathematics, numeracy, and science assessments and questionnaires, more than 312,000 students, 250,000 parents, 20,000 teachers, and 10,000 schools participated in the fourth grade assessments, and a further 270,000 students, 31,000 teachers, and 8,000 schools in the eighth grade assessments.

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Exhibit 2: Information About the Students Assessed in TIMSS 2015

Reported by National Research Coordinators, except Average Ages are from TIMSS 2015 Data

Country	Grade 4		Grade 8		Information About Policy on Students' Age of Entry to Primary School	Information About Students' Age of Entry to Primary School in Practice
	Country's Name for Fourth Year of Formal Schooling*	Average Age at Time of Testing	Country's Name for Eighth Year of Formal Schooling*	Average Age at Time of Testing		
Australia	Year 4	10.0	Year 8	14.0	Varies by state, but generally children must begin school by age 6.	Most children begin school when they are 4.5–5 years old, but some wait until the compulsory age, either on advice from preschool staff or on the judgment of parents, usually because of maturity.
Bahrain	Grade 4	9.9	Grade 8	14.0	Children must be 6 years old to begin school in September.	Follows policy
Belgium (Flemish)	Grade 4	10.1			Children must begin school in September during the calendar year of their 6th birthday.	Parents can keep their child in kindergarten until age 7, with approval from an independent counseling center. Homeschooling is also practiced. Children with serious disabilities can be exempt from compulsory education.
Botswana (9)			Grade 9	15.6	Children must be 6 years old by the end of June to begin in January of the same calendar year.	Children from remote areas or disadvantaged children may begin later than age 6. Children enter private schools at age 5.
Bulgaria	Grade 4	10.8			Children must begin school during the calendar year of their 7th birthday.	Children may begin at the age of 6 with parental/guardian discretion.
Canada	Grade 4	9.9	Grade 8	14.0	Varies by province, but most children begin school at the age of 6.	Practice varies by province, but generally parents have the option of accelerating or delaying enrollment by one year. Some parents opt to homeschool their children.
Chile	Basic 4	10.2	Basic 8	14.3	Children must be 6 years old by March 31 of the year they begin school.	Principals are allowed some discretion regarding the admission of children who will turn 6 after March 31 but before June 30.
Chinese Taipei	Grade 4	10.2	Grade 8	14.3	Children must be 6 years old to begin school in September.	Parents can apply for early enrollment to elementary schools. Legal representatives can apply to delay enrollment to elementary schools for children with disabilities.
Croatia	Grade 4	10.6			Children can begin school during the calendar year of their 6th birthday.	Children typically begin primary school at age 7 because their parents feel they will benefit from being more mature.
Cyprus	Grade 4	9.8			Children can begin school if they are 5.75 years old before September 1.	Parents can apply to delay enrollment of children for one year with the approval of the Director of Primary Education.
Czech Republic	Grade 4	10.4			Children must be 6 years old to begin school in September.	On one hand, parents may request that children born after September 1 be allowed to enroll at age 5 with pedagogical and psychological certification. On the other hand, about 22% of students every year receive permission to postpone enrollment for one year.
Denmark	Grade 4	10.9			Children can begin school during the calendar year of their 6th birthday.	Parents may request early enrollment for mature children whose 5th birthdays are before October 1 from the school principal. Parents may also request a one-year postponement of enrollment for developmentally challenged children from the municipal council.
Egypt			–	14.1	Children must be 6 years old by the end of September to begin school.	Follows policy
England	Year 5	10.1	Year 9	14.1	Children must begin school during the calendar year of their 5th birthday.	Most children begin school the September after their 4th birthday. Parents may request that their child's entry to school is deferred until later in the school year and up until the compulsory school age.
Finland	Grade 4	10.8			Children must begin school during the calendar year of their 7th birthday.	It is possible for parents to enroll children one year earlier or one year later than the official policy.
France	CM1	9.9			Children must begin school in September of the calendar year of their 6th birthday.	In rare cases it is possible for parents and/or teachers to request early enrollment for academically advanced and mature children or to request a one-year delay in enrollment for immature children.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

* The TIMSS target population is the grade that represents four years or eight years of schooling counting from the first year of ISCED Level 1. However, IEA has a policy that students do not fall under the minimum average age of 9.5 years old (Grade 4) or 13.5 years old (Grade 8) at the time of testing, so England, Malta, and New Zealand assessed students in their fifth year or ninth year of formal schooling.

A dash (-) indicates comparable data not available.

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Exhibit 2: Information About the Students Assessed in TIMSS 2015 (Continued)

Country	Grade 4		Grade 8		Information About Policy on Students' Age of Entry to Primary School	Information About Students' Age of Entry to Primary School in Practice
	Country's Name for Fourth Year of Formal Schooling*	Average Age at Time of Testing	Country's Name for Eighth Year of Formal Schooling*	Average Age at Time of Testing		
Georgia	Grade 4	9.7	Grade 8	13.7	Children must be 6 years old to begin school.	Follows policy
Germany	Grade 4	10.4			Varies by state, but generally children must have reached their 6th birthday before a statutory qualifying date (usually between June 30 and September 30) to begin school on August 1.	Varies by state, but generally, parents may request early enrollment from the local primary school or request deferred enrollment from the school administration for children with demonstrated physical or mental disabilities.
Hong Kong SAR	Primary 4	10.1	Secondary 2	14.2	Children begin school if they are 5.75 years old before September 1.	Some parents choose not to enroll their children according to policy.
Hungary	Grade 4	10.7	Grade 8	14.7	Children must be 6 years old before August 31 to begin school that year.	Children may remain in preschool for an extra year upon recommendation from a committee of experts.
Indonesia	Grade 4	10.4			Children must be 6 years old to begin school in August.	Parents may request early enrollment for mature students. In rural areas, it is common for children to enroll at age 7.
Iran, Islamic Rep. of	Grade 4	10.2	Grade 8	14.2	Children must be 6 years old by September 21 to begin school that year.	Parents may enroll their children at age 7.
Ireland	Fourth Class	10.4	Second Year	14.4	Children can begin school (ISCED 0) at age 4, but must begin school by age 6.	Most children begin primary school at age 4 –5, the first two years of which are pre-primary grades.
Israel			Grade 8	14.0	Children begin school the calendar year of their 6th birthday.	Parents may apply for delayed enrollment and have the final say in enrollment decisions.
Italy	Primary Grade 4	9.7	Lower Secondary Grade 3	13.8	Children begin school the calendar year of their 6th birthday.	Parents have discretion over early or delayed enrollment.
Japan	Grade 4	10.5	Grade 8	14.5	Children must be 6 years old by April 1 to begin school.	Follows policy
Jordan	Grade 4	9.8	Grade 8	13.8	Children must be at least 5.75 years old by September 1 to begin school.	Follows policy
Kazakhstan	Grade 4	10.3	Grade 8	14.3	Children must begin school at age 6.	Parents can delay enrollment for one year.
Korea, Rep. of	Elementary School Grade 4	10.5	Middle School Grade 2	14.4	Children must be 6 years old by the end of December to begin school the following March.	Parents can decide to enroll academically advanced children one year earlier or postpone enrollment for one year for health reasons with the permission of the school superintendent.
Kuwait	Grade 4	9.7	Grade 8	13.7	Children must be 6 years old by March 15 to begin school that calendar year.	Follows policy
Lebanon			Grade 8	14.2	Children must be 6 years old by the end of June to begin school the following September.	Parental discretion is not allowed in private schools. In public schools there may be special cases authorized by the Ministry of Education.
Lithuania	Grade 4	10.7	Grade 8	14.7	Children begin school during the calendar year of their 7th birthday.	Parents can request early enrollment or request to delay enrollment by one year.
Malaysia			Form 2	14.3	Children must be at least 6 years old to begin school.	Follows policy
Malta			Year 9	13.8	Children begin school during the calendar year of their 5th birthday.	Follows policy
Morocco	Grade 4	10.3	Middle School Year 2	14.5	Children must be 6 years old to begin school.	Follows policy
Netherlands	Group 6	10.0			Children must start kindergarten on the first day of the month after their 5th birthday.	Most children begin kindergarten when they are 4 years old and begin primary school when they are 6 years old. Some children start primary school later if the school thinks that the child would benefit from being more mature. Parents are involved in this decision, but the school has the final say.
New Zealand	Year 5	10.0	Year 9	14.1	Children can begin school at age 5, but must be enrolled in primary school by their 6th birthday.	Most children begin school on or soon after their 5th birthday.
Northern Ireland	Year 6	10.4			Children must be 4 years old by July 1 to begin school in September.	Follows policy

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2: Information About the Students Assessed in TIMSS 2015 (Continued)

Country	Grade 4		Grade 8		Information About Policy on Students' Age of Entry to Primary School	Information About Students' Age of Entry to Primary School in Practice
	Country's Name for Fourth Year of Formal Schooling*	Average Age at Time of Testing	Country's Name for Eighth Year of Formal Schooling*	Average Age at Time of Testing		
Norway (5, 9)	Grade 5	10.7	Grade 9	14.7	Children must begin school during the calendar year of their 6th birthday.	Follows policy
Oman	Grade 4	9.6	Grade 8	14.0	Children begin school during the calendar year of their 6th birthday.	Follows policy
Poland	Grade 4	10.7			Children must begin school during the calendar year of their 6th birthday.	From 2012–2015, parents could decide whether to send their children to school at age 6 or age 7.
Portugal	Grade 4	9.9			Children must be 6 years old by September 15 to begin school in that calendar year.	Parents or legal guardians can request that children who will be 6 years old between September 16 and December 31 be allowed to enroll in primary education in the school year of their 6th birthday.
Qatar	Grade 4	10.1	Grade 8	14.1	Children must be 6 years old by the end of December to begin school in September.	Follows policy
Russian Federation	Grade 4	10.8	Grade 8	14.7	Children begin school when they are at least 6.5 years old by September 1 of that school year.	Children under 6.5 years old may begin school with consent of the parents and school principal. Parents may delay entry until age 7 or older if they want the child to be more mature, or for health reasons.
Saudi Arabia	Grade 4	10.0	Grade 8	14.1	Children must be 6 years old by the end of August to begin school in September.	Follows policy
Serbia	Grade 4	10.7			Children must be 6.5–7 years old to begin school.	Schools may recommend one year of continued preparatory preschool for children not considered school ready. If the child is over 7.5 years old, and due to illness or other differences did not enroll in first grade, he or she may enroll in the first or other appropriate grade based on the results of testing.
Singapore	Primary 4	10.4	Secondary 2	14.4	According to the Compulsory Education Act, children must begin school in the calendar year of their 7th birthday.	Parents may seek a deferral of registration for medical reasons or if the child is homeschooled.
Slovak Republic	Grade 4	10.4			Children must begin school on September 1 if their 6th birthday is before August 31.	Children may begin school early or after an approved delay based on psychological tests and professional recommendations.
Slovenia	Grade 4	9.8	Grade 8	13.8	Children begin school during the calendar year of their 6th birthday.	Parents can request early enrollment for children who have their 6th birthday in January of the next calendar year or request a one-year delay in enrollment for medical or developmental reasons.
South Africa (5, 9)	Grade 5	11.5	Grade 9	15.7	Children must be 5 years old and have their 6th birthday by June 30 of the next year to begin school mid–January.	Follows policy
Spain	Grade 4	9.9			Children must begin school during the calendar year of their 6th birthday.	Almost all children begin kindergarten at age 3, even though it is not compulsory.
Sweden	Grade 4	10.8	Grade 8	14.7	Children begin school during the calendar year of their 7th birthday.	In special cases students may begin school when they are 6 or 8 years old.
Thailand			Grade 8	14.4	Children must be 6 years old by May 16 to begin school the following academic year.	Follows policy
Turkey	Grade 4	9.9	Grade 8	13.9	Children must be 5.5 years old to begin school in September.	If parents prefer, children ages 5.5–5.75 can delay enrollment for one year. Children ages 5.75–6 can delay enrollment for one year for medical or developmental reasons.
United Arab Emirates	Grade 4	9.8	Grade 8	13.9	Children can begin school during the calendar year of their 6th birthday, but must begin by age 8.	Parents may delay enrollment, but students may not be older than 8 years old on December 31 of their entry year.
United States	Grade 4	10.2	Grade 8	14.2	Each state requires parents to send their children to school between set ages. Required entry is often between 5 to 7 years old, exact age varies by state.	Children typically begin kindergarten at age 5.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2: Information About the Students Assessed in TIMSS 2015 (Continued)

Country	Grade 4		Grade 8		Information About Policy on Students' Age of Entry to Primary School	Information About Students' Age of Entry to Primary School in Practice
	Country's Name for Fourth Year of Formal Schooling*	Average Age at Time of Testing	Country's Name for Eighth Year of Formal Schooling*	Average Age at Time of Testing		
Benchmarking Participants						
Buenos Aires, Argentina	Grade 4	9.8	Secondary 1	14.1	Children must be 6 years old by the end of June to begin school in March of the same year.	Follows policy
Ontario, Canada	Grade 4	9.8	Grade 8	13.8	Students can begin school in September if they have their 6th birthday before December 31.	Parents may enroll their children in junior kindergarten at age 4 or senior kindergarten at age 5. Some students may start school at the junior kindergarten level at 3 years old if their birthday is between September 1 and December 31. In addition, some parents homeschool their children.
Quebec, Canada	Grade 4	10.1	Secondary 2	14.3	Children must be 6 years old by September 30 to begin in September of that calendar year.	Follows policy
Norway (4, 8)	Grade 4	9.7	Grade 8	13.7	Children must be 6 years old by September 30 to begin in September of that calendar year.	Follows policy
Abu Dhabi, UAE	Grade 4	9.8	Grade 8	13.9	Children begin school during the calendar year of their 6th birthday.	Follows policy
Dubai, UAE	Grade 4	9.8	Grade 8	13.9	Children begin school during the calendar year of their 6th birthday.	Follows policy
Florida, US	Grade 4	10.4	Grade 8	14.4	Children must begin school if they have their 6th birthday by February 1 of that school year.	Children who are 5 years old on or before September 1 of the school year are eligible for admission to public kindergarten during that school year, based on rules prescribed by the school board. Parents may choose whether or not to enroll their children in kindergarten. School superintendents may authorize certificates of exemptions from school attendance requirements in certain situations.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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TIMSS Advanced 2015

With the current emphasis on college and career readiness and increasing global competitiveness in STEM (science, technology, engineering, and mathematics) fields, in 2015 TIMSS Advanced once again was joined with TIMSS. First conducted in 1995 and then again in 2008, TIMSS Advanced is the only international assessment that provides essential information about students' achievement in advanced mathematics and physics. It assesses students in their final year of secondary school (often 12th grade) who are engaged in advanced mathematics and physics studies that prepare them to enter STEM programs in higher education.

TIMSS Advanced 2015 was offered together with TIMSS to provide 20 years of trends at three important points in students' schooling (4th grade, 8th grade, and final grade) and provide information about how the foundations established in primary school can influence students' educational career through lower secondary and impact achievement in students' final year of secondary school.

Quality Assurance

TIMSS 2015 made every effort to attend to the quality and comparability of the data through careful planning and documentation, cooperation among participating countries, standardized procedures, and rigorous attention to quality control throughout. The assessments were administered to nationally representative and well-documented probability samples of students in each country. Staff from Statistics Canada and the IEA Data Processing and Research Center (DPC) worked with National Research Coordinators on all phases of sampling activities to ensure compliance with sampling and participation requirements, with the few exceptions from compliance annotated in the data exhibits. The IEA Secretariat worked with the TIMSS & PIRLS International Study Center to manage an extensive series of verification checks to ensure the comparability of translations of the assessment items and questionnaires, and to conduct an international quality assurance program of school visits to monitor and report on the administration of the assessment. IEA DPC staff worked closely with National Research Coordinators all through the project to organize data collection operations and to check all data for accuracy and consistency within and across countries.

TIMSS 2015 Results

The international results for TIMSS 2015 are reported on this website and the results for TIMSS Advanced 2015 also can be accessed from here.

The TIMSS 2015 results are presented separately for mathematics and science, and within each subject separately for fourth grade and eighth grade. Each of the two reports contains 10 chapters or sections providing overviews in the form of infographics and numerous exhibits summarizing

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fourth and eighth grade student achievement distributions, performance at the TIMSS International Benchmarks, achievement trends over time, and achievement in relation to students' home, school, and classroom educational contexts for learning mathematics and science. The exhibits can be downloaded and printed from the Download Center.

The website includes links to:

- *TIMSS 2015 Assessment Frameworks* presents the mathematics and science assessment frameworks that describe in some detail the major content and cognitive domains to be assessed at the fourth and eighth grades as well as the framework describing the types of learning situations and factors that will be investigated via the questionnaire data and an overview of the assessment design.
- *TIMSS 2015 Encyclopedia: Education Policy and Curriculum in Mathematics and Science* describes national contexts for mathematics and science teaching and learning. It contains selected data about the countries' curricula together with a chapter written by each participant summarizing the structure of its education system, the mathematics and science curricula and instruction in primary and secondary grades, the teacher education requirements, and the types of examinations and assessments employed.
- *Methods and Procedures in TIMSS 2015* describes the methods and procedures used to develop, implement, and analyze the results from the TIMSS 2015 assessments.

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TIMSS 2015

CHAPTER 1: STUDENT ACHIEVEMENT

TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
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International Mathematics Achievement

East Asian Countries Top Achievers at Fourth Grade in Mathematics

TIMSS 2015 Mathematics has achievement results for **49** countries at the fourth grade.

Singapore 618 Hong Kong SAR 615
Korea 608
Chinese Taipei 597 Japan 593

23 The gap between the East Asian countries and the next highest country was 23 in 2015, unchanged from 2011.

Northern Ireland 570
Russian Federation 564
Norway 549 Ireland 547 England 546
Belgium-Flemish 546 Kazakhstan 544
Portugal 541 United States 539 Denmark 539
Lithuania 535 Finland 535 Poland 535
Netherlands 530 Hungary 529 Czech Republic 528
Bulgaria 524 Cyprus 523 Germany 522 Slovenia 520
Sweden 519 Serbia 518 Australia 517 Canada 511 Italy 507
Spain 505 Croatia 502 Slovak Republic 498 New Zealand 491
France 488 Turkey 483 Georgia 463 Chile 459 United Arab Emirates 452
Bahrain 451 Qatar 439 Iran 431 Oman 425 Indonesia 397
Jordan 388 Saudi Arabia 383 Morocco 377 South Africa 376 Kuwait 353

Please see Exhibit 1.3 for statistically significant differences.

Trends at Fourth Grade Show Increases in Mathematics Achievement Around the World

Trends 2011-2015: 41 Countries

21 Countries Higher Average Achievement
Bahrain, Chinese Taipei, Croatia, Czech Republic, Georgia, Hong Kong SAR, Hungary, Ireland, Japan, Kazakhstan, Morocco, Oman, Portugal, Qatar, Russian Federation, Singapore, Slovenia, Spain, Sweden, Turkey, United Arab Emirates

15 Countries Same Average Achievement
Australia, Belgium (Flemish), Chile, Denmark, England, Iran, Italy, Korea, Lithuania, New Zealand, Northern Ireland, Norway, Serbia, Slovak Republic, the United States

5 Countries Lower Average Achievement
Finland, Germany, Kuwait, Netherlands, Saudi Arabia

Trends 1995-2015: 17 Countries

14 Countries Higher Average Achievement
Australia, Cyprus, England, Hong Kong SAR, Iran, Ireland, Japan, Korea, New Zealand, Norway, Portugal, Singapore, Slovenia, the United States

1 Country Same Average Achievement
Hungary

2 Countries Lower Average Achievement
Czech Republic, Netherlands

In TIMSS 2015 Boys Had Higher Mathematics Achievement in More Countries Than Girls.

Of the 49 TIMSS 2015 Countries:

- Boys had higher achievement in **18** countries, with an average difference of **9** points.
- Girls had higher achievement in **8** countries, with an average difference of **18** points.
- **23** countries had no difference between boys and girls in average mathematics achievement.

1995 1999 2003 2007 2011 2015

Mathematics Achievement Trends by Gender Show Little Change

Trends 2011-2015: 41 Countries

- In both assessments boys had higher achievement in **11** countries, compared to **2** for girls.
- **16** countries had no difference in average mathematics achievement between boys and girls.

Trends 1995-2015: 17 Countries

- In 1995, boys had higher achievement in **7** countries, with an average achievement advantage of **8** points.
- In 2015, boys had higher achievement in **9** countries, with an average achievement advantage of **8** points.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA TIMSS & PIRLS International Study Center
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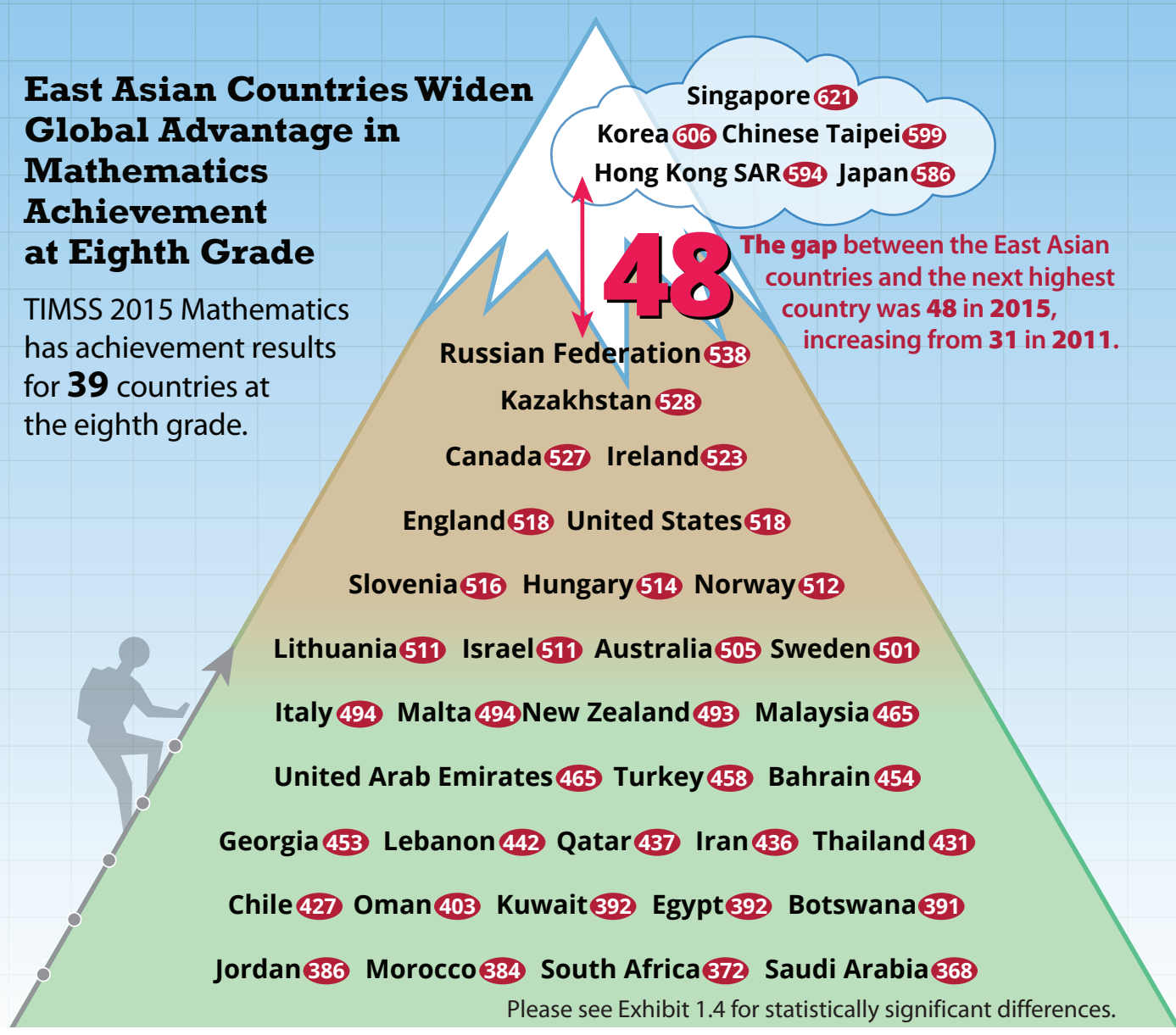
International Mathematics Achievement

East Asian Countries Widen Global Advantage in Mathematics Achievement at Eighth Grade

TIMSS 2015 Mathematics has achievement results for **39** countries at the eighth grade.



Please see Exhibit 1.4 for statistically significant differences.

Trends at Eighth Grade Show Increases in Mathematics Achievement Around the World

Trends 2011-2015: 34 Countries

18 Countries Higher Average Achievement
Bahrain, Chile, Georgia, Iran, Japan, Kazakhstan, Lithuania, Malaysia, Morocco, Norway, Oman, Qatar, Singapore, Slovenia, South Africa, Sweden, United Arab Emirates, the United States

13 Countries Same Average Achievement
Australia, Botswana, England, Hong Kong SAR, Hungary, Israel, Italy, Korea, Lebanon, New Zealand, Russian Federation, Thailand, Turkey

3 Countries Lower Average Achievement
Chinese Taipei, Jordan, Saudi Arabia

Trends 1995-2015: 16 Countries

9 Countries Higher Average Achievement
England, Hong Kong SAR, Iran, Korea, Lithuania, Russian Federation, Singapore, Slovenia, the United States

4 Countries Same Average Achievement
Australia, Ireland, Japan, New Zealand

3 Countries Lower Average Achievement
Hungary, Norway, Sweden

Little Difference in Mathematics Achievement by Gender

Of the 39 TIMSS 2015 Countries:

- **26** countries had no difference between girls and boys in higher achievement.
- Girls had higher achievement in **7** countries, with an average difference of **17** points.
- Boys had higher average achievement in **6** countries, with an average achievement of **9** points.

Mathematics Achievement Trends by Gender Show Little Change

Trends 2011-2015: 34 Countries

For **25** of the **34** countries with comparable data in 2011 and 2015, the gender **gaps did not change**.

- **16** countries had no difference in average mathematics achievement between girls and boys in either 2011 or 2015.
- In **7** countries girls had higher achievement in both assessments compared to **2** countries for boys.

Trends 1995-2015: 16 Countries

- In 1995, boys had higher achievement than girls in **4** countries with an average achievement advantage of **17** points. There was no difference in **12** countries.
- In 2015, boys had higher achievement than girls in **3** countries, with an average achievement advantage of **9** points. Girls had higher achievement in Singapore, with an average achievement advantage of **10** points.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

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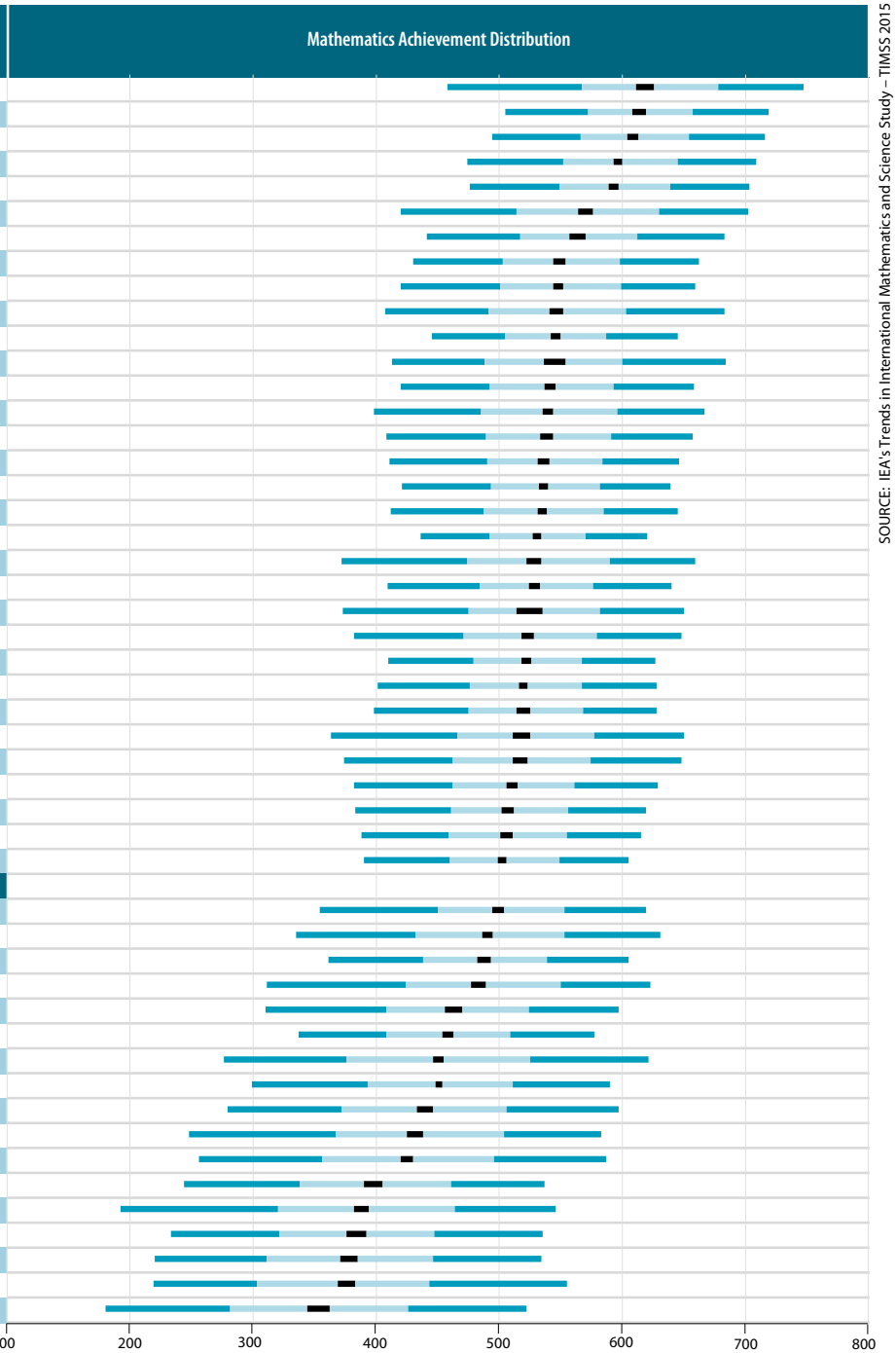
Lynch School of Education, Boston College

Exhibit 1.1: Distribution of Mathematics Achievement

Country	Average Scale Score
[2] Singapore	618 (3.8) ▲
† Hong Kong SAR	615 (2.9) ▲
Korea, Rep. of	608 (2.2) ▲
Chinese Taipei	597 (1.9) ▲
Japan	593 (2.0) ▲
‡ Northern Ireland	570 (2.9) ▲
Russian Federation	564 (3.4) ▲
Norway (5)	549 (2.5) ▲
Ireland	547 (2.1) ▲
England	546 (2.8) ▲
† Belgium (Flemish)	546 (2.1) ▲
Kazakhstan	544 (4.5) ▲
[2] Portugal	541 (2.2) ▲
[2] † United States	539 (2.3) ▲
[2] † Denmark	539 (2.7) ▲
[2] Lithuania	535 (2.5) ▲
Finland	535 (2.0) ▲
Poland	535 (2.1) ▲
† Netherlands	530 (1.7) ▲
Hungary	529 (3.2) ▲
Czech Republic	528 (2.2) ▲
Bulgaria	524 (5.3) ▲
Cyprus	523 (2.7) ▲
Germany	522 (2.0) ▲
Slovenia	520 (1.9) ▲
[2] Sweden	519 (2.8) ▲
[3] Serbia	518 (3.5) ▲
Australia	517 (3.1) ▲
[1] [2] † Canada	511 (2.3) ▲
[2] Italy	507 (2.6) ▲
[2] Spain	505 (2.5) ▲
Croatia	502 (1.8)
TIMSS Scale Centerpoint	500
Slovak Republic	498 (2.5)
New Zealand	491 (2.3) ▼
France	488 (2.9) ▼
Turkey	483 (3.1) ▼
[1] Georgia	463 (3.6) ▼
Chile	459 (2.4) ▼
United Arab Emirates	452 (2.4) ▼
[2] Bahrain	451 (1.6) ▼
Qatar	439 (3.4) ▼
Iran, Islamic Rep. of	431 (3.2) ▼
Oman	425 (2.5) ▼
Indonesia	397 (3.7) ▼
Jordan	388 (3.1) ▼
ψ Saudi Arabia	383 (4.1) ▼
Morocco	377 (3.4) ▼
South Africa (5)	376 (3.5) ▼
ψ Kuwait	353 (4.6) ▼



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Note: Seven countries and 1 benchmarking entity participated in the TIMSS Numeracy assessment: Bahrain, Indonesia, Iran, Jordan, Kuwait, Morocco, and South Africa as well as Buenos Aires. Except for Jordan and South Africa, they also participated in the TIMSS fourth grade assessment and their mathematics achievement results are based on an average of both assessments.

The TIMSS achievement scale was established in 1995 based on the combined achievement distribution of all countries that participated in TIMSS 1995. To provide a point of reference for country comparisons, the scale centerpoint of 500 was located at the mean of the combined achievement distribution. The units of the scale were chosen so that 100 scale score points corresponded to the standard deviation of the distribution.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.
See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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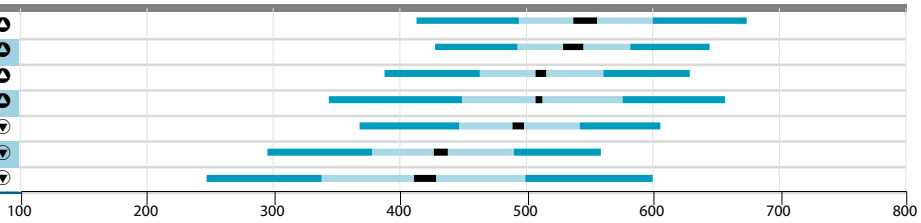
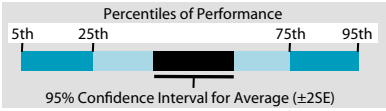
Exhibit 1.1: Distribution of Mathematics Achievement (Continued)

Country	Average Scale Score	Mathematics Achievement Distribution
Benchmarking Participants		
[1] Florida, US	546 (4.7) ▲	
‡ Quebec, Canada	536 (4.0) ▲	
Ontario, Canada	512 (2.3) ▲	
Dubai, UAE	511 (1.4) ▲	
Norway (4)	493 (2.3) ▼	
Buenos Aires, Argentina	432 (2.9) ▼	
[2] ψ Abu Dhabi, UAE	419 (4.7) ▼	



▲ Country average significantly higher than the centerpoint of the TIMSS 4th grade scale

▼ Country average significantly lower than the centerpoint of the TIMSS 4th grade scale



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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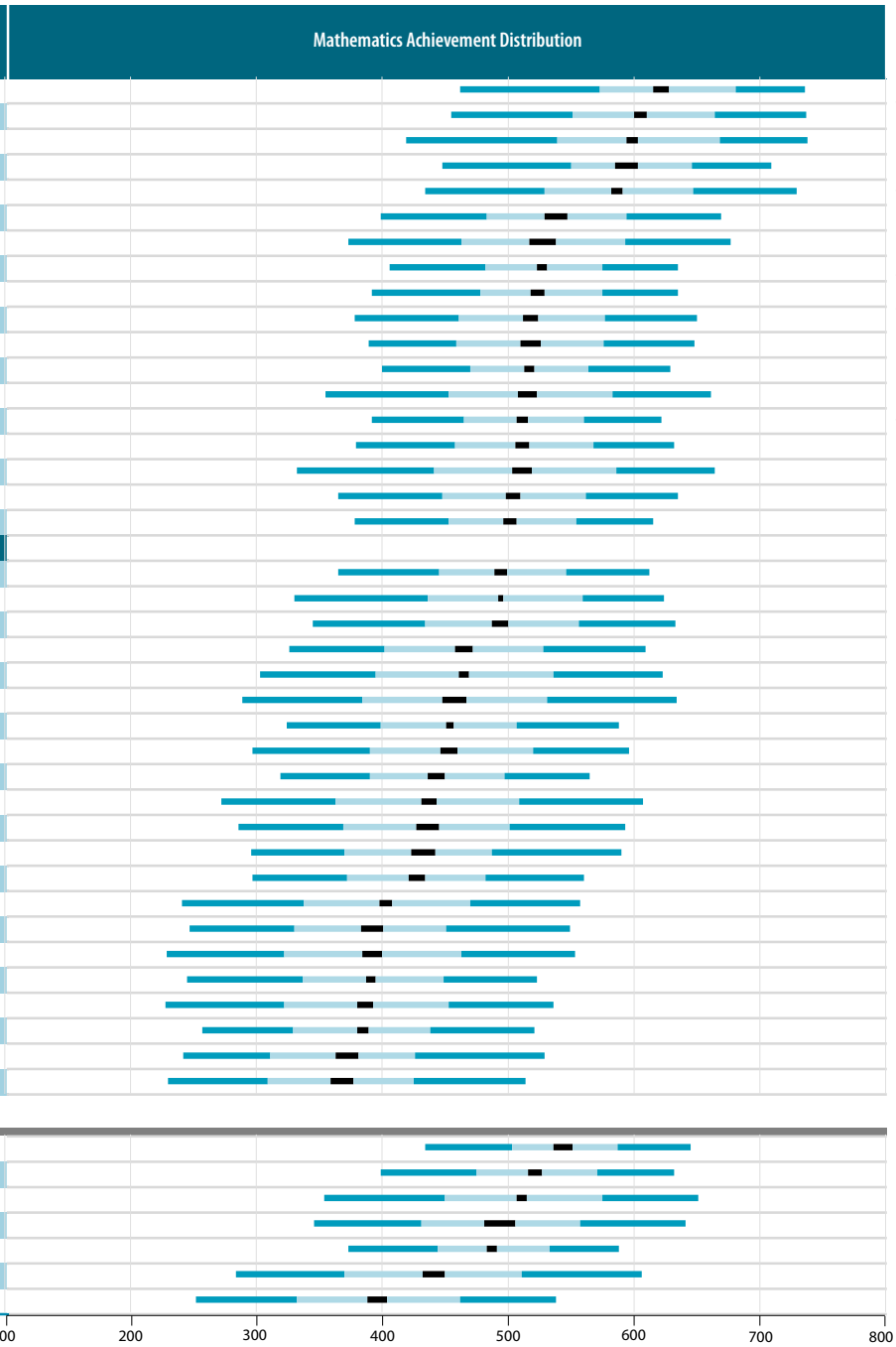
Exhibit 1.2: Distribution of Mathematics Achievement

Country	Average Scale Score
[2] Singapore	621 (3.2) ▲
Korea, Rep. of	606 (2.6) ▲
Chinese Taipei	599 (2.4) ▲
Hong Kong SAR	594 (4.6) ▲
Japan	586 (2.3) ▲
Russian Federation	538 (4.7) ▲
Kazakhstan	528 (5.3) ▲
[1] † Canada	527 (2.2) ▲
Ireland	523 (2.7) ▲
† United States	518 (3.1) ▲
England	518 (4.2) ▲
Slovenia	516 (2.1) ▲
Hungary	514 (3.8) ▲
Norway (9)	512 (2.3) ▲
[2] Lithuania	511 (2.8) ▲
[3] Israel	511 (4.1) ▲
Australia	505 (3.1)
Sweden	501 (2.8)
TIMSS Scale Centerpoint	500
[2] Italy	494 (2.5) ▼
Malta	494 (1.0) ▼
† New Zealand	493 (3.4) ▼
Malaysia	465 (3.6) ▼
United Arab Emirates	465 (2.0) ▼
Turkey	458 (4.7) ▼
Bahrain	454 (1.4) ▼
[1] [2] Georgia	453 (3.4) ▼
Lebanon	442 (3.6) ▼
ψ Qatar	437 (3.0) ▼
ψ Iran, Islamic Rep. of	436 (4.6) ▼
Thailand	431 (4.8) ▼
ψ Chile	427 (3.2) ▼
ψ Oman	403 (2.4) ▼
ψ Kuwait	392 (4.6) ▼
ψ Egypt	392 (4.1) ▼
ψ Botswana (9)	391 (2.0) ▼
ж Jordan	386 (3.2) ▼
ж Morocco	384 (2.3) ▼
ж South Africa (9)	372 (4.5) ▼
ж Saudi Arabia	368 (4.6) ▼
Benchmarking Participants	
‡ Quebec, Canada	543 (3.9) ▲
Ontario, Canada	522 (2.9) ▲
Dubai, UAE	512 (2.1) ▲
[1] Florida, US	493 (6.4)
Norway (8)	487 (2.0) ▼
Abu Dhabi, UAE	442 (4.7) ▼
† ж Buenos Aires, Argentina	396 (4.2) ▼



▲ Country average significantly higher than the centerpoint of the TIMSS 8th grade scale

▼ Country average significantly lower than the centerpoint of the TIMSS 8th grade scale

Percentiles of Performance
5th 25th 75th 95th
95% Confidence Interval for Average (±2SE)

The TIMSS achievement scale was established in 1995 based on the combined achievement distribution of all countries that participated in TIMSS 1995. To provide a point of reference for country comparisons, the scale centerpoint of 500 was located at the mean of the combined achievement distribution. The units of the scale were chosen so that 100 scale score points corresponded to the standard deviation of the distribution.

ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 1.3: Multiple Comparisons of Average Mathematics Achievement

Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

Country	Average Scale Score	Singapore	Hong Kong SAR	Korea, Rep. of	Chinese Taipei	Japan	Northern Ireland	Russian Federation	Norway (5)	Ireland	England	Belgium (Flemish)	Kazakhstan	Portugal	United States	Denmark	Lithuania	Finland	Poland	Netherlands	Hungary	Czech Republic	Bulgaria	Cyprus	Germany	Slovenia	Sweden	Serbia	Australia	Canada	Italy
Singapore	618 (3.8)			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Hong Kong SAR	615 (2.9)				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Korea, Rep. of	608 (2.2)	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Chinese Taipei	597 (1.9)	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Japan	593 (2.0)	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Northern Ireland	570 (2.9)	▼	▼	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Russian Federation	564 (3.4)	▼	▼	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Norway (5)	549 (2.5)	▼	▼	▼	▼	▼	▼	▼						▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Ireland	547 (2.1)	▼	▼	▼	▼	▼	▼	▼						▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
England	546 (2.8)	▼	▼	▼	▼	▼	▼	▼									▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Belgium (Flemish)	546 (2.1)	▼	▼	▼	▼	▼	▼	▼							▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Kazakhstan	544 (4.5)	▼	▼	▼	▼	▼	▼	▼												▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Portugal	541 (2.2)	▼	▼	▼	▼	▼	▼	▼	▼	▼								▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
United States	539 (2.3)	▼	▼	▼	▼	▼	▼	▼	▼	▼		▼								▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Denmark	539 (2.7)	▼	▼	▼	▼	▼	▼	▼	▼	▼		▼								▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Lithuania	535 (2.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼										▲		▲	▲	▲	▲	▲	▲	▲	▲
Finland	535 (2.0)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▼						▲		▲		▲	▲	▲	▲	▲	▲	▲	▲
Poland	535 (2.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▼								▲		▲	▲	▲	▲	▲	▲	▲	▲
Netherlands	530 (1.7)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▼						▲	▲	▲	▲	▲	▲	▲	▲
Hungary	529 (3.2)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼									▲	▲	▲	▲	▲	▲	▲
Czech Republic	528 (2.2)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼						▲	▲	▲	▲	▲	▲	▲
Bulgaria	524 (5.3)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼														▲	▲
Cyprus	523 (2.7)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼										▲	▲
Germany	522 (2.0)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼								▲	▲
Slovenia	520 (1.9)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼								▲	▲
Sweden	519 (2.8)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼								▲	▲
Serbia	518 (3.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼									▲
Australia	517 (3.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼									▲
Canada	511 (2.3)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				
Italy	507 (2.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		
Spain	505 (2.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		
Croatia	502 (1.8)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	
Slovak Republic	498 (2.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
New Zealand	491 (2.3)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
France	488 (2.9)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Turkey	483 (3.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Georgia	463 (3.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Chile	459 (2.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
United Arab Emirates	452 (2.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Bahrain	451 (1.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Qatar	439 (3.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Iran, Islamic Rep. of	431 (3.2)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Oman	425 (2.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Indonesia	397 (3.7)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Jordan	388 (3.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Saudi Arabia	383 (4.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Morocco	377 (3.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
South Africa (5)	376 (3.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Kuwait	353 (4.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Benchmarking Participants																															
Florida, US	546 (4.7)	▼	▼	▼	▼	▼	▼	▼									▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Quebec, Canada	536 (4.0)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼												▲	▲	▲	▲	▲	▲	▲	▲
Ontario, Canada	512 (2.3)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼					
Dubai, UAE	511 (1.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼					
Norway (4)	493 (2.3)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Buenos Aires, Argentina	432 (2.9)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Abu Dhabi, UAE	419 (4.7)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼

▲ Average achievement significantly higher than comparison country

▼ Average achievement significantly lower than comparison country

Significance tests were not adjusted for multiple comparisons. Five percent of the comparisons would be statistically significant by chance alone.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 1.3: Multiple Comparisons of Average Mathematics Achievement (Continued)

Country	Average Scale Score	Spain	Croatia	Slovak Republic	New Zealand	France	Turkey	Georgia	Chile	United Arab Emirates	Bahrain	Qatar	Iran, Islamic Rep. of	Oman	Indonesia	Jordan	Saudi Arabia	Morocco	South Africa (5)	Kuwait	Benchmarking Participants	Florida, US	Quebec, Canada	Ontario, Canada	Dubai, UAE	Norway (4)	Buenos Aires, Argentina	Abu Dhabi, UAE
Singapore	618 (3.8)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Hong Kong SAR	615 (2.9)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Korea, Rep. of	608 (2.2)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Chinese Taipei	597 (1.9)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Japan	593 (2.0)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Northern Ireland	570 (2.9)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Russian Federation	564 (3.4)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Norway (5)	549 (2.5)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲			▲	▲	▲	▲	▲	▲
Ireland	547 (2.1)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲			▲	▲	▲	▲	▲	▲
England	546 (2.8)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲			▲	▲	▲	▲	▲	▲
Belgium (Flemish)	546 (2.1)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲			▲	▲	▲	▲	▲	▲
Kazakhstan	544 (4.5)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲				▲	▲	▲	▲	▲
Portugal	541 (2.2)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲				▲	▲	▲	▲	▲
United States	539 (2.3)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲				▲	▲	▲	▲	▲
Denmark	539 (2.7)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲				▲	▲	▲	▲	▲
Lithuania	535 (2.5)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
Finland	535 (2.0)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
Poland	535 (2.1)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
Netherlands	530 (1.7)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
Hungary	529 (3.2)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
Czech Republic	528 (2.2)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
Bulgaria	524 (5.3)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
Cyprus	523 (2.7)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▲	▲	▲	▲	▲
Germany	522 (2.0)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▲	▲	▲	▲	▲
Slovenia	520 (1.9)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▲	▲	▲	▲	▲
Sweden	519 (2.8)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼		▲	▲	▲	▲
Serbia	518 (3.5)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼			▲	▲	▲
Australia	517 (3.1)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼			▲	▲	▲
Canada	511 (2.3)		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼			▲	▲	▲
Italy	507 (2.6)			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼			▲	▲	▲
Spain	505 (2.5)			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼		▲	▲	▲
Croatia	502 (1.8)				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▲	▲	▲
Slovak Republic	498 (2.5)	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼		▲	▲
New Zealand	491 (2.3)	▼	▼	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼		▲	▲
France	488 (2.9)	▼	▼	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼		▲	▲
Turkey	483 (3.1)	▼	▼	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▲	▲
Georgia	463 (3.6)	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▲	▲
Chile	459 (2.4)	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▲	▲
United Arab Emirates	452 (2.4)	▼	▼	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▲	▲
Bahrain	451 (1.6)	▼	▼	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▲	▲
Qatar	439 (3.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼		▲
Iran, Islamic Rep. of	431 (3.2)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼		▲
Oman	425 (2.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼		
Indonesia	397 (3.7)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼			▲	▲	▲	▲		▼	▼	▼	▼	▼	▼	▼
Jordan	388 (3.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲	▲	▲		▼	▼	▼	▼	▼	▼	▼
Saudi Arabia	383 (4.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼					▲		▼	▼	▼	▼	▼	▼	▼
Morocco	377 (3.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲		▼	▼	▼	▼	▼	▼	▼
South Africa (5)	376 (3.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲		▼	▼	▼	▼	▼	▼	▼
Kuwait	353 (4.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼			▼	▼	▼	▼	▼	▼	▼
Benchmarking Participants																												
Florida, US	546 (4.7)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲				▲	▲	▲	▲	▲
Quebec, Canada	536 (4.0)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲				▲	▲	▲	▲	▲
Ontario, Canada	512 (2.3)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼			▲	▲	▲
Dubai, UAE	511 (1.4)		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼			▲	▲	▲
Norway (4)	493 (2.3)	▼	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼		▲	▲
Buenos Aires, Argentina	432 (2.9)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼		▲
Abu Dhabi, UAE	419 (4.7)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▼	

▲ Average achievement significantly higher than comparison country

▼ Average achievement significantly lower than comparison country

Significance tests were not adjusted for multiple comparisons. Five percent of the comparisons would be statistically significant by chance alone.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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Exhibit 1.4: Multiple Comparisons of Average Mathematics Achievement

Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

Country	Average Scale Score	Singapore	Korea, Rep. of	Chinese Taipei	Hong Kong SAR	Japan	Russian Federation	Kazakhstan	Canada	Ireland	United States	England	Slovenia	Hungary	Norway (9)	Lithuania	Israel	Australia	Sweden	Italy	Malta	New Zealand	Malaysia	United Arab Emirates	Turkey	Bahrain	Georgia	Lebanon	Qatar	Iran, Islamic Rep. of	Thailand
Singapore	621 (3.2)		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Korea, Rep. of	606 (2.6)	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Chinese Taipei	599 (2.4)	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Hong Kong SAR	594 (4.6)	▼	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Japan	586 (2.3)	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Russian Federation	538 (4.7)	▼	▼	▼	▼	▼			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Kazakhstan	528 (5.3)	▼	▼	▼	▼	▼							▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Canada	527 (2.2)	▼	▼	▼	▼	▼	▼				▲		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Ireland	523 (2.7)	▼	▼	▼	▼	▼	▼						▲		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
United States	518 (3.1)	▼	▼	▼	▼	▼	▼		▼									▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
England	518 (4.2)	▼	▼	▼	▼	▼	▼											▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Slovenia	516 (2.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼								▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Hungary	514 (3.8)	▼	▼	▼	▼	▼	▼	▼	▼										▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Norway (9)	512 (2.3)	▼	▼	▼	▼	▼	▼	▼	▼	▼									▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Lithuania	511 (2.8)	▼	▼	▼	▼	▼	▼	▼	▼	▼									▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Israel	511 (4.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼									▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Australia	505 (3.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼							▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Sweden	501 (2.8)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲		▲	▲	▲	▲	▲	▲	▲	▲	▲
Italy	494 (2.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼					▲	▲	▲	▲	▲	▲	▲	▲	▲
Malta	494 (1.0)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲	▲	▲	▲	▲	▲	▲	▲	▲
New Zealand	493 (3.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼					▲	▲	▲	▲	▲	▲	▲	▲	▲
Malaysia	465 (3.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲	▲	▲	▲	▲	▲
United Arab Emirates	465 (2.0)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲	▲	▲	▲	▲	▲
Turkey	458 (4.7)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼						▲	▲	▲	▲
Bahrain	454 (1.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲	▲	▲	▲
Georgia	453 (3.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				▲	▲	▲	▲
Lebanon	442 (3.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				
Qatar	437 (3.0)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				
Iran, Islamic Rep. of	436 (4.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				
Thailand	431 (4.8)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼				
Chile	427 (3.2)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		
Oman	403 (2.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Kuwait	392 (4.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Egypt	392 (4.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Botswana (9)	391 (2.0)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Jordan	386 (3.2)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Morocco	384 (2.3)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
South Africa (9)	372 (4.5)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Saudi Arabia	368 (4.6)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
Benchmarking Participants																															
Quebec, Canada	543 (3.9)	▼	▼	▼	▼	▼		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Ontario, Canada	522 (2.9)	▼	▼	▼	▼	▼	▼								▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Dubai, UAE	512 (2.1)	▼	▼	▼	▼	▼	▼	▼	▼	▼									▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Florida, US	493 (6.4)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼						▲	▲	▲	▲	▲	▲	▲	▲	▲
Norway (8)	487 (2.0)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼		▲	▲	▲	▲	▲	▲	▲	▲	▲
Abu Dhabi, UAE	442 (4.7)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼					
Buenos Aires, Argentina	396 (4.2)	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼

▲ Average achievement significantly higher than comparison country

▼ Average achievement significantly lower than comparison country

Significance tests were not adjusted for multiple comparisons. Five percent of the comparisons would be statistically significant by chance alone.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 1.4: Multiple Comparisons of Average Mathematics Achievement (Continued)

Country	Average Scale Score	Chile	Oman	Kuwait	Egypt	Botswana (9)	Jordan	Morocco	South Africa (9)	Saudi Arabia	Benchmarking Participants	Quebec, Canada	Ontario, Canada	Dubai, UAE	Florida, US	Norway (8)	Abu Dhabi, UAE	Buenos Aires, Argentina
Singapore	621 (3.2)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Korea, Rep. of	606 (2.6)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Chinese Taipei	599 (2.4)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Hong Kong SAR	594 (4.6)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Japan	586 (2.3)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲
Russian Federation	538 (4.7)	▲	▲	▲	▲	▲	▲	▲	▲	▲			▲	▲	▲	▲	▲	▲
Kazakhstan	528 (5.3)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
Canada	527 (2.2)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
Ireland	523 (2.7)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
United States	518 (3.1)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼			▲	▲	▲	▲
England	518 (4.2)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼			▲	▲	▲	▲
Slovenia	516 (2.1)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼			▲	▲	▲	▲
Hungary	514 (3.8)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼			▲	▲	▲	▲
Norway (9)	512 (2.3)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼		▲	▲	▲	▲
Lithuania	511 (2.8)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼		▲	▲	▲	▲
Israel	511 (4.1)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼		▲	▲	▲	▲
Australia	505 (3.1)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼			▲	▲	▲
Sweden	501 (2.8)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼		▲	▲	▲
Italy	494 (2.5)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼		▲	▲	▲
Malta	494 (1.0)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼		▲	▲	▲
New Zealand	493 (3.4)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼			▲	▲
Malaysia	465 (3.6)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▲	▲
United Arab Emirates	465 (2.0)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▲	▲
Turkey	458 (4.7)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▲	▲
Bahrain	454 (1.4)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▲	▲
Georgia	453 (3.4)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▲	▲
Lebanon	442 (3.6)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼		▲
Qatar	437 (3.0)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼		▲
Iran, Islamic Rep. of	436 (4.6)		▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼		▲
Thailand	431 (4.8)		▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼		▲
Chile	427 (3.2)		▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▼	▲
Oman	403 (2.4)	▼		▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼	▼	
Kuwait	392 (4.6)	▼	▼						▲	▲		▼	▼	▼	▼	▼	▼	
Egypt	392 (4.1)	▼	▼						▲	▲		▼	▼	▼	▼	▼	▼	
Botswana (9)	391 (2.0)	▼	▼					▲	▲	▲		▼	▼	▼	▼	▼	▼	
Jordan	386 (3.2)	▼	▼						▲	▲		▼	▼	▼	▼	▼	▼	▼
Morocco	384 (2.3)	▼	▼			▼			▲	▲		▼	▼	▼	▼	▼	▼	▼
South Africa (9)	372 (4.5)	▼	▼	▼	▼	▼	▼	▼				▼	▼	▼	▼	▼	▼	▼
Saudi Arabia	368 (4.6)	▼	▼	▼	▼	▼	▼	▼				▼	▼	▼	▼	▼	▼	▼
Benchmarking Participants																		
Quebec, Canada	543 (3.9)	▲	▲	▲	▲	▲	▲	▲	▲	▲			▲	▲	▲	▲	▲	▲
Ontario, Canada	522 (2.9)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼		▲	▲	▲	▲	▲
Dubai, UAE	512 (2.1)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼		▲	▲	▲	▲
Florida, US	493 (6.4)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼			▲	▲
Norway (8)	487 (2.0)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼			▲	▲
Abu Dhabi, UAE	442 (4.7)	▲	▲	▲	▲	▲	▲	▲	▲	▲		▼	▼	▼	▼	▼		▲
Buenos Aires, Argentina	396 (4.2)	▼					▲	▲	▲	▲		▼	▼	▼	▼	▼	▼	

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

▲ Average achievement significantly higher than comparison country

▼ Average achievement significantly lower than comparison country

Significance tests were not adjusted for multiple comparisons. Five percent of the comparisons would be statistically significant by chance alone.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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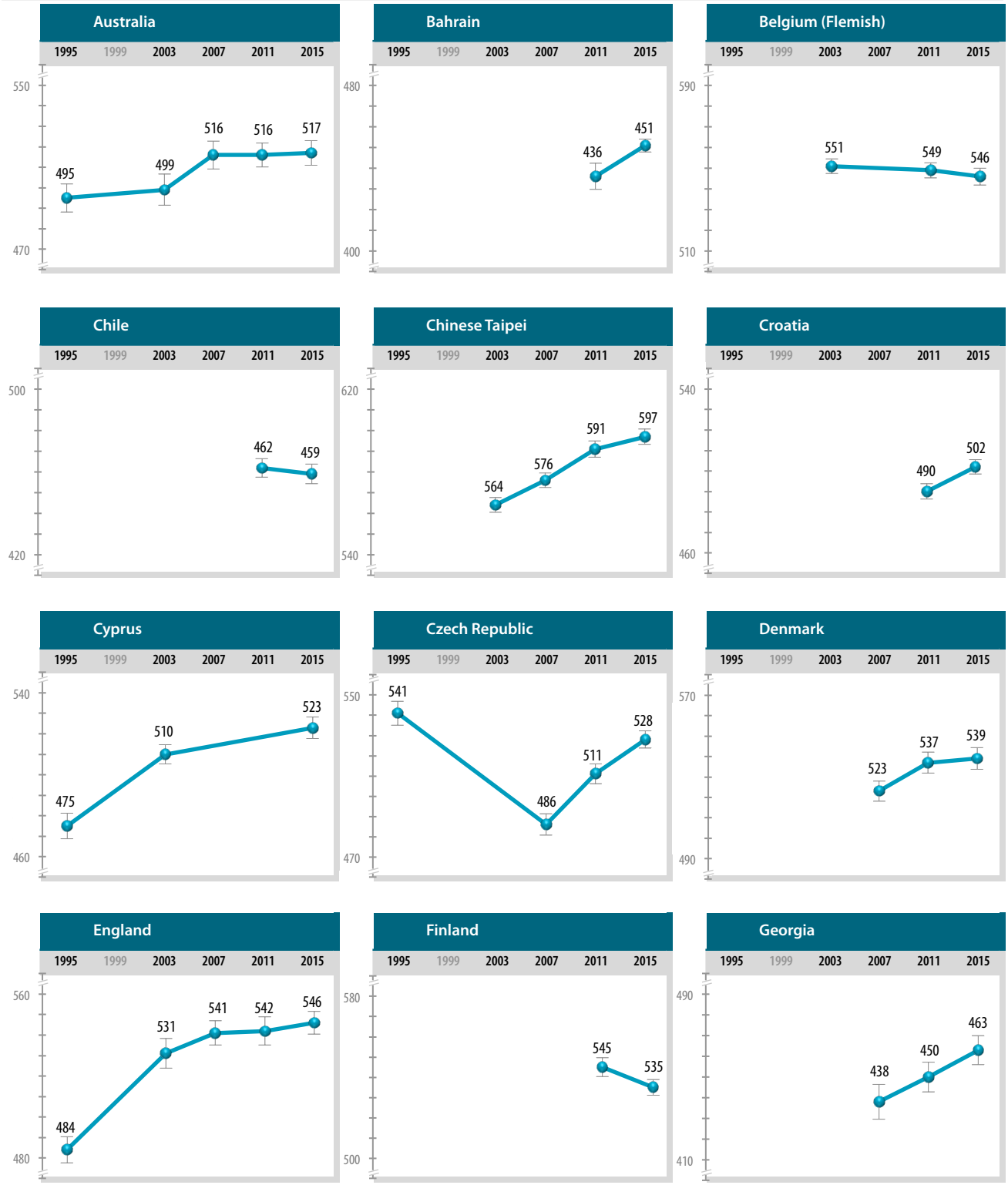
Exhibit 1.5: Trends in Mathematics Achievement◊

Displays changes in achievement for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The same scale is used for each country (10-point intervals), but the part of the scale shown differs according to each country's average achievement. The accompanying table (Exhibit 1.7) provides details, including statistical significance.



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

◊No fourth grade assessment in 1999.
Scale interval is 10 points for each country, but the part of the scale shown differs according to each country's average achievement. The gray bars represent the 95% confidence interval.

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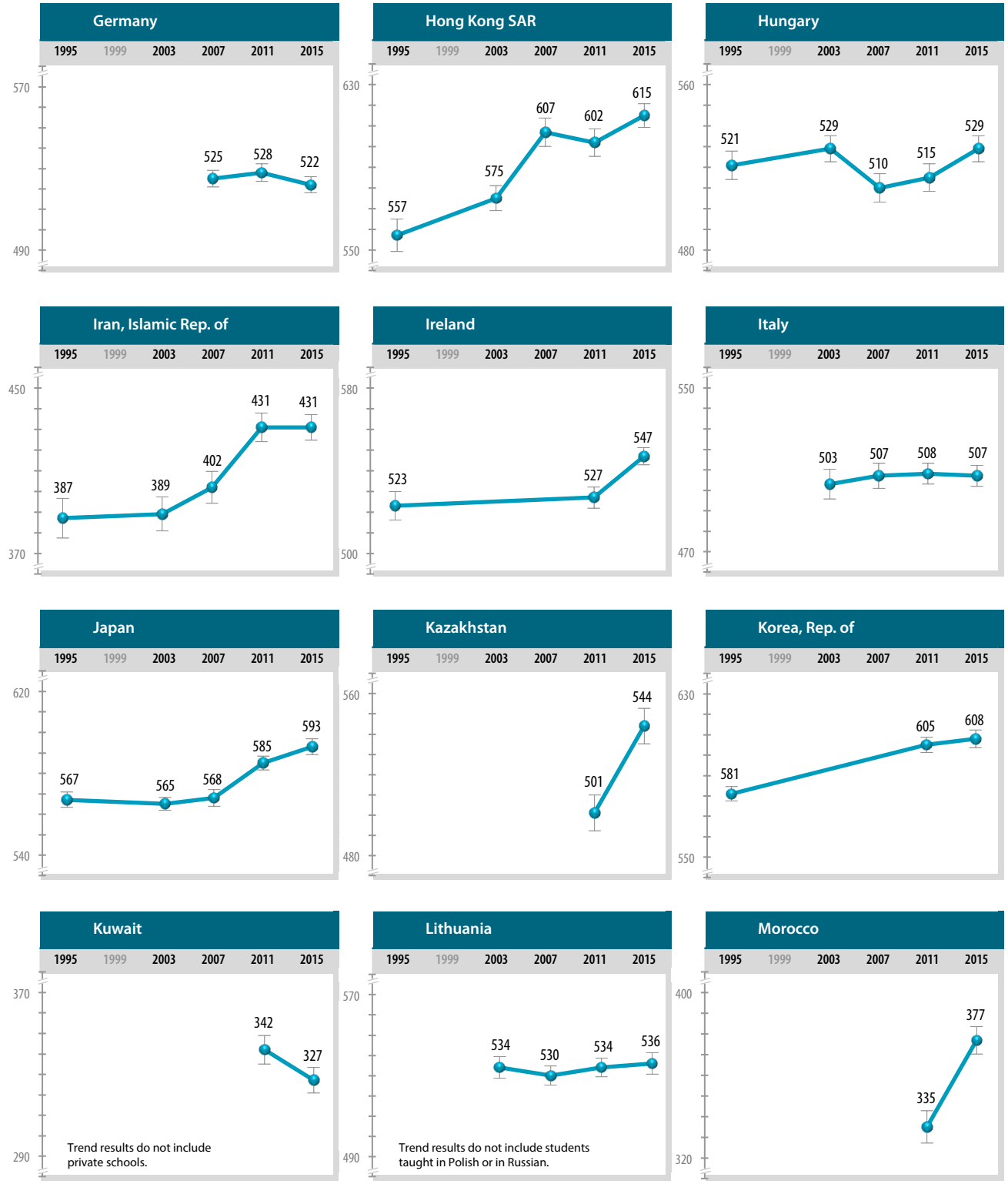
Exhibit 1.5: Trends in Mathematics Achievement◊ (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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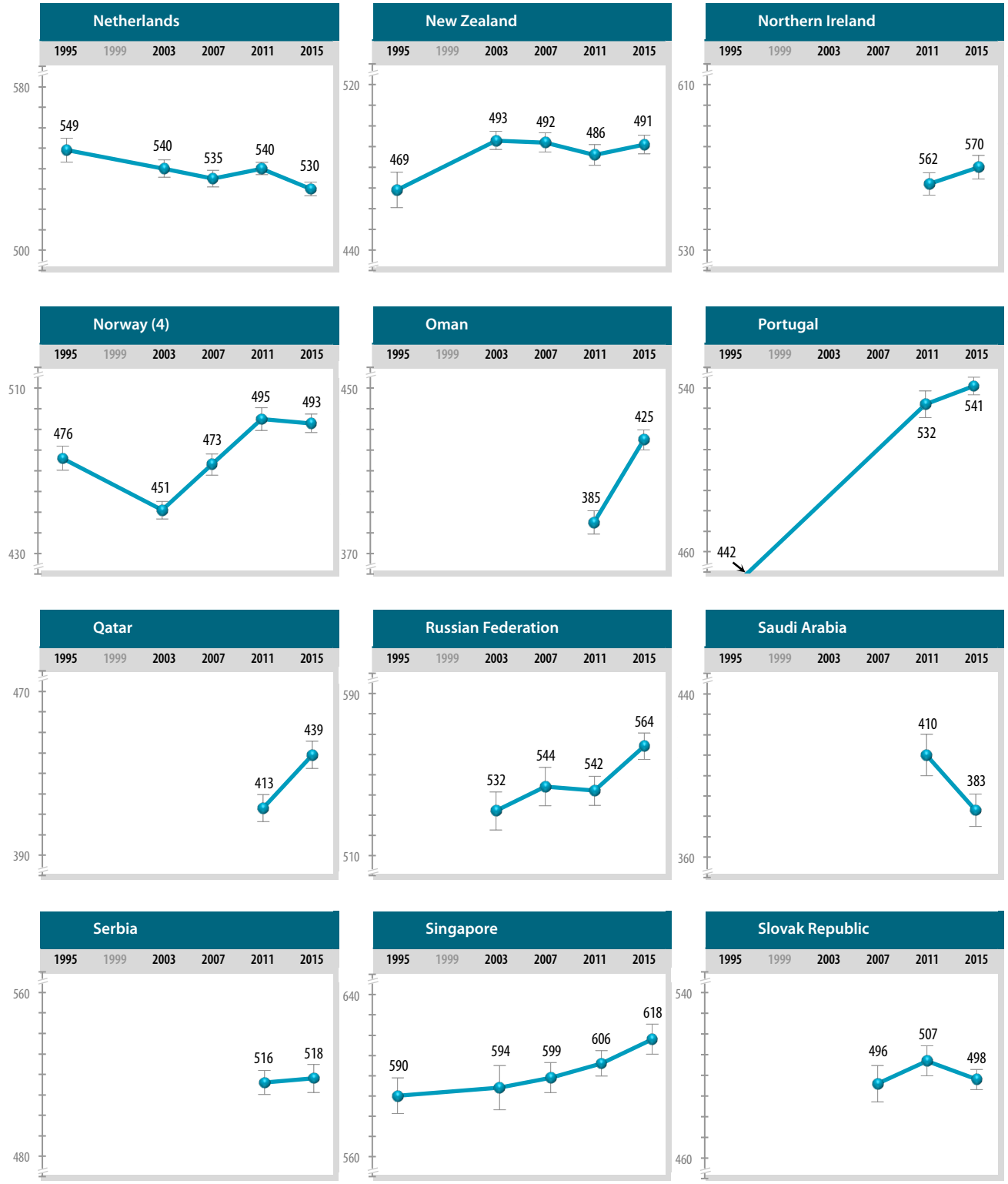
Exhibit 1.5: Trends in Mathematics Achievement◊ (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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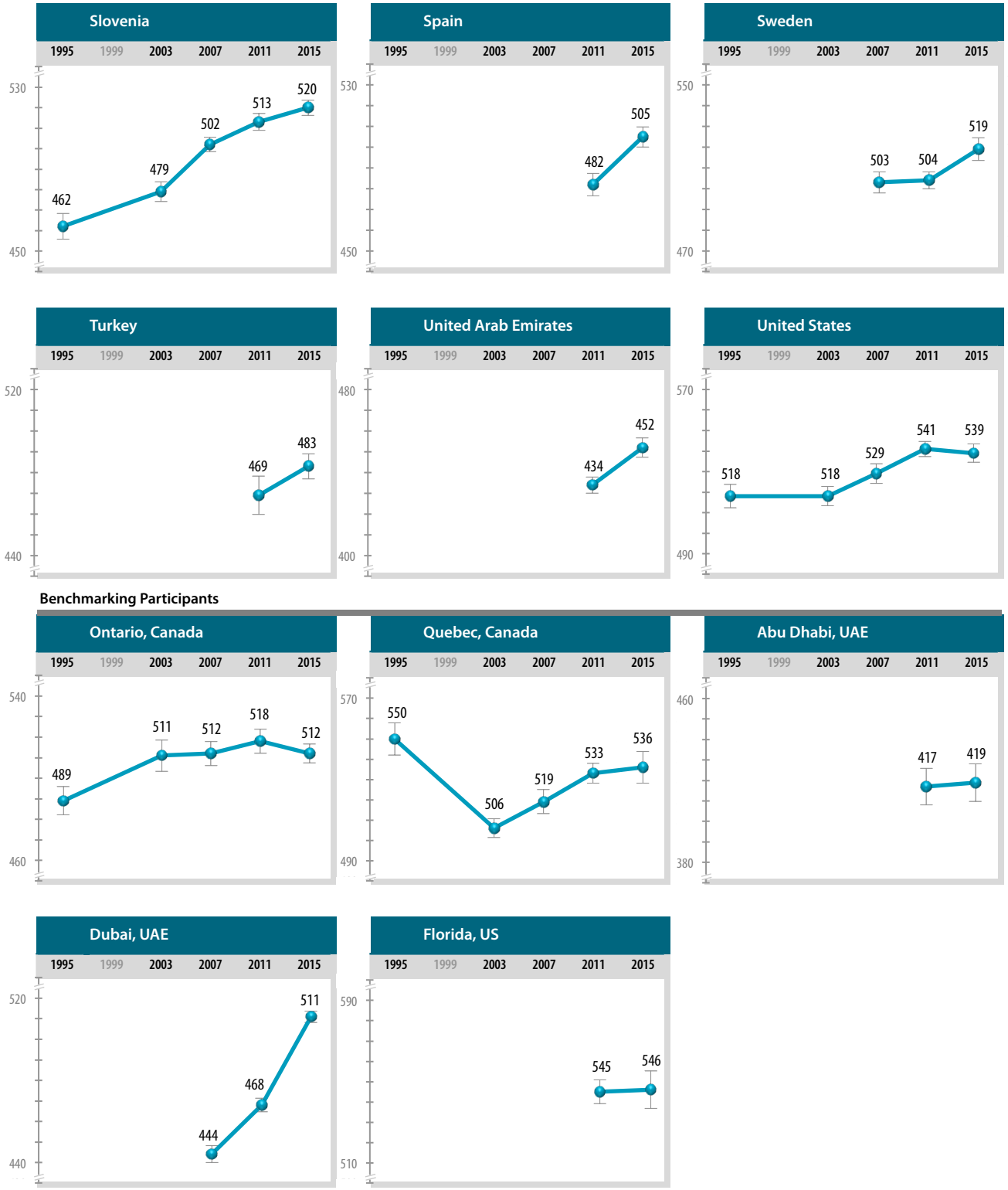
Exhibit 1.5: Trends in Mathematics Achievement◊ (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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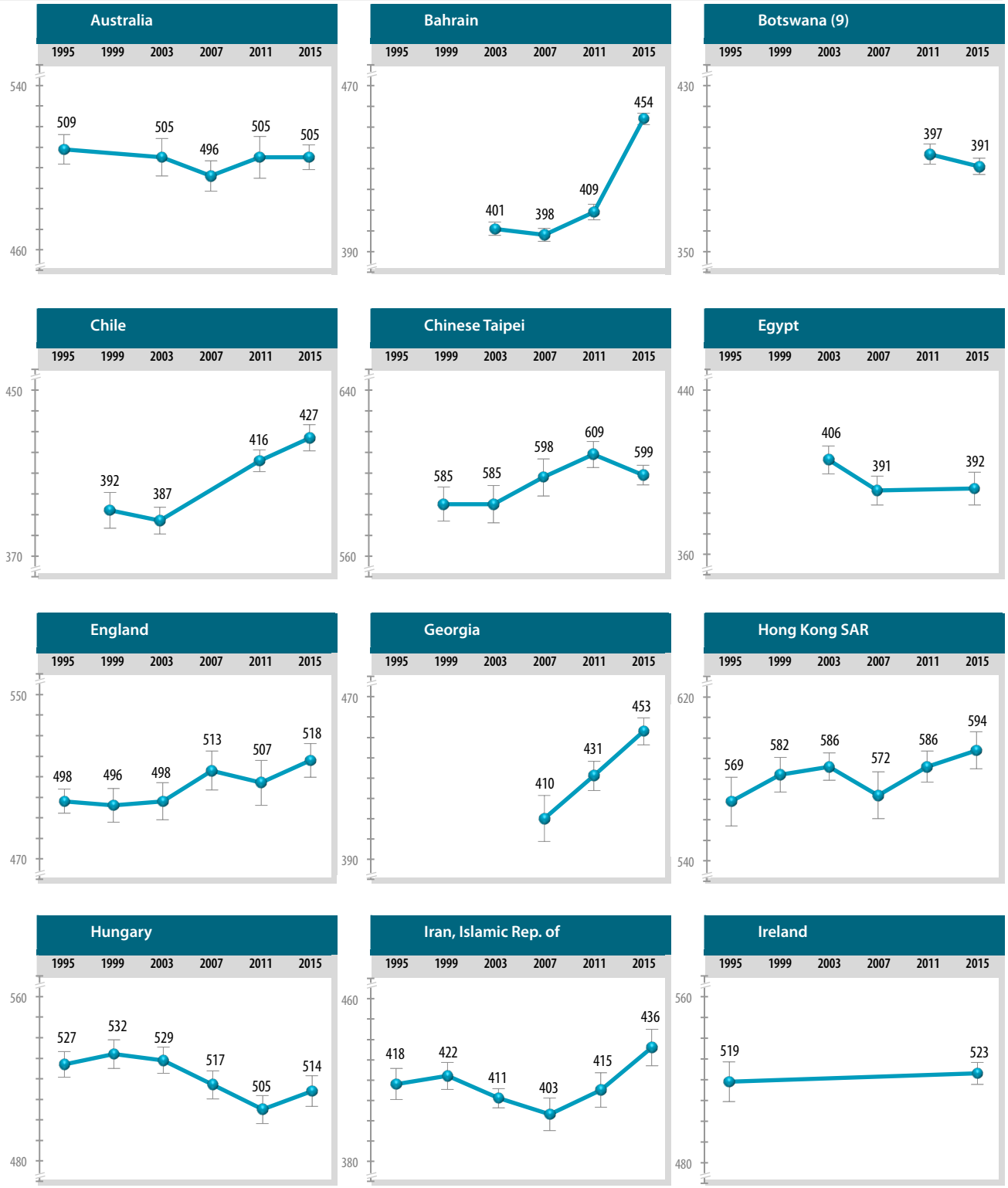
Exhibit 1.6: Trends in Mathematics Achievement

Displays changes in achievement for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The same scale is used for each country (10-point intervals), but the part of the scale shown differs according to each country's average achievement. The accompanying table (Exhibit 1.8) provides details, including statistical significance.



Scale interval is 10 points for each country, but the part of the scale shown differs according to each country's average achievement. The gray bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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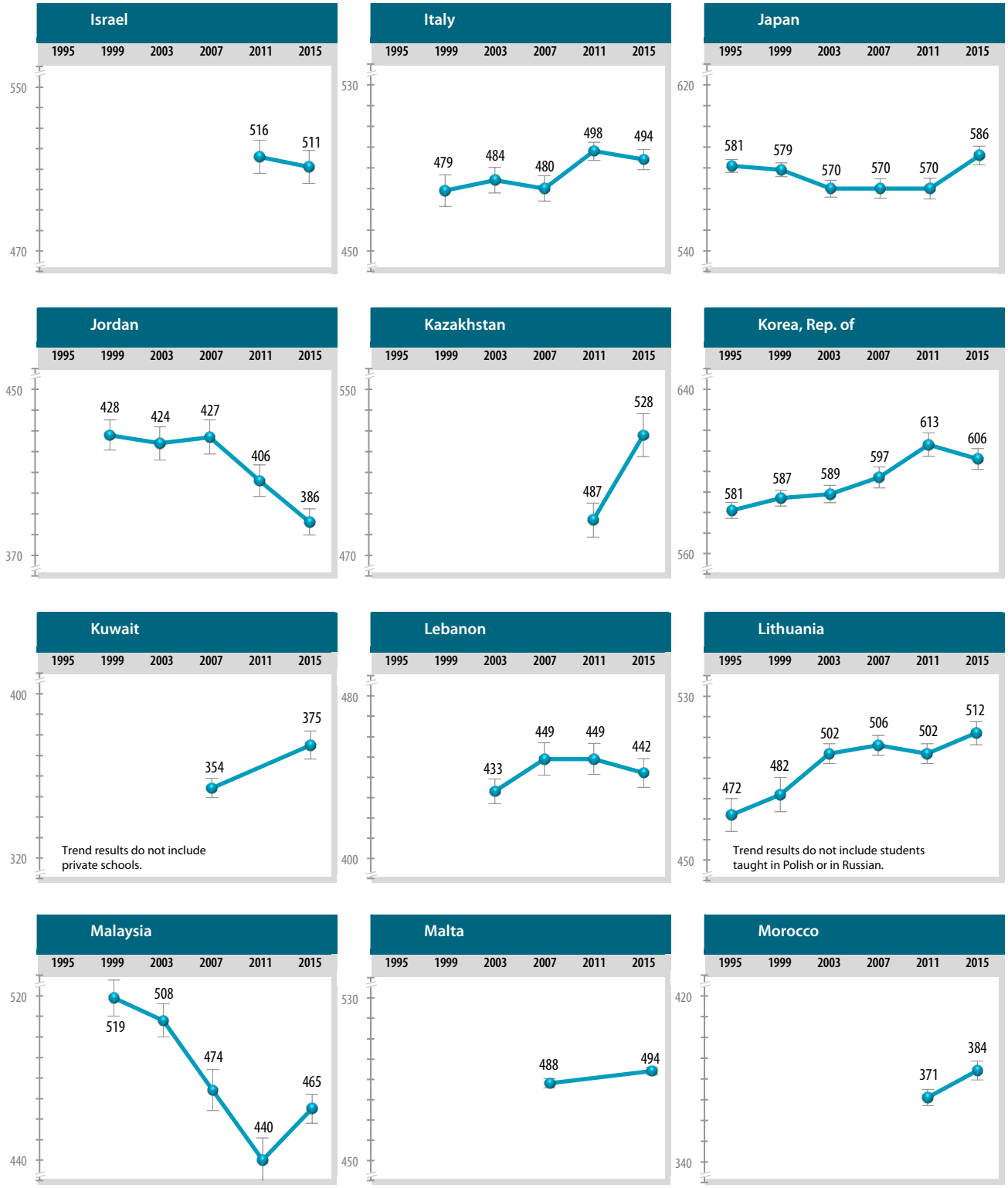
Exhibit 1.6: Trends in Mathematics Achievement (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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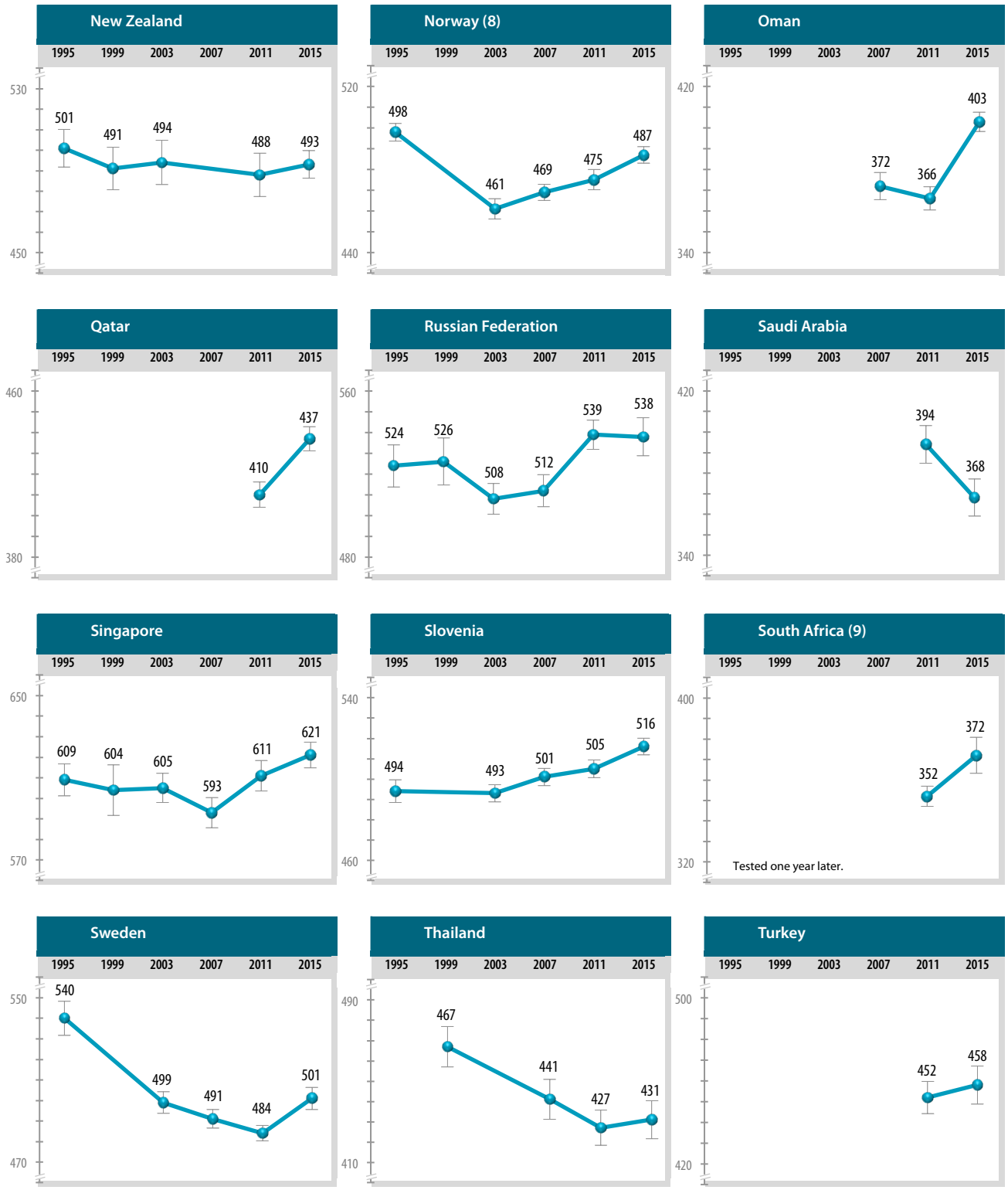
Exhibit 1.6: Trends in Mathematics Achievement (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 1.6: Trends in Mathematics Achievement (Continued)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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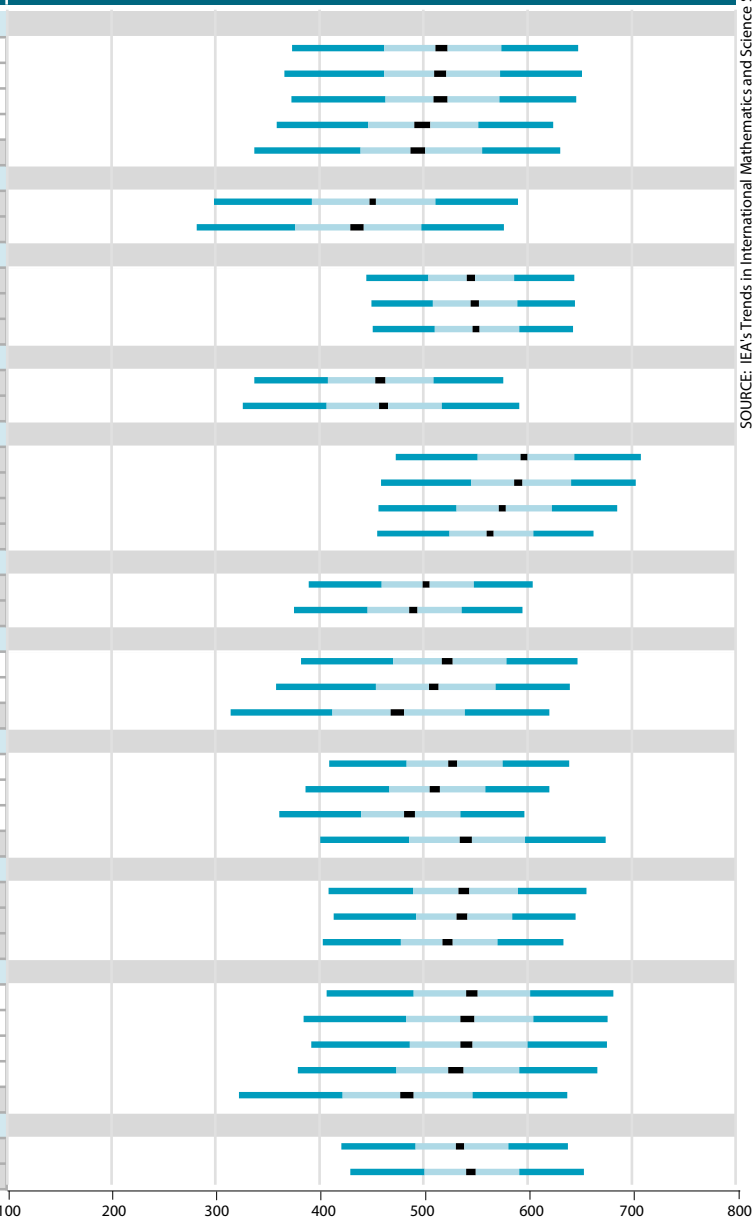
Exhibit 1.7: Differences in Mathematics Achievement Across Assessment Years

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

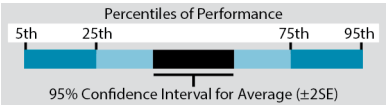
Country	Average Scale Score	Differences Between Years			
		2011	2007	2003	1995
Australia					
2015	517 (3.1)	1	1	19 ▲	23 ▲
2011	516 (3.0)		0	17 ▲	21 ▲
2007	516 (3.5)			17 ▲	22 ▲
† 2003	499 (3.9)				4
‡ 1995	495 (3.5)				
Bahrain					
2 2015	451 (1.6)	15 ▲			
2011	436 (3.2)				
Belgium (Flemish)					
† 2015	546 (2.1)	-4		-5	
2011	549 (1.9)			-1	
2 2003	551 (1.8)				
Chile					
2015	459 (2.4)	-3			
2011	462 (2.3)				
Chinese Taipei					
2015	597 (1.9)	5 ▲	21 ▲	33 ▲	
2011	591 (2.0)		15 ▲	27 ▲	
2007	576 (1.8)			12 ▲	
2003	564 (1.8)				
Croatia					
2015	502 (1.8)	12 ▲			
2 2011	490 (1.9)				
Cyprus					
2015	523 (2.7)			13 ▲	48 ▲
2003	510 (2.4)				35 ▲
1995	475 (3.2)				
Czech Republic					
2015	528 (2.2)	17 ▲	42 ▲		-12 ▼
2011	511 (2.5)		24 ▲		-30 ▼
2007	486 (2.7)				-54 ▼
1995	541 (3.0)				
Denmark					
2 † 2015	539 (2.7)	2	16 ▲		
2 2011	537 (2.6)		14 ▲		
† 2007	523 (2.5)				
England					
2015	546 (2.8)	4	5	15 ▲	62 ▲
2011	542 (3.5)		1	11 ▲	58 ▲
2007	541 (3.0)			10 ▲	57 ▲
† 2003	531 (3.7)				47 ▲
3 † 1995	484 (3.3)				
Finland					
2015	535 (2.0)	-10 ▼			
2011	545 (2.4)				

Mathematics Achievement Distribution



▲ More recent year significantly higher

▼ More recent year significantly lower



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish or in Russian.

⋇ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

⧓ Tested the same cohort of students as other countries, but later in the assessment year at the beginning of the next school year.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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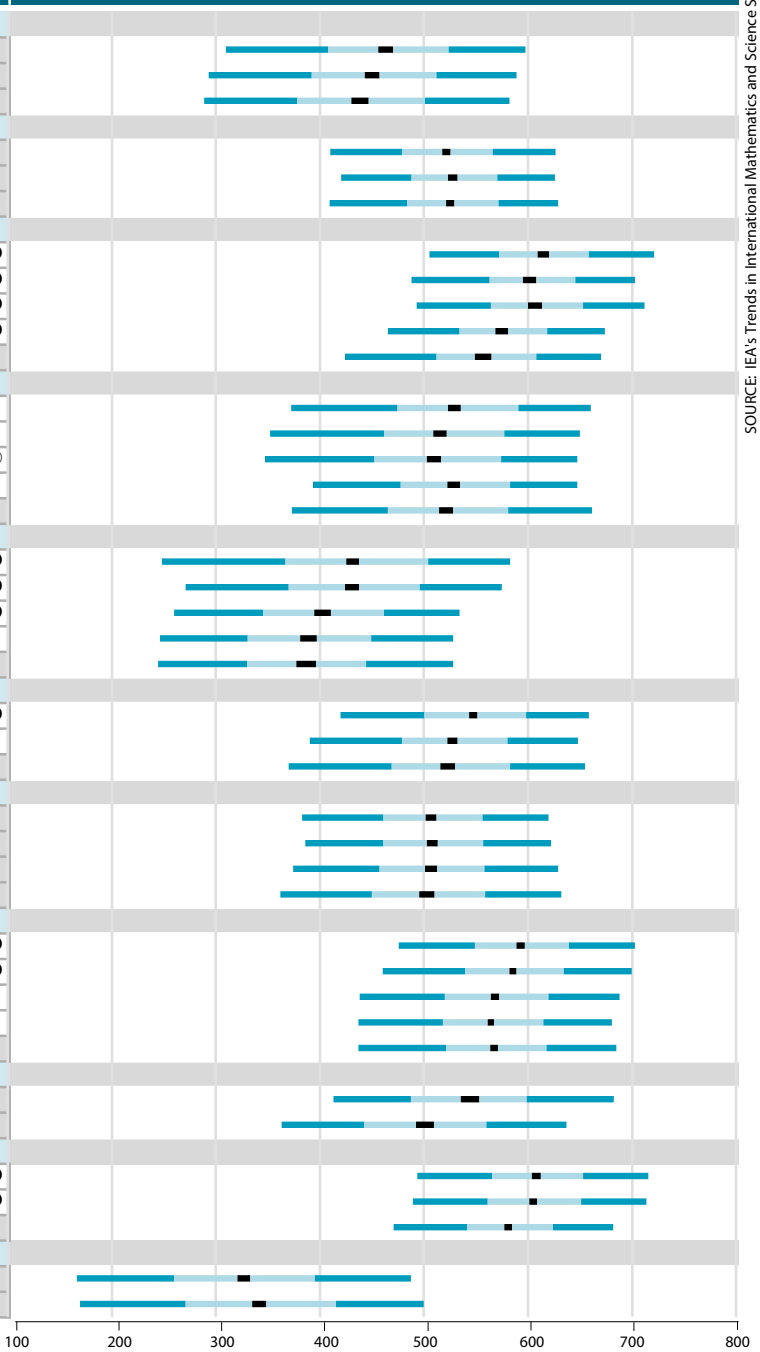
Exhibit 1.7: Differences in Mathematics Achievement Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Average Scale Score	Differences Between Years			
		2011	2007	2003	1995
Georgia					
[1] 2015	463 (3.6)	13 ▲	25 ▲		
[1] 2011	450 (3.7)		12 ▲		
[1] 2007	438 (4.3)				
Germany					
2015	522 (2.0)	-6 ▼	-4		
2011	528 (2.2)		3		
2007	525 (2.1)				
Hong Kong SAR					
† 2015	615 (2.9)	13 ▲	8	40 ▲	58 ▲
[2] 2011	602 (3.4)		-5	27 ▲	45 ▲
2007	607 (3.5)			32 ▲	50 ▲
† 2003	575 (3.1)				18 ▲
1995	557 (4.0)				
Hungary					
2015	529 (3.2)	14 ▲	19 ▲	1	8
2011	515 (3.4)		6	-13 ▼	-6
2007	510 (3.5)			-19 ▼	-12 ▼
[2] 2003	529 (3.2)				7
1995	521 (3.5)				
Iran, Islamic Rep. of					
2015	431 (3.2)	1	29 ▲	42 ▲	45 ▲
2011	431 (3.5)		28 ▲	42 ▲	44 ▲
2007	402 (4.0)			13 ▲	15 ▲
[2] 2003	389 (4.2)				2
1995	387 (4.9)				
Ireland					
2015	547 (2.1)	20 ▲			24 ▲
2011	527 (2.6)				5
[2] 1995	523 (3.5)				
Italy					
[2] 2015	507 (2.6)	-1	0	4	
2011	508 (2.6)		1	5	
2007	507 (3.1)			4	
2003	503 (3.7)				
Japan					
2015	593 (2.0)	7 ▲	25 ▲	28 ▲	26 ▲
2011	585 (1.7)		17 ▲	21 ▲	18 ▲
2007	568 (2.1)			4	1
2003	565 (1.6)				-3
1995	567 (1.9)				
Kazakhstan					
2015	544 (4.5)	43 ▲			
[2] 2011	501 (4.5)				
Korea, Rep. of					
2015	608 (2.2)	3			27 ▲
2011	605 (1.9)				24 ▲
[2] 1995	581 (1.8)				
Kuwait					
ψ 2015	327 (3.2)	-15 ▼			
[1] ж 2011	342 (3.6)				

Mathematics Achievement Distribution



▲ More recent year significantly higher

▼ More recent year significantly lower

Percentiles of Performance

5th 25th 75th 95th

95% Confidence Interval for Average (±2SE)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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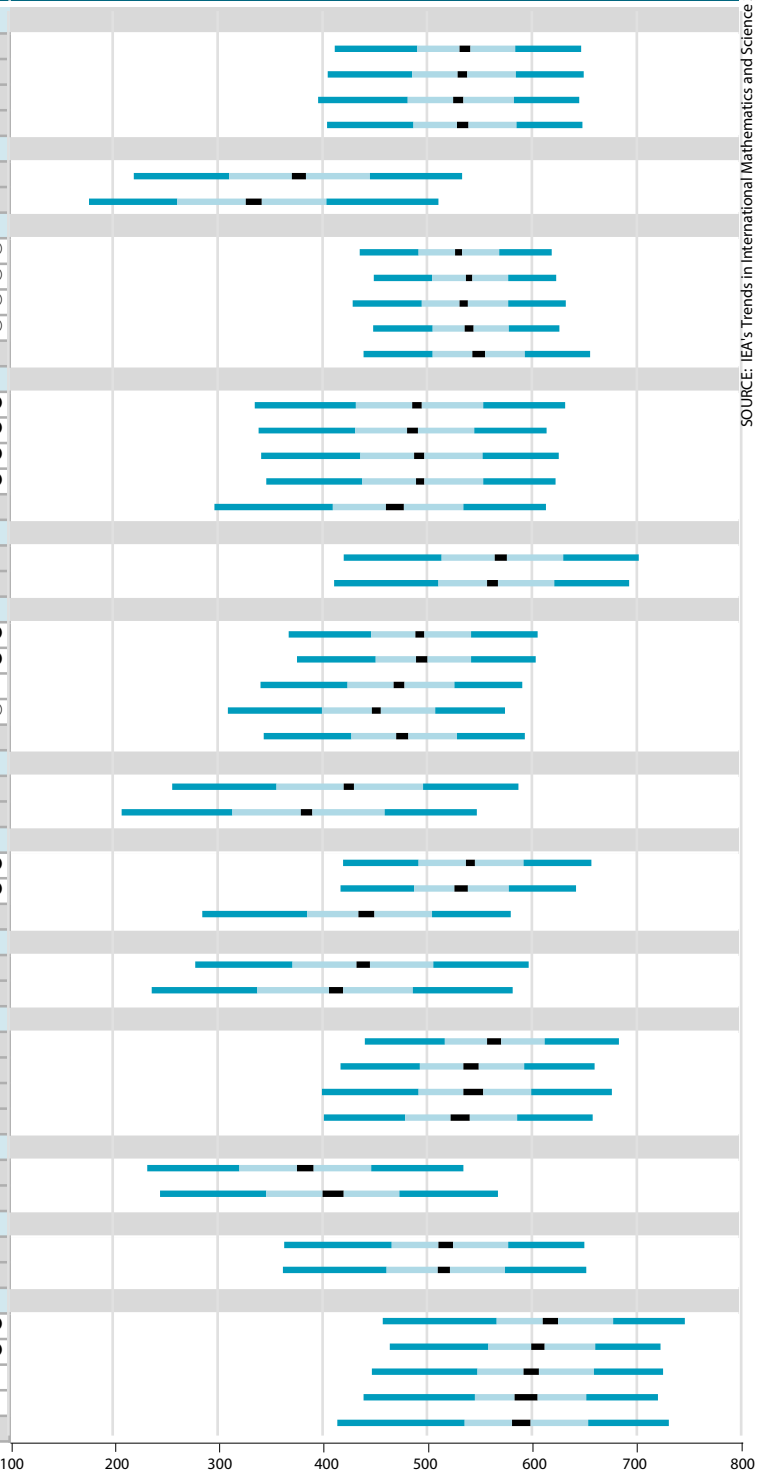
Exhibit 1.7: Differences in Mathematics Achievement Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

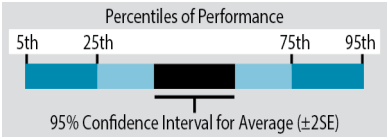
Country	Average Scale Score	Differences Between Years			
		2011	2007	2003	1995
Lithuania					
[2] 2015	536 (2.7)	3	7	2	
[1 2] 2011	534 (2.4)		4	0	
[1] 2007	530 (2.4)			-4	
[1] 2003	534 (2.7)				
Morocco					
2015	377 (3.4)	43 ▲			
ж 2011	335 (4.0)				
Netherlands					
† 2015	530 (1.7)	-10 ▼	-5	-11 ▼	-19 ▼
† 2011	540 (1.6)		5	0	-9 ▼
‡ 2007	535 (2.1)			-5	-14 ▼
† 2003	540 (2.2)				-9 ▼
‡ 1995	549 (3.0)				
New Zealand					
2015	491 (2.3)	4	-2	-3	21 ▲
2011	486 (2.6)		-6	-7 ▼	17 ▲
2007	492 (2.4)			-1	23 ▲
2003	493 (2.2)				24 ▲
1995	469 (4.4)				
Northern Ireland					
‡ 2015	570 (2.9)	8			
† 2011	562 (2.8)				
Norway (4)					
2015	493 (2.3)	-2	20 ▲	42 ▲	17 ▲
‡ 2011	495 (2.8)		22 ▲	44 ▲	19 ▲
2007	473 (2.6)			22 ▲	-3
2003	451 (2.2)				-25 ▼
1995	476 (3.0)				
Oman					
2015	425 (2.5)	41 ▲			
ψ 2011	385 (2.9)				
Portugal					
[2] 2015	541 (2.2)	9 ▲			99 ▲
2011	532 (3.3)				90 ▲
[2] 1995	442 (4.0)				
Qatar					
2015	439 (3.4)	26 ▲			
[2] 2011	413 (3.4)				
Russian Federation					
2015	564 (3.4)	22 ▲	20 ▲	32 ▲	
2011	542 (3.7)		-2	10	
2007	544 (4.9)			12	
[2] 2003	532 (4.8)				
Saudi Arabia					
ψ 2015	383 (4.1)	-27 ▼			
2011	410 (5.2)				
Serbia					
[3] 2015	518 (3.5)	2			
[2] 2011	516 (3.0)				
Singapore					
[2] 2015	618 (3.8)	12 ▲	18 ▲	23 ▲	27 ▲
[2] 2011	606 (3.2)		6	11	16 ▲
2007	599 (3.8)			5	9
2003	594 (5.6)				4
1995	590 (4.5)				

Mathematics Achievement Distribution



▲ More recent year significantly higher

▼ More recent year significantly lower



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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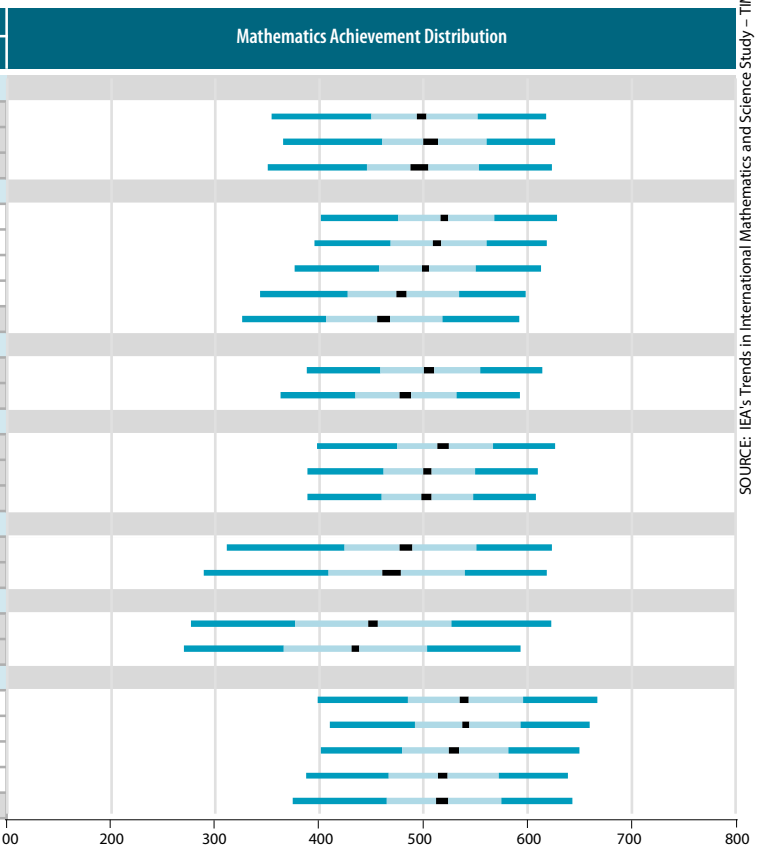
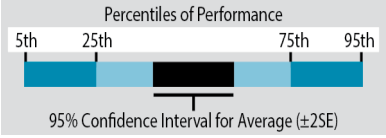
Exhibit 1.7: Differences in Mathematics Achievement Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Average Scale Score	Differences Between Years			
		2011	2007	2003	1995
Slovak Republic					
2015	498 (2.5)	-9	2		
2011	507 (3.7)		11		
2007	496 (4.5)				
Slovenia					
2015	520 (1.9)	7 ▲	18 ▲	41 ▲	58 ▲
2011	513 (2.1)		11 ▲	34 ▲	51 ▲
2007	502 (1.8)			23 ▲	40 ▲
2003	479 (2.5)				17 ▲
1995	462 (3.2)				
Spain					
[2] 2015	505 (2.5)	23 ▲			
2011	482 (2.8)				
Sweden					
[2] 2015	519 (2.8)	15 ▲	16 ▲		
2011	504 (2.1)		1		
2007	503 (2.6)				
Turkey					
2015	483 (3.1)	14 ▲			
2011	469 (4.7)				
United Arab Emirates					
2015	452 (2.4)	17 ▲			
2011	434 (2.0)				
United States					
[2] † 2015	539 (2.3)	-1	10 ▲	21 ▲	21 ▲
[2] 2011	541 (1.9)		12 ▲	22 ▲	23 ▲
[2] † 2007	529 (2.5)			11 ▲	11 ▲
† 2003	518 (2.4)				0
1995	518 (2.9)				



▲ More recent year significantly higher
▼ More recent year significantly lower



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

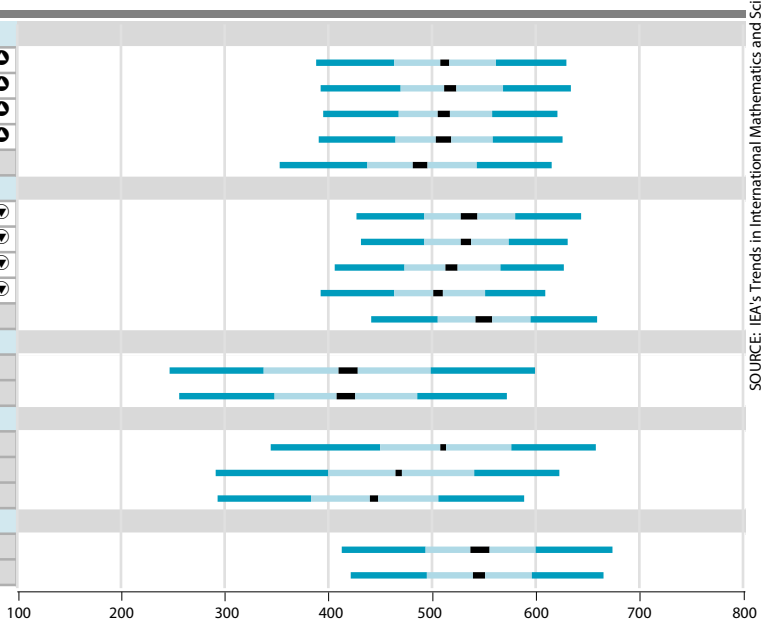
Downloaded from timss2015.org/download-center

Exhibit 1.7: Differences in Mathematics Achievement Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

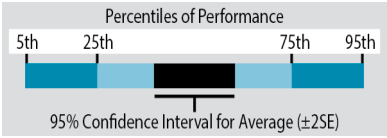
Country	Average Scale Score	Differences Between Years			
		2011	2007	2003	1995
Benchmarking Participants					
Ontario, Canada					
2015	512 (2.3)	-5	1	1	24 ▲
2011	518 (3.0)		6	7	29 ▲
[2] 2007	512 (3.0)			0	23 ▲
2003	511 (3.9)				23 ▲
[2] 1995	489 (3.5)				
Quebec, Canada					
‡ 2015	536 (4.0)	3	17 ▲	30 ▲	-14 ▼
2011	533 (2.5)		14 ▲	27 ▲	-17 ▼
[2] 2007	519 (3.0)			13 ▲	-31 ▼
2003	506 (2.4)				-44 ▼
1995	550 (4.1)				
Abu Dhabi, UAE					
[2] ψ 2015	419 (4.7)	2			
2011	417 (4.6)				
Dubai, UAE					
2015	511 (1.4)	43 ▲	66 ▲		
2011	468 (1.7)		24 ▲		
◆ ‡ 2007	444 (2.1)				
Florida, US					
[1] 2015	546 (4.7)	1			
[1 3] 2011	545 (3.0)				

Mathematics Achievement Distribution



▲ More recent year significantly higher

▼ More recent year significantly lower



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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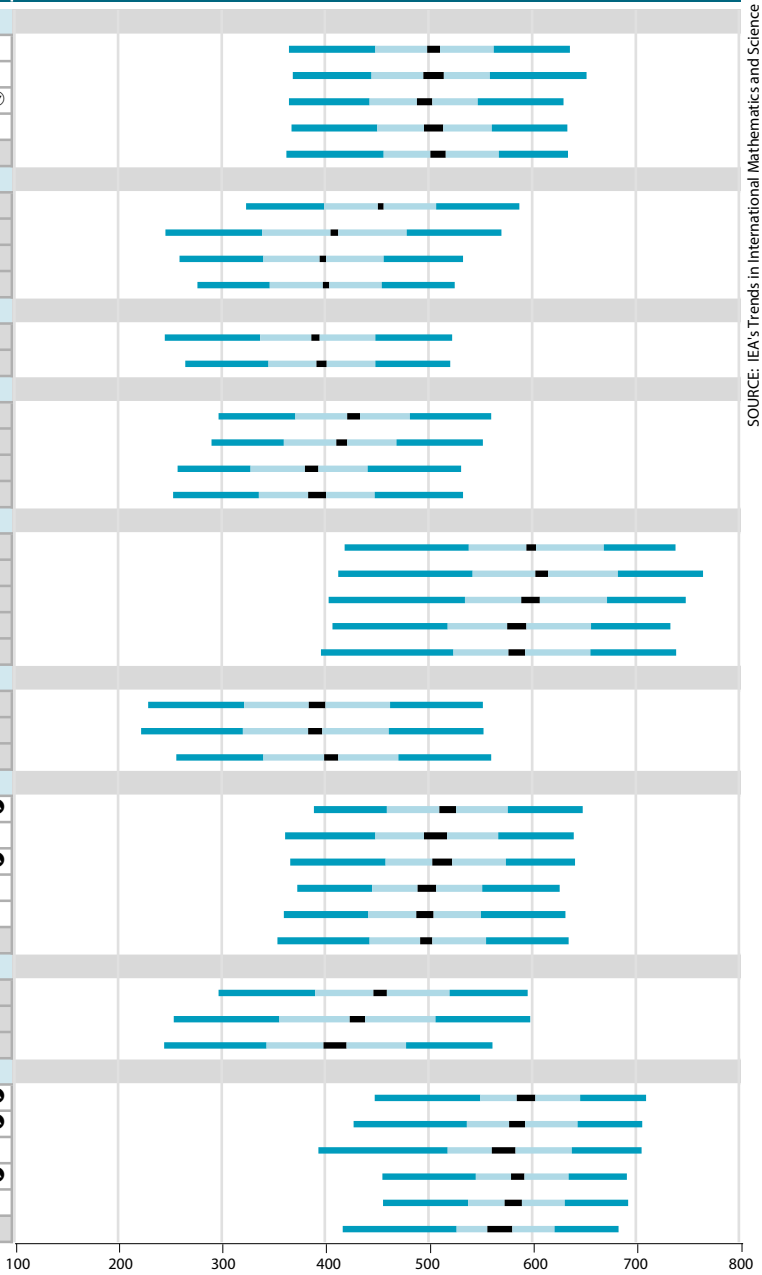
Exhibit 1.8: Differences in Mathematics Achievement Across Assessment Years

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

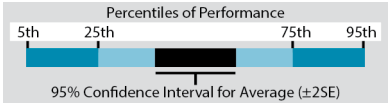
Country	Average Scale Score	Differences Between Years				
		2011	2007	2003	1999	1995
Australia						
2015	505 (3.1)	0	9	0		-4
2011	505 (5.2)		9	0		-4
2007	496 (3.8)			-8		-13 ▼
2003	505 (4.7)					-4
‡ 1995	509 (3.7)					
Bahrain						
2015	454 (1.4)	45 ▲	56 ▲	53 ▲		
ψ ◆◆ 2011	409 (1.9)		11 ▲	8 ▲		
2007	398 (1.6)			-3		
2003	401 (1.7)					
Botswana (9)						
ψ 2015	391 (2.0)	-6				
ψ 2011	397 (2.5)					
Chile						
ψ 2015	427 (3.2)	11 ▲		41 ▲	35 ▲	
2011	416 (2.7)			29 ▲	24 ▲	
2003	387 (3.3)				-6	
1999	392 (4.4)					
Chinese Taipei						
2015	599 (2.4)	-10 ▼	1	14 ▲	14 ▲	
2011	609 (3.2)		11	24 ▲	24 ▲	
2007	598 (4.6)			13 ▲	13 ▲	
2003	585 (4.6)				0	
1999	585 (4.2)					
Egypt						
ψ 2015	392 (4.1)		2	-14 ▼		
2007	391 (3.6)			-16 ▼		
2003	406 (3.5)					
England						
2015	518 (4.2)	11	5	20 ▲	22 ▲	21 ▲
‡ 2011	507 (5.6)		-7	8	10	9
† 2007	513 (4.9)			15 ▲	17 ▲	16 ▲
‡ 2003	498 (4.6)				2	1
† 1999	496 (4.2)					-1
3 † 1995	498 (3.0)					
Georgia						
1 2 2015	453 (3.4)	22 ▲	44 ▲			
1 2011	431 (3.7)		22 ▲			
1 2007	410 (5.8)					
Hong Kong SAR						
2015	594 (4.6)	9	22 ▲	8	12	25 ▲
2011	586 (3.9)		13	0	4	17 ▲
† 2007	572 (5.9)			-14 ▼	-10	4
† 2003	586 (3.4)				4	17 ▲
† 1999	582 (4.3)					13
1995	569 (6.1)					

Mathematics Achievement Distribution



▲ More recent year significantly higher

▼ More recent year significantly lower



Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish or in Russian. South Africa (9) tested one year later.

⁜ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.

◆◆ Tested the same cohort of students as other countries, but later in the assessment year at the beginning of the next school year.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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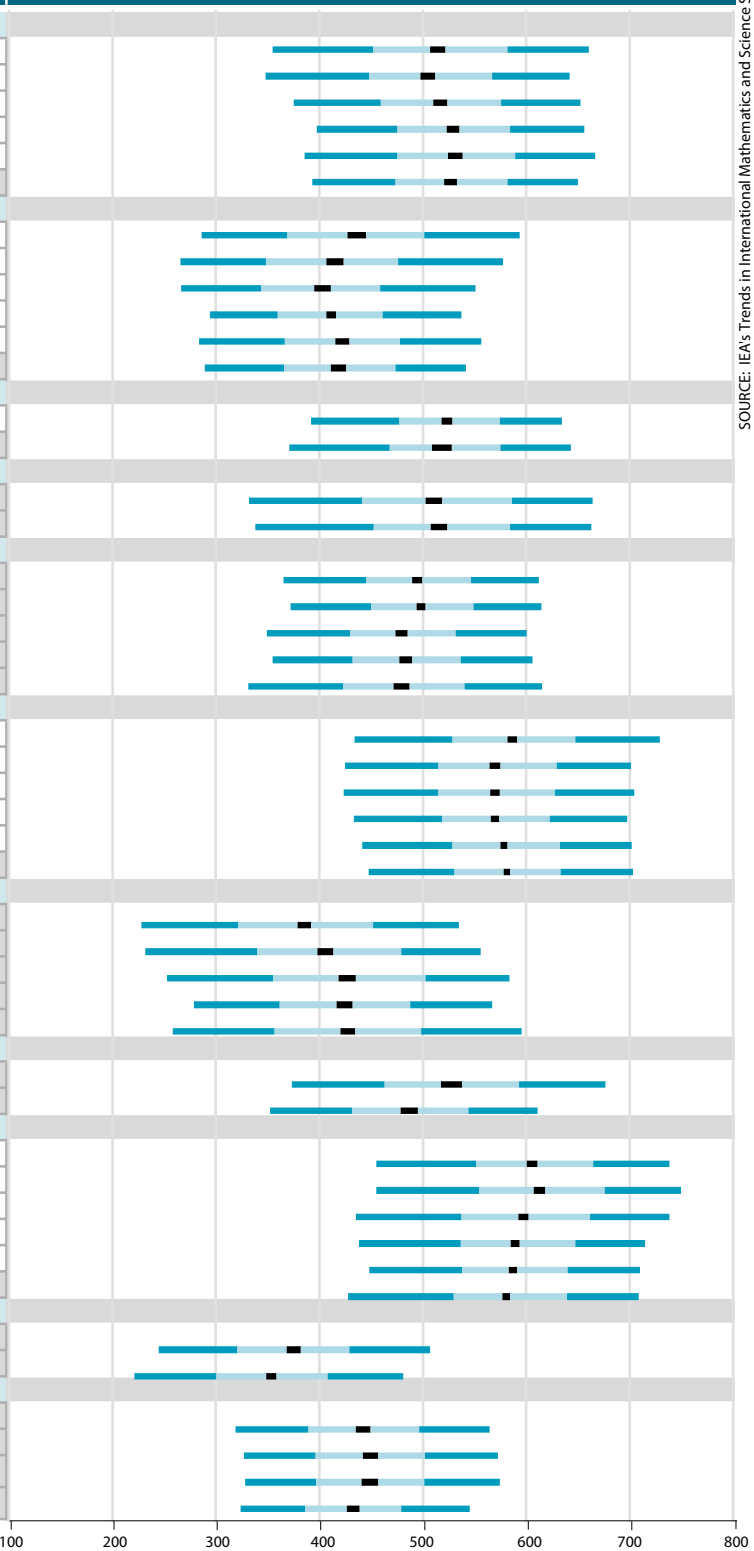
Exhibit 1.8: Differences in Mathematics Achievement Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

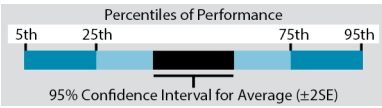
Country	Average Scale Score	Differences Between Years				
		2011	2007	2003	1999	1995
Hungary						
2015	514 (3.8)	10	-2	-15 ▼	-17 ▼	-12 ▼
2011	505 (3.5)		-12 ▼	-24 ▼	-27 ▼	-22 ▼
2007	517 (3.5)			-12 ▼	-15 ▼	-10 ▼
[2] 2003	529 (3.3)				-2	3
1999	532 (3.6)					5
1995	527 (3.2)					
Iran, Islamic Rep. of						
ψ 2015	436 (4.6)	21 ▲	33 ▲	25 ▲	14 ▲	18 ▲
ψ 2011	415 (4.3)		12	4	-7	-3
2007	403 (4.1)			-8	-19 ▼	-15 ▼
[2] 2003	411 (2.4)				-11 ▼	-7
1999	422 (3.4)					4
1995	418 (3.9)					
Ireland						
2015	523 (2.7)					5
1995	519 (4.9)					
Israel						
[3] 2015	511 (4.1)	-5				
[3] 2011	516 (4.1)					
Italy						
[2] 2015	494 (2.5)	-4	15 ▲	11 ▲	15 ▲	
2011	498 (2.3)		19 ▲	15 ▲	19 ▲	
2007	480 (3.1)			-4	0	
2003	484 (3.2)				4	
[2] 1999	479 (3.9)					
Japan						
2015	586 (2.3)	17 ▲	17 ▲	17 ▲	8 ▲	5
2011	570 (2.6)		0	0	-9 ▼	-11 ▼
2007	570 (2.4)			0	-9 ▼	-11 ▼
2003	570 (2.1)				-9 ▼	-11 ▼
1999	579 (1.7)					-2
1995	581 (1.6)					
Jordan						
ж 2015	386 (3.2)	-20 ▼	-41 ▼	-39 ▼	-42 ▼	
ψ 2011	406 (3.9)		-21 ▼	-18 ▼	-22 ▼	
2007	427 (4.2)			3	-1	
2003	424 (4.1)				-3	
1999	428 (3.7)					
Kazakhstan						
2015	528 (5.3)	41 ▲				
2011	487 (4.2)					
Korea, Rep. of						
2015	606 (2.6)	-7	8 ▲	17 ▲	19 ▲	25 ▲
2011	613 (2.9)		16 ▲	24 ▲	26 ▲	32 ▲
2007	597 (2.6)			8 ▲	10 ▲	17 ▲
◆◆ 2003	589 (2.2)				2	8 ▲
1999	587 (2.0)					6 ▲
1995	581 (2.0)					
Kuwait						
ψ 2015	375 (3.5)		21 ▲			
◆◆ 2007	354 (2.4)					
Lebanon						
2015	442 (3.6)	-7	-7	9		
2011	449 (3.9)		0	16 ▲		
2007	449 (4.1)			16 ▲		
2003	433 (3.1)					

Mathematics Achievement Distribution



▲ More recent year significantly higher

▼ More recent year significantly lower



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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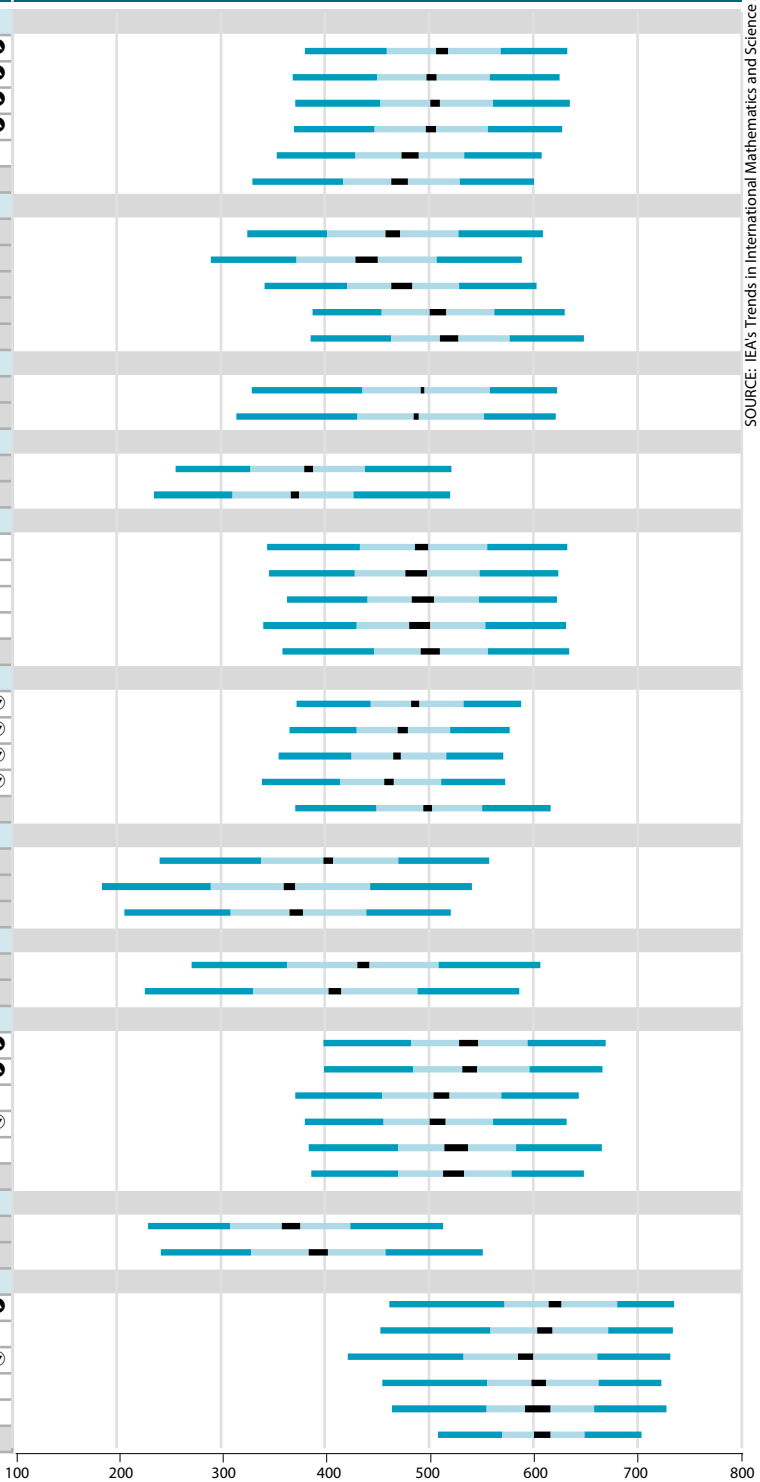
Exhibit 1.8: Differences in Mathematics Achievement Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

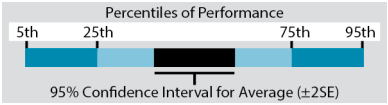
Country	Average Scale Score	Differences Between Years 2011	2007	2003	1999	1995
Lithuania						
[2] 2015	512 (2.9)	10 ▲	7	11 ▲	31 ▲	41 ▲
[1] 2011	502 (2.5)		-3	1	21 ▲	31 ▲
[1] 2007	506 (2.5)			4	24 ▲	34 ▲
[1] 2003	502 (2.5)				20 ▲	30 ▲
[1] ◆ 1999	482 (4.3)					10
[1 2] 1995	472 (4.1)					
Malaysia						
2015	465 (3.6)	25 ▲	-9	-43 ▼	-54 ▼	
2011	440 (5.5)		-34 ▼	-69 ▼	-79 ▼	
2007	474 (5.1)			-34 ▼	-45 ▼	
2003	508 (4.1)				-11	
1999	519 (4.5)					
Malta						
2015	494 (1.0)		6 ▲			
2007	488 (1.2)					
Morocco						
ж 2015	384 (2.3)	13 ▲				
ж 2011	371 (2.0)					
New Zealand						
† 2015	493 (3.4)	5		-1	2	-8
2011	488 (5.4)			-6	-3	-13
2003	494 (5.5)				3	-7
1999	491 (5.3)					-10
1995	501 (4.7)					
Norway (8)						
2015	487 (2.0)	12 ▲	18 ▲	25 ▲		-12 ▼
2011	475 (2.5)		5	13 ▲		-24 ▼
2007	469 (2.0)			8 ▲		-29 ▼
2003	461 (2.5)					-37 ▼
1995	498 (2.2)					
Oman						
ψ 2015	403 (2.4)	37 ▲	31 ▲			
ψ 2011	366 (2.9)		-6			
2007	372 (3.4)					
Qatar						
ψ 2015	437 (3.0)	28 ▲				
ψ 2011	410 (3.1)					
Russian Federation						
2015	538 (4.7)	-1	26 ▲	30 ▲	12	14 ▲
[2] 2011	539 (3.6)		27 ▲	31 ▲	13	15 ▲
2007	512 (4.0)			4	-14 ▼	-12
2003	508 (3.8)				-18 ▼	-16 ▼
1999	526 (5.8)					2
[2] 1995	524 (5.2)					
Saudi Arabia						
ж 2015	368 (4.6)	-26 ▼				
ψ 2011	394 (4.7)					
Singapore						
[2] 2015	621 (3.2)	10 ▲	28 ▲	16 ▲	17 ▲	12 ▲
[2] 2011	611 (3.8)		18 ▲	6	7	2
2007	593 (3.8)			-13 ▼	-12	-16 ▼
2003	605 (3.6)				1	-3
1999	604 (6.3)					-4
1995	609 (4.0)					

Mathematics Achievement Distribution



▲ More recent year significantly higher

▼ More recent year significantly lower



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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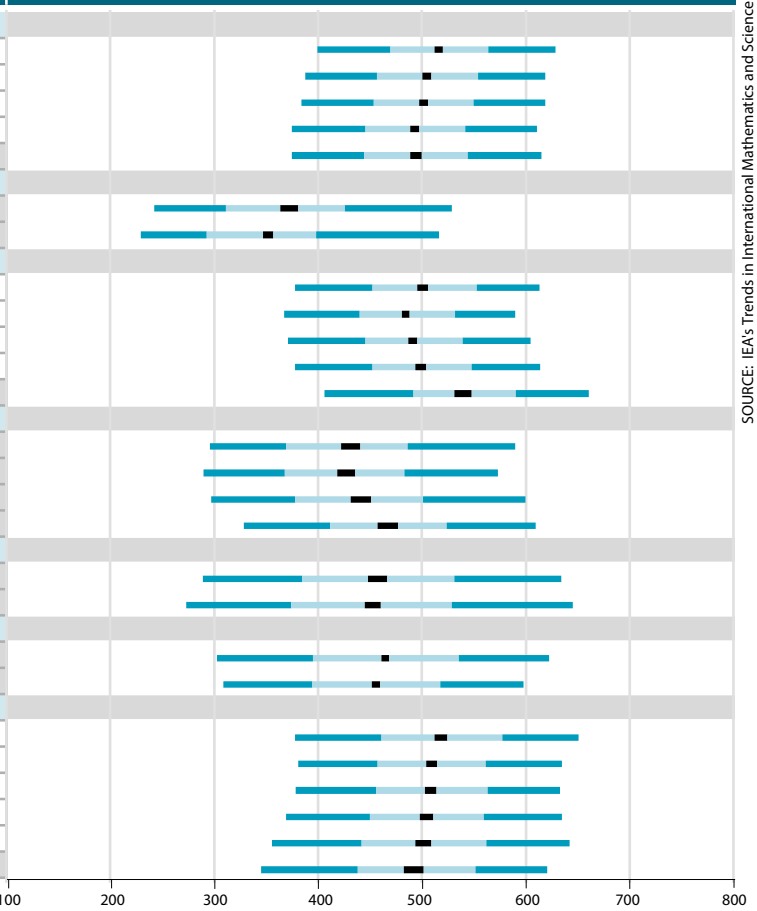
Exhibit 1.8: Differences in Mathematics Achievement Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

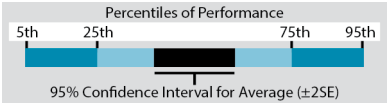
Country	Average Scale Score	Differences Between Years				
		2011	2007	2003	1999	1995
Slovenia						
2015	516 (2.1)	12 ▲	15 ▲	23 ▲		22 ▲
2011	505 (2.2)		3	12 ▲		10 ▲
2007	501 (2.2)			9 ▲		7
2003	493 (2.2)					-2
1995	494 (2.9)					
South Africa (9)						
ж 2015	372 (4.5)	20 ▲				
ж 2011	352 (2.5)					
Sweden						
2015	501 (2.8)	16 ▲	9 ▲	2		-39 ▼
2011	484 (1.9)		-7 ▼	-15 ▼		-55 ▼
2007	491 (2.3)			-8 ▼		-48 ▼
2003	499 (2.7)					-41 ▼
1995	540 (4.3)					
Thailand						
2015	431 (4.8)	4	-10		-36 ▼	
2011	427 (4.4)		-14 ▼		-40 ▼	
2007	441 (5.0)				-26 ▼	
1999	467 (5.1)					
Turkey						
2015	458 (4.7)	5				
2011	452 (4.0)					
United Arab Emirates						
2015	465 (2.0)	9 ▲				
2011	456 (2.1)					
United States						
† 2015	518 (3.1)	9 ▲	10 ▲	14 ▲	17 ▲	26 ▲
2 2011	509 (2.7)		1	5	8	17 ▲
2 † 2007	508 (2.9)			4	7	16 ▲
‡ 2003	504 (3.4)				3	12 ▲
1999	502 (3.9)					9
† 1995	492 (4.9)					

Mathematics Achievement Distribution



▲ More recent year significantly higher

▼ More recent year significantly lower



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

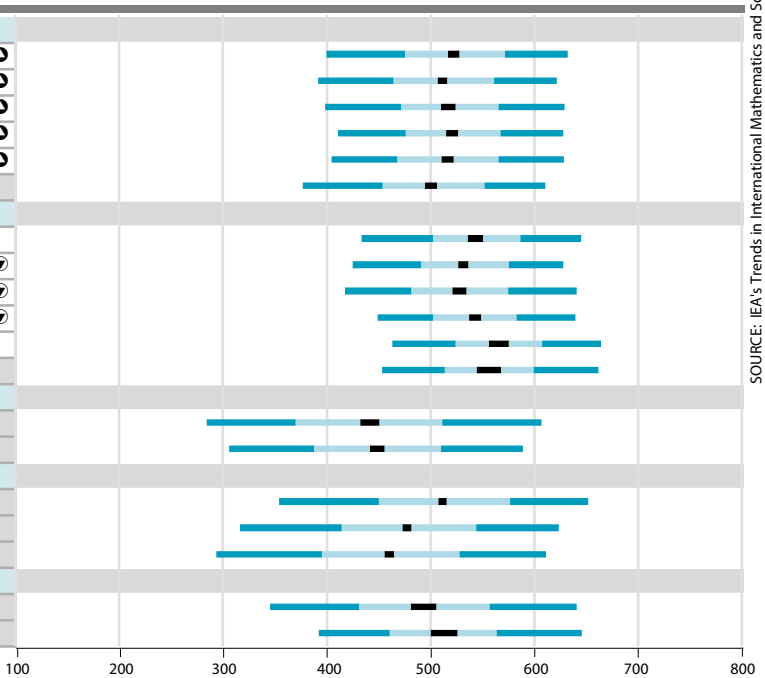
Downloaded from timss2015.org/download-center

Exhibit 1.8: Differences in Mathematics Achievement Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

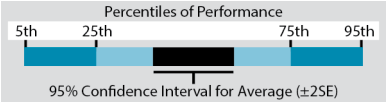
Country	Average Scale Score	Differences Between Years				
		2011	2007	2003	1999	1995
Benchmarking Participants						
Ontario, Canada						
2015	522 (2.9)	11 ▲	5	1	6	22 ▲
[2] 2011	512 (2.4)		-6	-9 ▼	-5	11 ▲
[2] 2007	517 (3.6)			-4	1	17 ▲
[2] 2003	521 (3.1)				4	20 ▲
1999	517 (3.0)					16 ▲
1995	501 (3.0)					
Quebec, Canada						
‡ 2015	543 (3.9)	12 ▲	15 ▲	0	-22 ▼	-13
2011	532 (2.4)		3	-12 ▼	-34 ▼	-25 ▼
[3] 2007	528 (3.5)			-15 ▼	-38 ▼	-28 ▼
2003	543 (3.1)				-23 ▼	-13 ▼
1999	566 (4.8)					9
1995	556 (6.0)					
Abu Dhabi, UAE						
2015	442 (4.7)	-7				
2011	449 (3.7)					
Dubai, UAE						
2015	512 (2.1)	34 ▲	51 ▲			
2011	478 (2.2)		17 ▲			
◆◆ ‡ 2007	461 (2.3)					
Florida, US						
[1] 2015	493 (6.4)	-20 ▼				
[1 2] 2011	513 (6.6)					

Mathematics Achievement Distribution



▲ More recent year significantly higher

▼ More recent year significantly lower



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 1.9: Relative Achievement of 2011 Fourth Grade Cohort as Eighth Grade Students in 2015 – Countries Assessed Both Grades in Both Assessment Years

Follow the blue arrow pointing diagonally downwards to compare relative performance among the TIMSS countries at the fourth grade in 2011 (upper-left panel) to relative performance at the eighth grade in 2015 (lower-right panel).

2011 - Fourth Grade

Country	Achievement Difference from TIMSS Scale Centerpoint (500)	
Singapore	106 (3.2)	▲
Korea, Rep. of	105 (1.9)	▲
Hong Kong SAR	102 (3.4)	▲
Chinese Taipei	91 (2.0)	▲
Japan	85 (1.7)	▲
England	42 (3.5)	▲
Russian Federation	42 (3.7)	▲
United States	41 (1.9)	▲
Lithuania	34 (2.4)	▲
Australia	16 (3.0)	▲
Hungary	15 (3.4)	▲
Slovenia	13 (2.1)	▲
Italy	8 (2.6)	▲
Sweden	4 (2.1)	
Kazakhstan	1 (4.5)	
Norway (4)	-5 (2.8)	
New Zealand	-14 (2.6)	▼
Turkey	-31 (4.7)	▼
Chile	-38 (2.3)	▼
Georgia	-50 (3.7)	▼
Bahrain	-64 (3.2)	▼
United Arab Emirates	-66 (2.0)	▼
Iran, Islamic Rep. of	-69 (3.5)	▼
Qatar	-87 (3.4)	▼
Saudi Arabia	-90 (5.2)	▼
Oman	-115 (2.9)	▼
Morocco	-165 (4.0)	▼

2015 - Fourth Grade

Country	Achievement Difference from TIMSS Scale Centerpoint (500)	
Singapore	118 (3.8)	▲
Hong Kong SAR	115 (2.9)	▲
Korea, Rep. of	108 (2.2)	▲
Chinese Taipei	97 (1.9)	▲
Japan	93 (2.0)	▲
Russian Federation	64 (3.4)	▲
England	46 (2.8)	▲
Kazakhstan	44 (4.5)	▲
United States	39 (2.3)	▲
Lithuania	36 (2.7)	▲
Hungary	29 (3.2)	▲
Slovenia	20 (1.9)	▲
Sweden	19 (2.8)	▲
Australia	17 (3.1)	▲
Italy	7 (2.6)	▲
Norway (4)	-7 (2.3)	▼
New Zealand	-9 (2.3)	▼
Turkey	-17 (3.1)	▼
Georgia	-37 (3.6)	▼
Chile	-41 (2.4)	▼
United Arab Emirates	-48 (2.4)	▼
Bahrain	-49 (1.6)	▼
Qatar	-61 (3.4)	▼
Iran, Islamic Rep. of	-69 (3.2)	▼
Oman	-75 (2.5)	▼
Saudi Arabia	-117 (4.1)	▼
Morocco	-123 (3.4)	▼

2011 - Eighth Grade

Country	Achievement Difference from TIMSS Scale Centerpoint (500)	
Korea, Rep. of	113 (2.9)	▲
Singapore	111 (3.8)	▲
Chinese Taipei	109 (3.2)	▲
Hong Kong SAR	86 (3.9)	▲
Japan	70 (2.6)	▲
Russian Federation	39 (3.6)	▲
United States	9 (2.7)	▲
England	7 (5.6)	
Hungary	5 (3.5)	
Australia	5 (5.2)	
Slovenia	5 (2.2)	▲
Lithuania	2 (2.5)	
Italy	-2 (2.3)	
New Zealand	-12 (5.4)	▼
Kazakhstan	-13 (4.2)	▼
Sweden	-16 (1.9)	▼
Norway (8)	-25 (2.5)	▼
United Arab Emirates	-44 (2.1)	▼
Turkey	-48 (4.0)	▼
Georgia	-69 (3.7)	▼
Chile	-84 (2.7)	▼
Iran, Islamic Rep. of	-85 (4.3)	▼
Qatar	-90 (3.1)	▼
Bahrain	-91 (1.9)	▼
Saudi Arabia	-106 (4.7)	▼
Morocco	-129 (2.0)	▼
Oman	-134 (2.9)	▼

2015 - Eighth Grade

Country	Achievement Difference from TIMSS Scale Centerpoint (500)	
Singapore	121 (3.2)	▲
Korea, Rep. of	106 (2.6)	▲
Chinese Taipei	99 (2.4)	▲
Hong Kong SAR	94 (4.6)	▲
Japan	86 (2.3)	▲
Russian Federation	38 (4.7)	▲
Kazakhstan	28 (5.3)	▲
United States	18 (3.1)	▲
England	18 (4.2)	▲
Slovenia	16 (2.1)	▲
Hungary	14 (3.8)	▲
Lithuania	12 (2.9)	▲
Australia	5 (3.1)	
Sweden	1 (2.8)	
Italy	-6 (2.5)	▼
New Zealand	-7 (3.4)	▼
Norway (8)	-13 (2.0)	▼
United Arab Emirates	-35 (2.0)	▼
Turkey	-42 (4.7)	▼
Bahrain	-46 (1.4)	▼
Georgia	-47 (3.4)	▼
Qatar	-63 (3.0)	▼
Iran, Islamic Rep. of	-64 (4.6)	▼
Chile	-73 (3.2)	▼
Oman	-97 (2.4)	▼
Morocco	-116 (2.3)	▼
Saudi Arabia	-132 (4.6)	▼

▲ Country average significantly higher than the centerpoint of the TIMSS scale

▼ Country average significantly lower than the centerpoint of the TIMSS scale

Trend results for Lithuania do not include students taught in Polish or in Russian.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 1.9: Relative Achievement of 2011 Fourth Grade Cohort as Eighth Grade Students in 2015 – Countries Assessed Both Grades in Both Assessment Years (Continued)

2011 - Fourth Grade

Country	Achievement Difference from TIMSS Scale Centerpoint (500)
Benchmarking Participants	
Florida, US	45 (3.0) ▲
Quebec, Canada	33 (2.5) ▲
Ontario, Canada	18 (3.0) ▲
Dubai, UAE	-32 (1.7) ▼
Abu Dhabi, UAE	-83 (4.6) ▼

2011 - Eighth Grade

Country	Achievement Difference from TIMSS Scale Centerpoint (500)
Benchmarking Participants	
Quebec, Canada	32 (2.4) ▲
Florida, US	13 (6.6) ▲
Ontario, Canada	12 (2.4) ▲
Dubai, UAE	-22 (2.2) ▼
Abu Dhabi, UAE	-51 (3.7) ▼

2015 - Fourth Grade

Country	Achievement Difference from TIMSS Scale Centerpoint (500)
Benchmarking Participants	
Florida, US	46 (4.7) ▲
Quebec, Canada	36 (4.0) ▲
Ontario, Canada	12 (2.3) ▲
Dubai, UAE	11 (1.4) ▲
Abu Dhabi, UAE	-81 (4.7) ▼

2015 - Eighth Grade

Country	Achievement Difference from TIMSS Scale Centerpoint (500)
Benchmarking Participants	
Quebec, Canada	43 (3.9) ▲
Ontario, Canada	22 (2.9) ▲
Dubai, UAE	12 (2.1) ▲
Florida, US	-7 (6.4)
Abu Dhabi, UAE	-58 (4.7) ▼

▲ Country average significantly higher than the centerpoint of the TIMSS scale
▼ Country average significantly lower than the centerpoint of the TIMSS scale

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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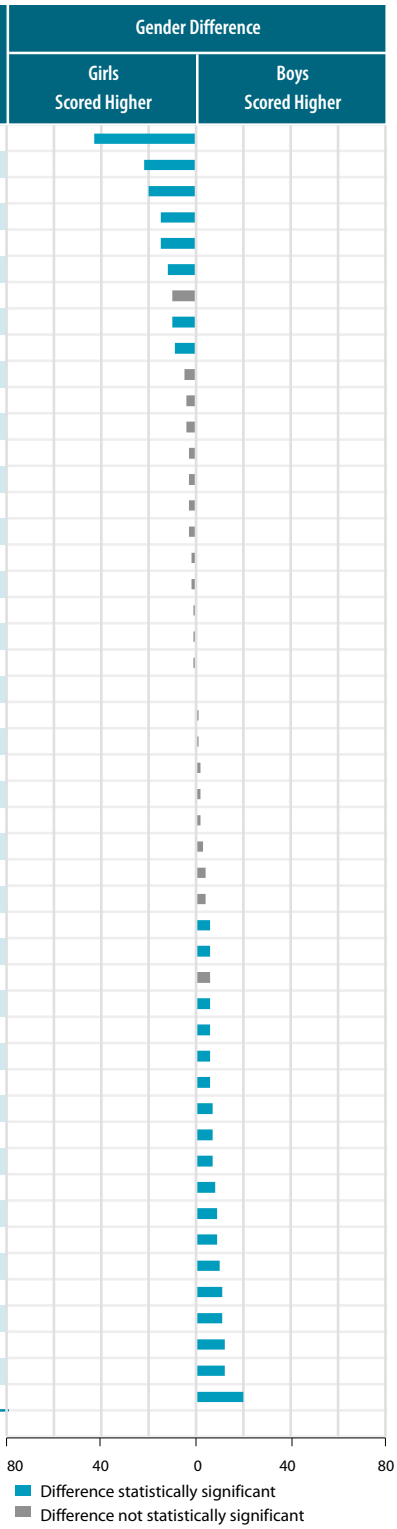
Exhibit 1.10: Average Mathematics Achievement by Gender

Country	Girls		Boys		Difference (Absolute Value)
	Percent of Students	Average Scale Score	Percent of Students	Average Scale Score	
ψ Saudi Arabia	49 (1.0)	405 (4.4)	51 (1.0)	363 (6.5)	43 (7.7)
Oman	50 (0.7)	436 (3.0)	50 (0.7)	415 (2.8)	22 (2.9)
Jordan	46 (2.4)	399 (3.3)	54 (2.4)	379 (4.9)	20 (5.8)
South Africa (5)	48 (0.8)	384 (3.8)	52 (0.8)	368 (4.4)	15 (4.2)
2 Bahrain	50 (0.7)	459 (1.7)	50 (0.7)	443 (2.3)	15 (2.5)
ψ Kuwait	51 (2.0)	359 (5.4)	49 (2.0)	347 (5.6)	12 (6.2)
Iran, Islamic Rep. of	50 (0.9)	437 (4.5)	50 (0.9)	426 (4.5)	10 (6.3)
Indonesia	48 (0.6)	403 (4.0)	52 (0.6)	393 (3.9)	10 (2.7)
Finland	48 (0.8)	540 (2.3)	52 (0.8)	531 (2.6)	9 (2.9)
Bulgaria	49 (0.8)	527 (5.7)	51 (0.8)	522 (5.1)	5 (2.9)
Norway (5)	49 (0.9)	551 (2.6)	51 (0.9)	547 (3.1)	4 (2.9)
2 Singapore	48 (0.5)	620 (3.9)	52 (0.5)	616 (4.3)	4 (3.0)
United Arab Emirates	48 (2.2)	453 (3.9)	52 (2.2)	450 (3.4)	3 (5.4)
1 Georgia	49 (0.9)	465 (3.9)	51 (0.9)	461 (4.4)	3 (4.0)
3 Serbia	48 (0.8)	520 (3.7)	52 (0.8)	517 (4.7)	3 (4.7)
Qatar	51 (2.5)	440 (4.1)	49 (2.5)	438 (4.9)	3 (5.9)
2 Lithuania	50 (0.9)	537 (2.8)	50 (0.9)	534 (3.1)	2 (3.3)
Kazakhstan	49 (0.8)	546 (4.6)	51 (0.8)	543 (4.8)	2 (2.8)
Morocco	48 (0.7)	378 (3.5)	52 (0.7)	377 (3.9)	1 (2.8)
2 Sweden	49 (1.0)	519 (3.2)	51 (1.0)	518 (3.2)	1 (3.0)
Russian Federation	49 (0.9)	564 (3.7)	51 (0.9)	564 (3.7)	1 (2.8)
Japan	50 (0.5)	593 (2.0)	50 (0.5)	593 (2.5)	0 (2.3)
Chile	49 (1.7)	458 (2.8)	51 (1.7)	459 (3.0)	1 (3.2)
Poland	50 (0.8)	534 (2.3)	50 (0.8)	536 (2.7)	1 (2.5)
Turkey	49 (0.6)	482 (3.2)	51 (0.6)	484 (3.5)	2 (2.7)
‡ Northern Ireland	50 (1.1)	569 (3.8)	50 (1.1)	571 (3.1)	2 (3.8)
New Zealand	49 (0.7)	489 (2.8)	51 (0.7)	492 (2.6)	2 (2.8)
Germany	48 (0.7)	520 (2.4)	52 (0.7)	523 (2.3)	3 (2.3)
Ireland	47 (1.5)	545 (2.6)	53 (1.5)	549 (2.9)	4 (3.4)
Slovenia	49 (0.8)	518 (2.1)	51 (0.8)	522 (2.4)	4 (2.6)
Chinese Taipei	49 (0.6)	594 (2.2)	51 (0.6)	599 (2.3)	6 (2.5)
† Belgium (Flemish)	50 (0.9)	543 (2.4)	50 (0.9)	549 (2.4)	6 (2.4)
Hungary	49 (0.9)	526 (3.4)	51 (0.9)	532 (3.8)	6 (3.4)
France	49 (0.7)	485 (3.2)	51 (0.7)	491 (3.2)	6 (2.8)
2 † Denmark	49 (0.8)	536 (3.1)	51 (0.8)	542 (3.0)	6 (2.8)
England	51 (0.7)	543 (3.0)	49 (0.7)	549 (3.3)	6 (2.9)
Cyprus	49 (0.7)	520 (2.9)	51 (0.7)	526 (3.1)	6 (2.7)
2 † United States	51 (0.6)	536 (2.3)	49 (0.6)	543 (2.6)	7 (1.9)
Czech Republic	49 (0.9)	525 (3.0)	51 (0.9)	532 (2.5)	7 (3.2)
Korea, Rep. of	48 (0.5)	604 (2.3)	52 (0.5)	612 (2.5)	7 (1.9)
† Netherlands	50 (0.9)	526 (1.8)	50 (0.9)	534 (2.2)	8 (2.2)
Australia	49 (1.0)	513 (3.1)	51 (1.0)	522 (3.9)	9 (3.5)
1 2 † Canada	49 (0.5)	506 (2.5)	51 (0.5)	515 (2.6)	9 (2.1)
† Hong Kong SAR	46 (1.5)	609 (3.8)	54 (1.5)	619 (2.8)	10 (3.3)
2 Portugal	49 (0.8)	536 (2.4)	51 (0.8)	547 (2.5)	11 (2.2)
Slovak Republic	48 (0.9)	493 (3.0)	52 (0.9)	504 (2.6)	11 (2.6)
2 Spain	49 (0.9)	499 (2.7)	51 (0.9)	511 (2.7)	12 (2.4)
Croatia	49 (0.8)	496 (2.1)	51 (0.8)	508 (2.3)	12 (2.7)
2 Italy	49 (0.7)	497 (2.7)	51 (0.7)	517 (3.0)	20 (2.7)
International Avg.	49 (0.2)	505 (0.5)	51 (0.2)	505 (0.5)	



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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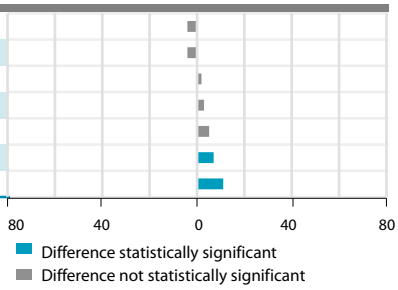
Exhibit 1.10: Average Mathematics Achievement by Gender (Continued)

Country	Girls		Boys		Difference (Absolute Value)	Gender Difference	
	Percent of Students	Average Scale Score	Percent of Students	Average Scale Score		Girls Scored Higher	Boys Scored Higher
Benchmarking Participants							
[2] ψ Abu Dhabi, UAE	47 (3.7)	422 (8.0)	53 (3.7)	417 (6.6)	4 (11.2)		
[1] Florida, US	49 (1.1)	548 (4.9)	51 (1.1)	544 (5.5)	4 (4.5)		
Dubai, UAE	48 (3.3)	510 (3.1)	52 (3.3)	512 (2.7)	2 (5.0)		
Norway (4)	49 (0.9)	492 (2.9)	51 (0.9)	494 (3.0)	3 (3.6)		
Buenos Aires, Argentina	50 (1.0)	430 (3.5)	50 (1.0)	435 (2.9)	5 (2.8)		
Ontario, Canada	49 (0.8)	509 (2.6)	51 (0.8)	516 (2.8)	7 (2.9)		
‡ Quebec, Canada	50 (1.0)	531 (3.9)	50 (1.0)	541 (4.8)	11 (3.8)		



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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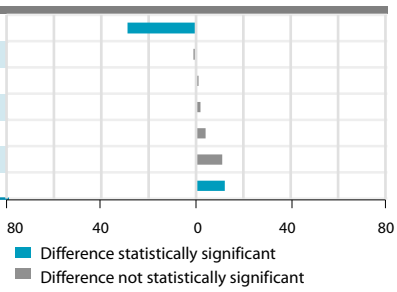
Exhibit 1.11: Average Mathematics Achievement by Gender

Country	Girls		Boys		Difference (Absolute Value)
	Percent of Students	Average Scale Score	Percent of Students	Average Scale Score	
ψ Oman	48 (1.7)	420 (2.9)	52 (1.7)	388 (3.5)	32 (4.6)
ψ Botswana (9)	51 (0.6)	400 (2.5)	49 (0.6)	381 (2.5)	19 (2.9)
ж Jordan	50 (2.6)	395 (4.0)	50 (2.6)	376 (5.4)	19 (7.0)
Thailand	54 (1.5)	440 (5.2)	46 (1.5)	422 (5.7)	18 (5.5)
Bahrain	48 (0.9)	462 (2.4)	52 (0.9)	446 (2.2)	16 (3.6)
ж Saudi Arabia	51 (1.6)	375 (5.1)	49 (1.6)	360 (7.1)	14 (8.2)
United Arab Emirates	50 (2.5)	471 (3.5)	50 (2.5)	459 (4.0)	12 (6.4)
Malaysia	50 (1.8)	470 (3.8)	50 (1.8)	461 (3.8)	9 (2.8)
2 Singapore	49 (0.6)	626 (3.4)	51 (0.6)	616 (3.8)	9 (3.5)
ψ Egypt	53 (2.3)	397 (5.5)	47 (2.3)	387 (5.1)	9 (6.7)
ж South Africa (9)	51 (1.1)	376 (5.3)	49 (1.1)	369 (4.6)	7 (4.1)
ψ Kuwait	50 (2.5)	396 (4.6)	50 (2.5)	389 (7.1)	7 (7.5)
ψ Qatar	50 (3.0)	440 (3.2)	50 (3.0)	434 (4.5)	7 (4.9)
Turkey	48 (0.8)	461 (4.8)	52 (0.8)	455 (5.3)	6 (3.6)
Kazakhstan	49 (0.9)	531 (5.8)	51 (0.9)	525 (5.3)	6 (3.7)
ψ Iran, Islamic Rep. of	48 (0.9)	438 (5.0)	52 (0.9)	435 (7.5)	3 (8.9)
England	51 (1.6)	520 (5.2)	49 (1.6)	517 (4.8)	3 (5.6)
Malta	49 (0.3)	495 (1.8)	51 (0.3)	492 (1.6)	3 (2.8)
† New Zealand	51 (2.0)	494 (3.2)	49 (2.0)	491 (4.6)	3 (4.2)
Japan	51 (1.0)	588 (3.1)	49 (1.0)	585 (3.0)	2 (4.2)
ж Morocco	46 (0.7)	385 (2.3)	54 (0.7)	384 (2.6)	2 (2.0)
1 2 Georgia	47 (0.9)	454 (3.9)	53 (0.9)	453 (4.0)	1 (4.0)
Chinese Taipei	49 (0.8)	599 (2.6)	51 (0.8)	599 (3.0)	0 (2.8)
Korea, Rep. of	47 (0.5)	605 (2.6)	53 (0.5)	606 (3.1)	1 (2.7)
Norway (9)	50 (0.7)	511 (2.5)	50 (0.7)	512 (2.7)	1 (2.6)
† United States	50 (0.6)	517 (3.3)	50 (0.6)	519 (3.2)	2 (2.0)
Australia	51 (1.6)	504 (3.8)	49 (1.6)	506 (3.5)	2 (4.0)
3 Israel	49 (1.2)	510 (4.3)	51 (1.2)	512 (4.8)	2 (3.9)
Slovenia	48 (0.7)	515 (2.4)	52 (0.7)	518 (2.5)	2 (2.4)
Lebanon	53 (1.6)	441 (3.7)	47 (1.6)	444 (4.5)	3 (3.9)
2 Lithuania	50 (0.8)	510 (3.4)	50 (0.8)	513 (3.1)	3 (3.4)
1 † Canada	51 (1.0)	525 (2.0)	49 (1.0)	530 (2.7)	4 (2.0)
Ireland	50 (1.1)	521 (2.6)	50 (1.1)	526 (4.0)	5 (3.9)
Hong Kong SAR	47 (2.1)	591 (4.7)	53 (2.1)	597 (6.0)	5 (5.7)
2 Italy	49 (0.8)	491 (3.0)	51 (0.8)	498 (2.8)	7 (2.8)
Sweden	48 (1.0)	497 (3.3)	52 (1.0)	504 (3.1)	7 (3.2)
Hungary	50 (0.9)	510 (4.3)	50 (0.9)	519 (4.0)	9 (3.4)
Russian Federation	49 (0.9)	533 (5.1)	51 (0.9)	543 (4.6)	9 (2.9)
ψ Chile	48 (1.8)	418 (3.7)	52 (1.8)	436 (4.2)	18 (4.9)
International Avg.	50 (0.2)	483 (0.6)	50 (0.2)	480 (0.7)	

Benchmarking Participants

Abu Dhabi, UAE	49 (4.4)	457 (6.0)	51 (4.4)	427 (7.7)	29 (10.7)
1 Florida, US	48 (1.3)	494 (7.2)	52 (1.3)	493 (6.5)	1 (4.7)
Norway (8)	50 (0.7)	486 (2.4)	50 (0.7)	487 (2.3)	1 (2.5)
Ontario, Canada	50 (1.2)	521 (2.9)	50 (1.2)	523 (3.3)	2 (2.6)
Dubai, UAE	52 (3.7)	510 (3.7)	48 (3.7)	514 (4.3)	4 (6.9)
† ж Buenos Aires, Argentina	51 (1.7)	391 (4.8)	49 (1.7)	401 (5.4)	11 (5.8)
‡ Quebec, Canada	53 (1.9)	538 (3.8)	47 (1.9)	550 (5.1)	12 (4.6)



ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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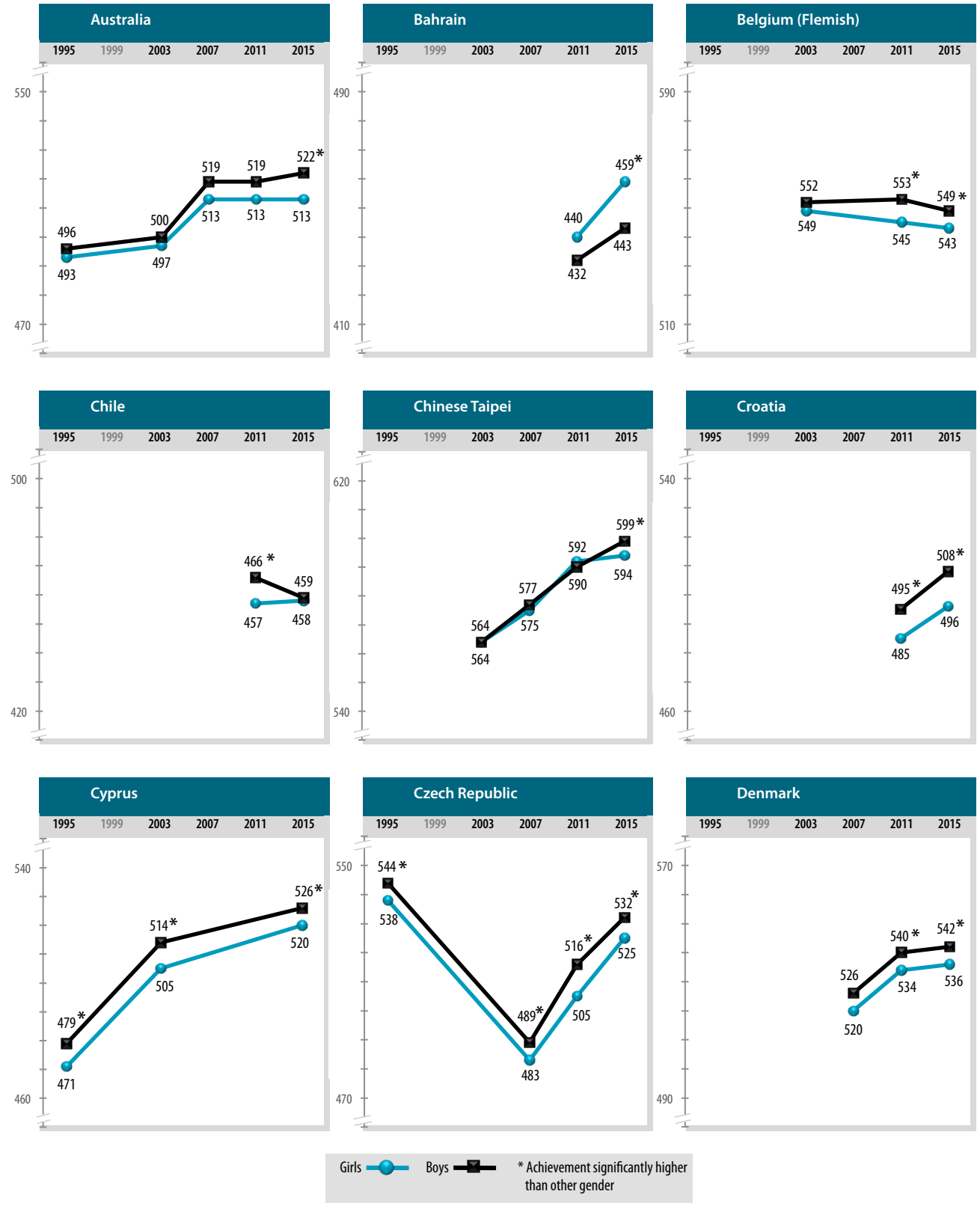
Exhibit 1.12: Trends in Mathematics Achievement by Gender◊



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

◊ No fourth grade assessment in 1999.

Scale interval is 10 points for each country, but the part of the scale shown differs according to each country's average achievement.

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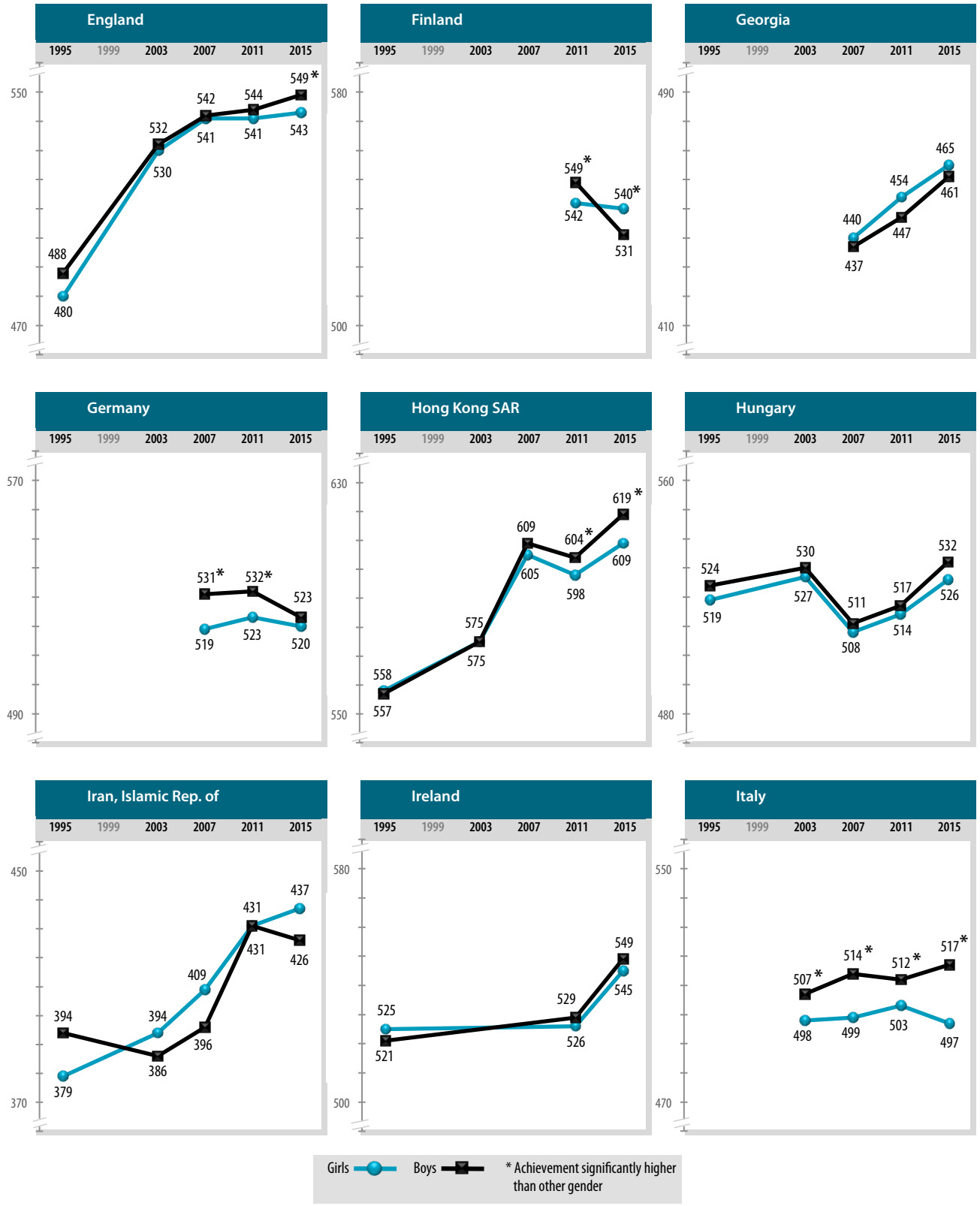
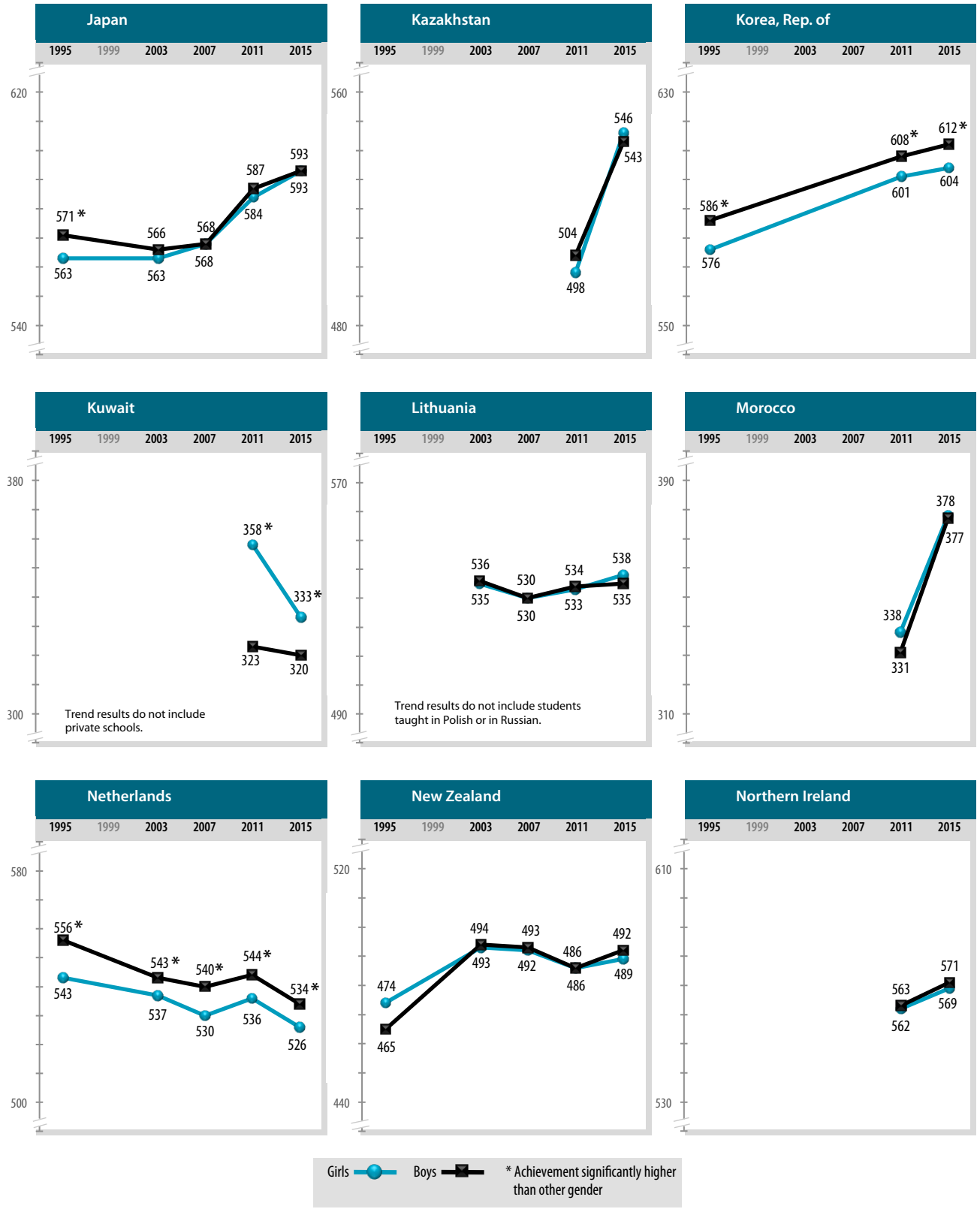
Exhibit 1.12: Trends in Mathematics Achievement by Gender◊ (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

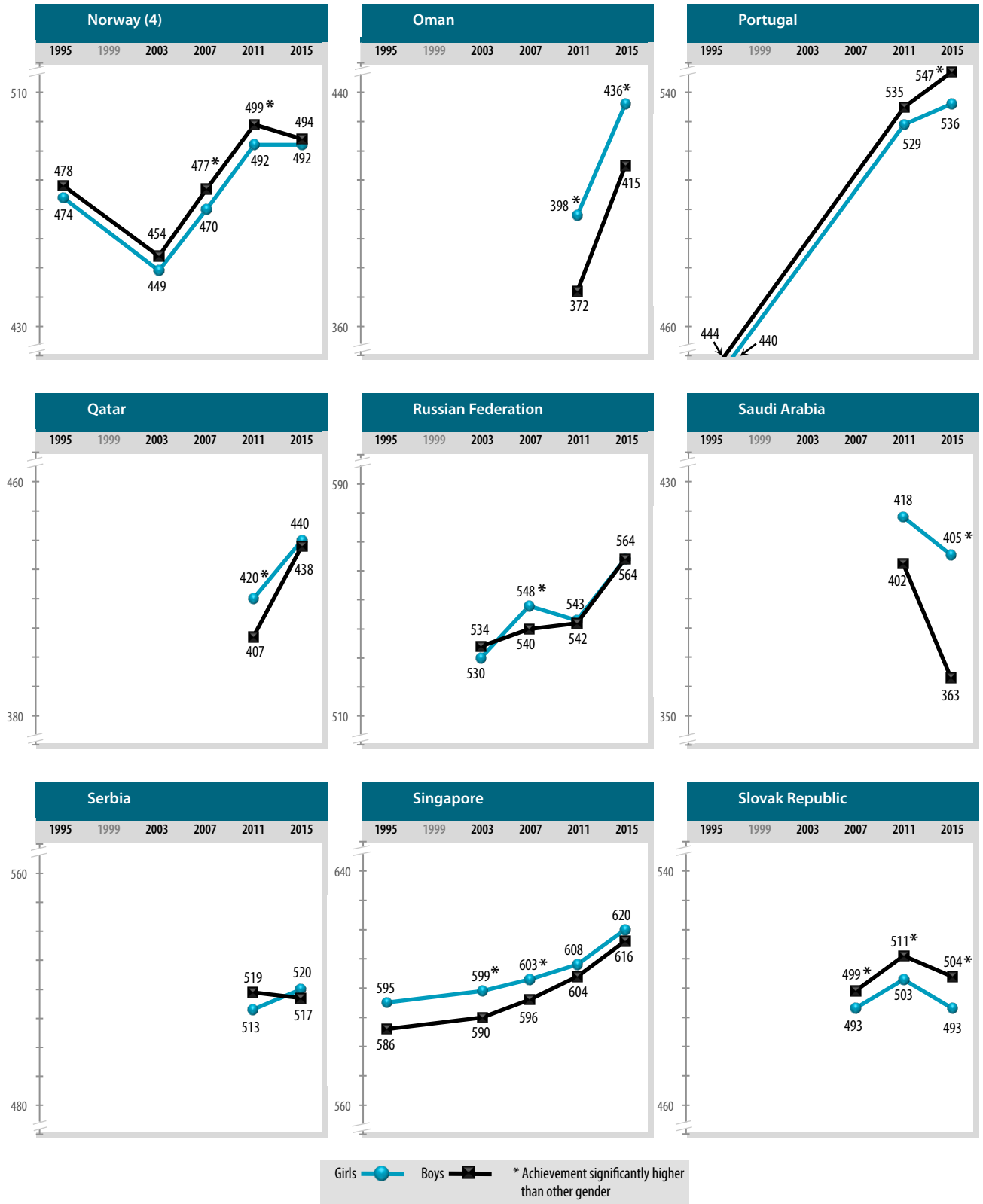
Exhibit 1.12: Trends in Mathematics Achievement by Gender◊ (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

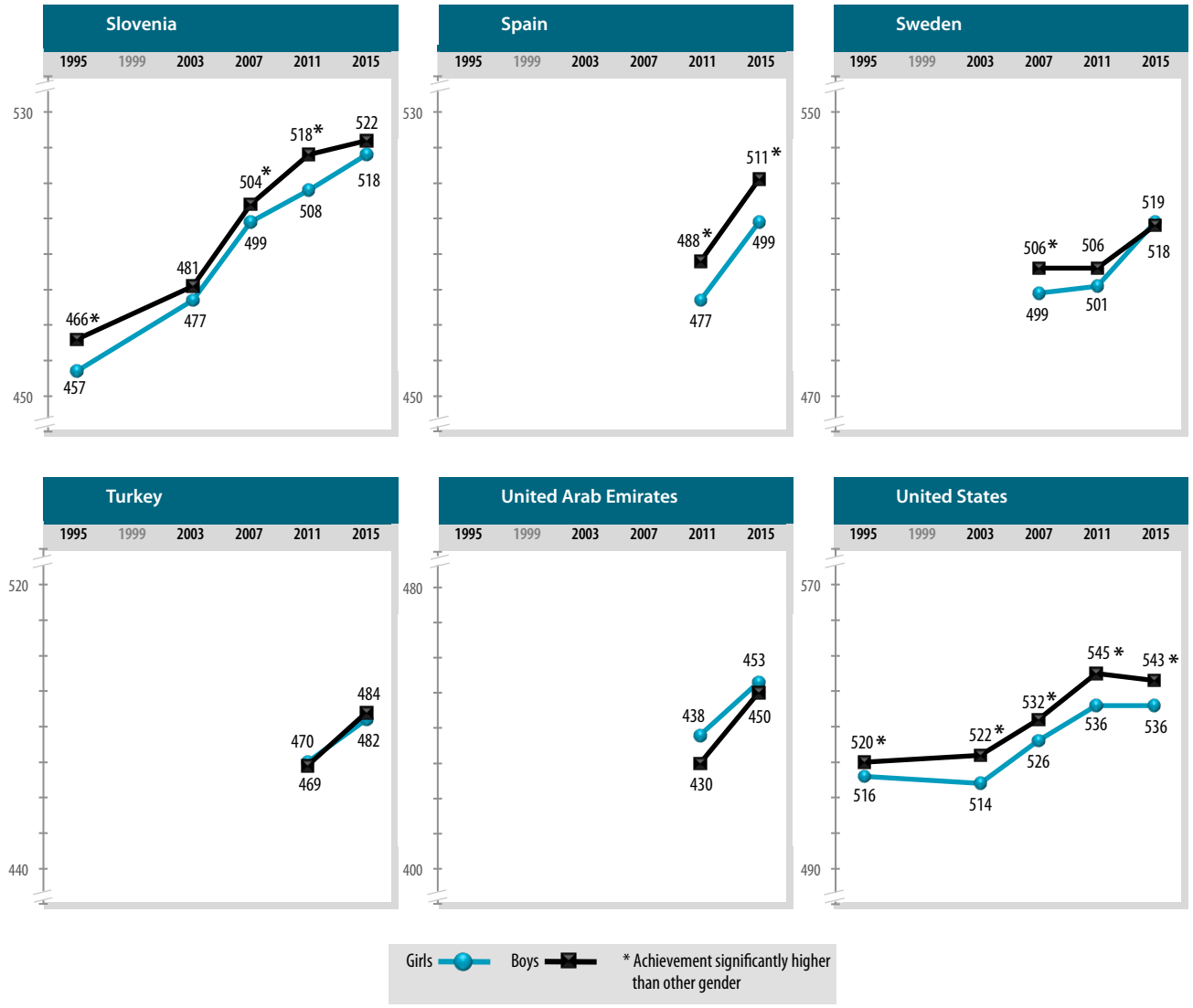
Exhibit 1.12: Trends in Mathematics Achievement by Gender◊ (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 1.12: Trends in Mathematics Achievement by Gender◊ (Continued)

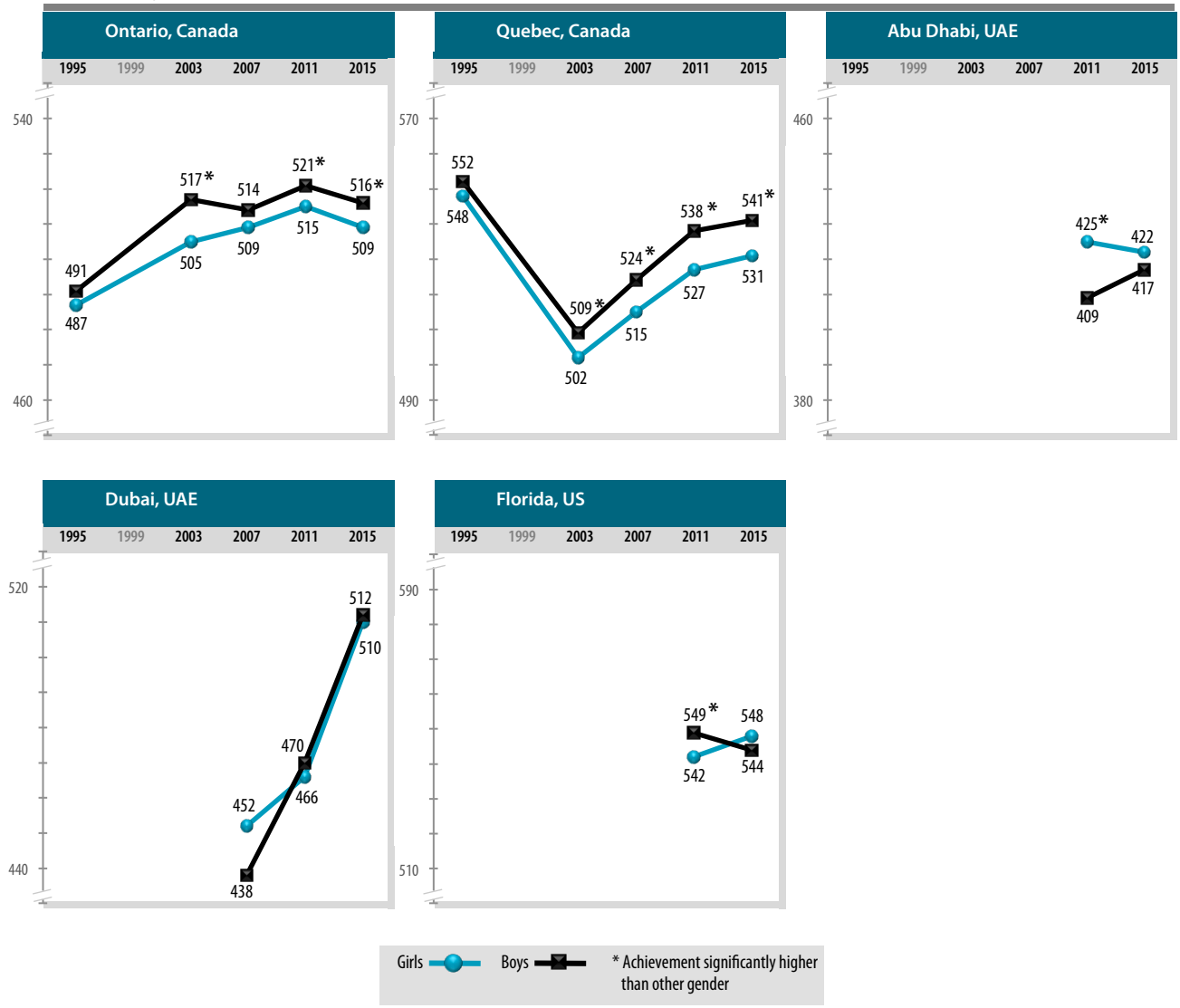


SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 1.12: Trends in Mathematics Achievement by Gender◊ (Continued)

Benchmarking Participants



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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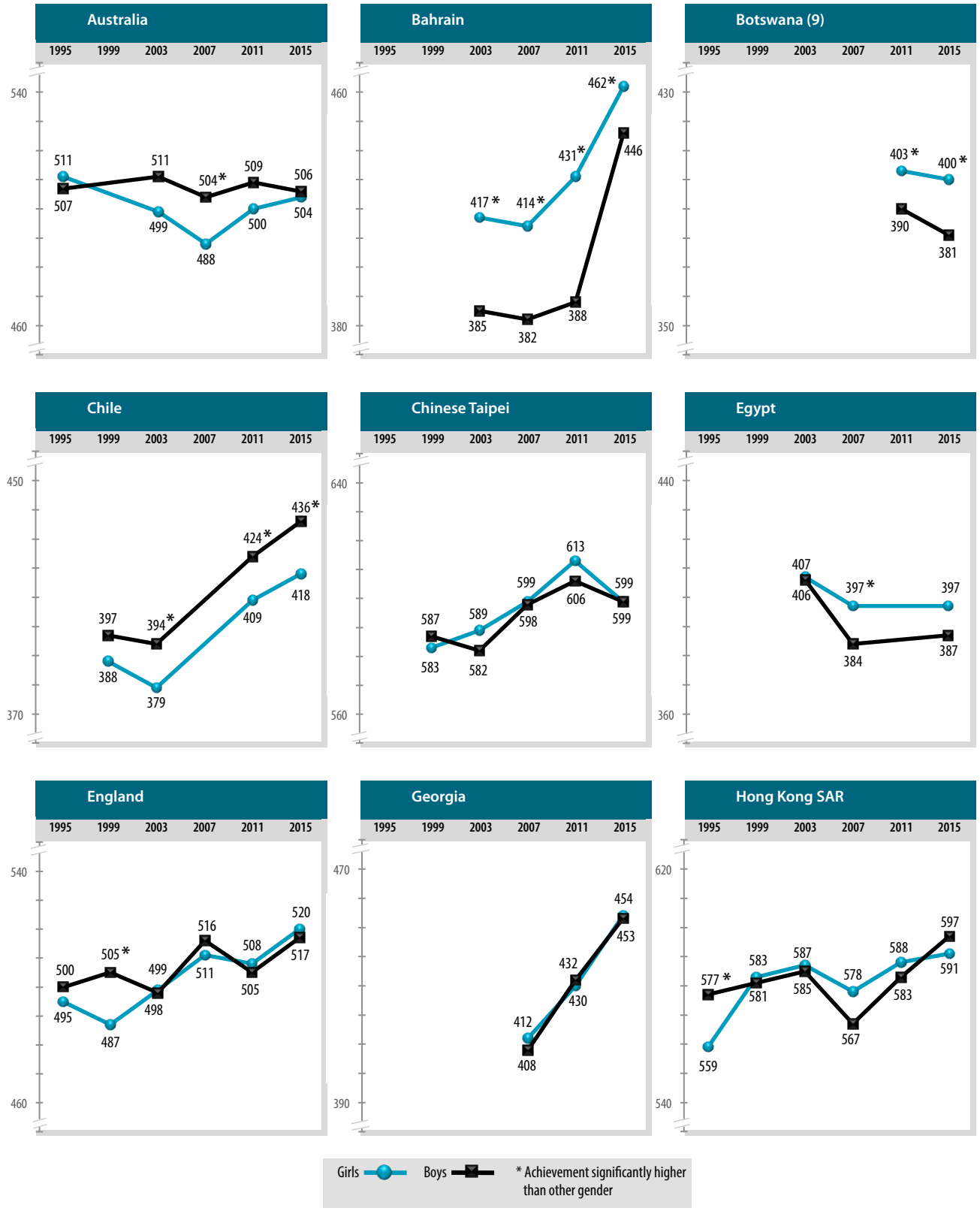
Exhibit 1.13: Trends in Mathematics Achievement by Gender

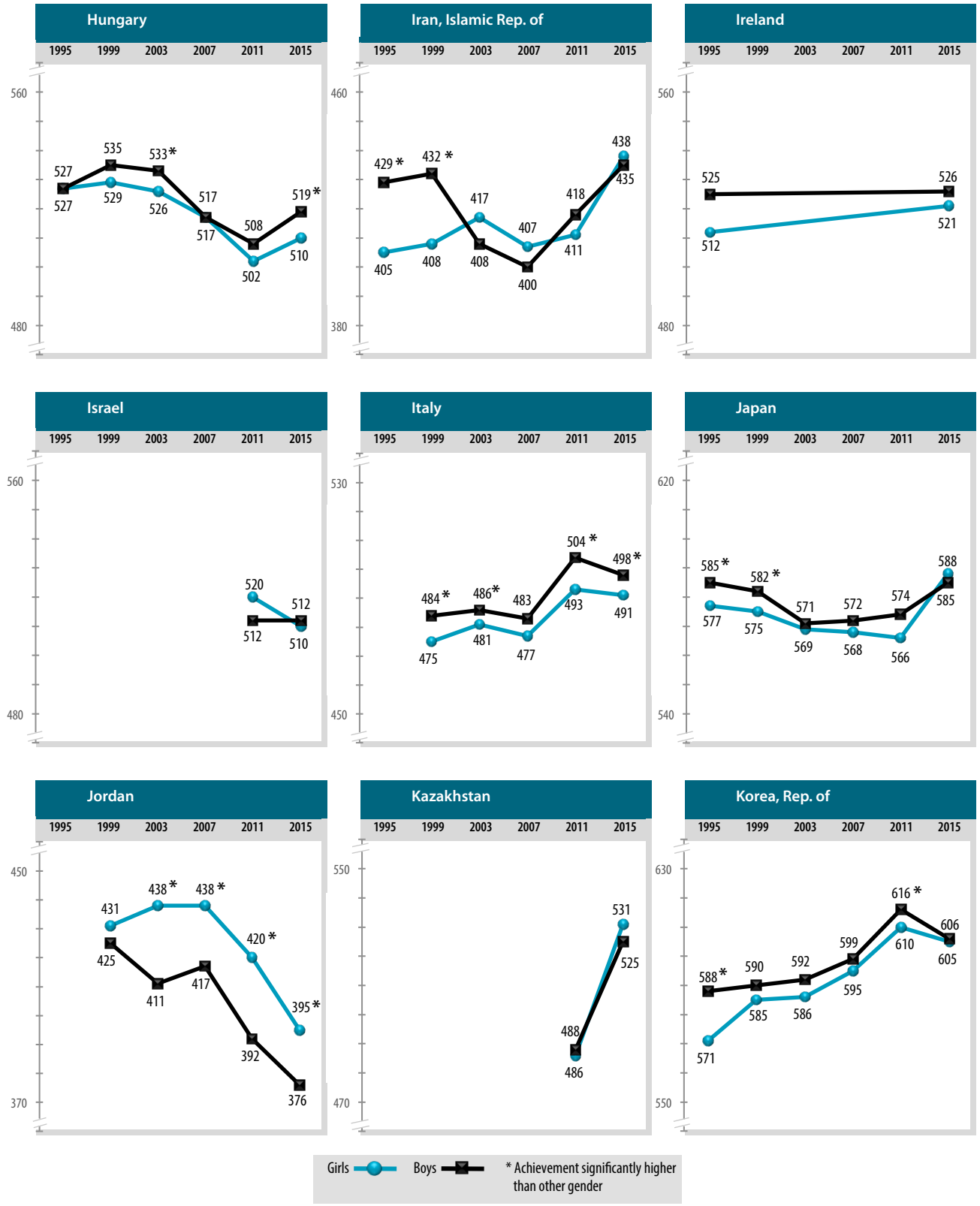


SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Scale interval is 10 points for each country, but the part of the scale shown differs according to each country's average achievement.

Downloaded from timss2015.org/download-center

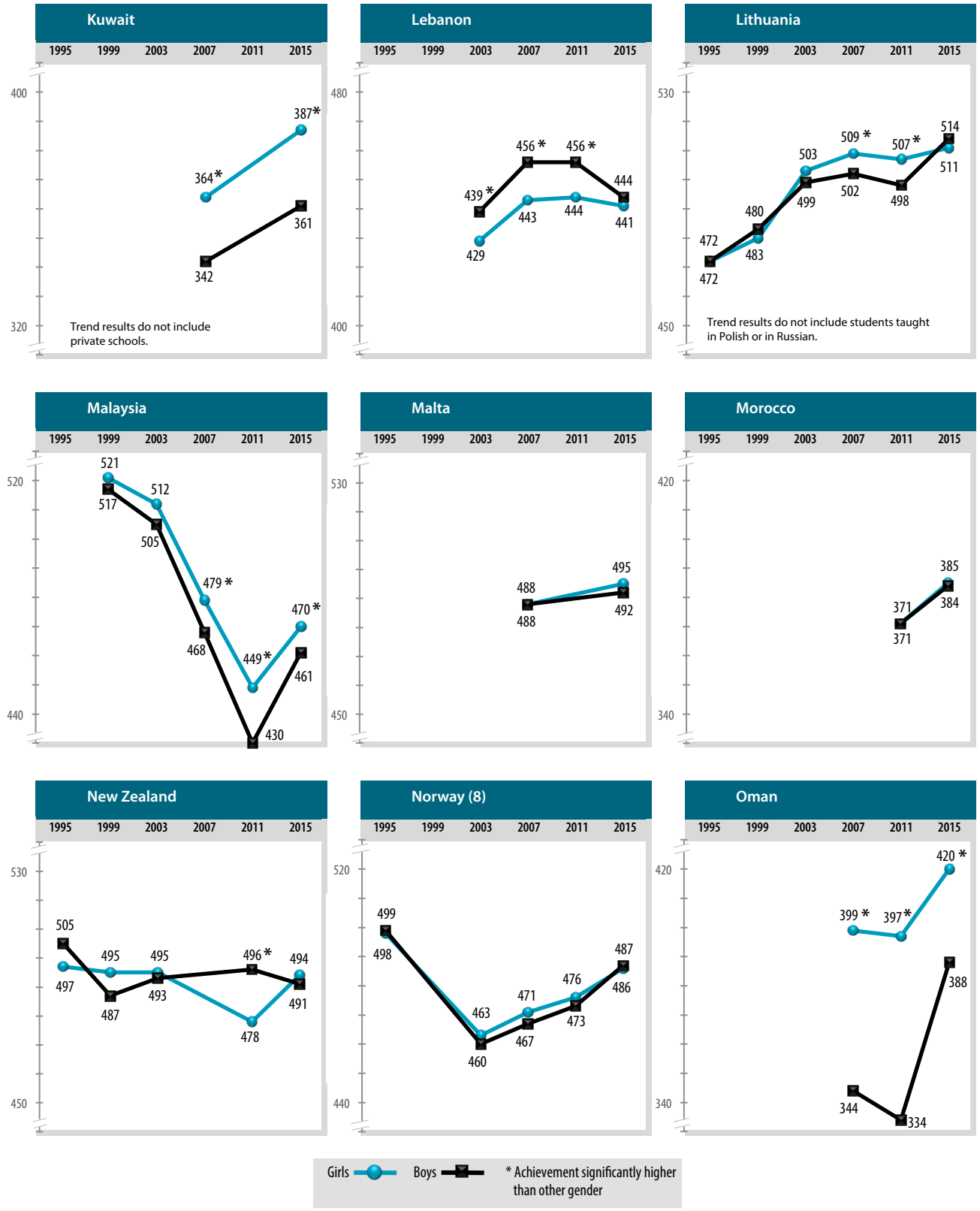
Exhibit 1.13: Trends in Mathematics Achievement by Gender (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

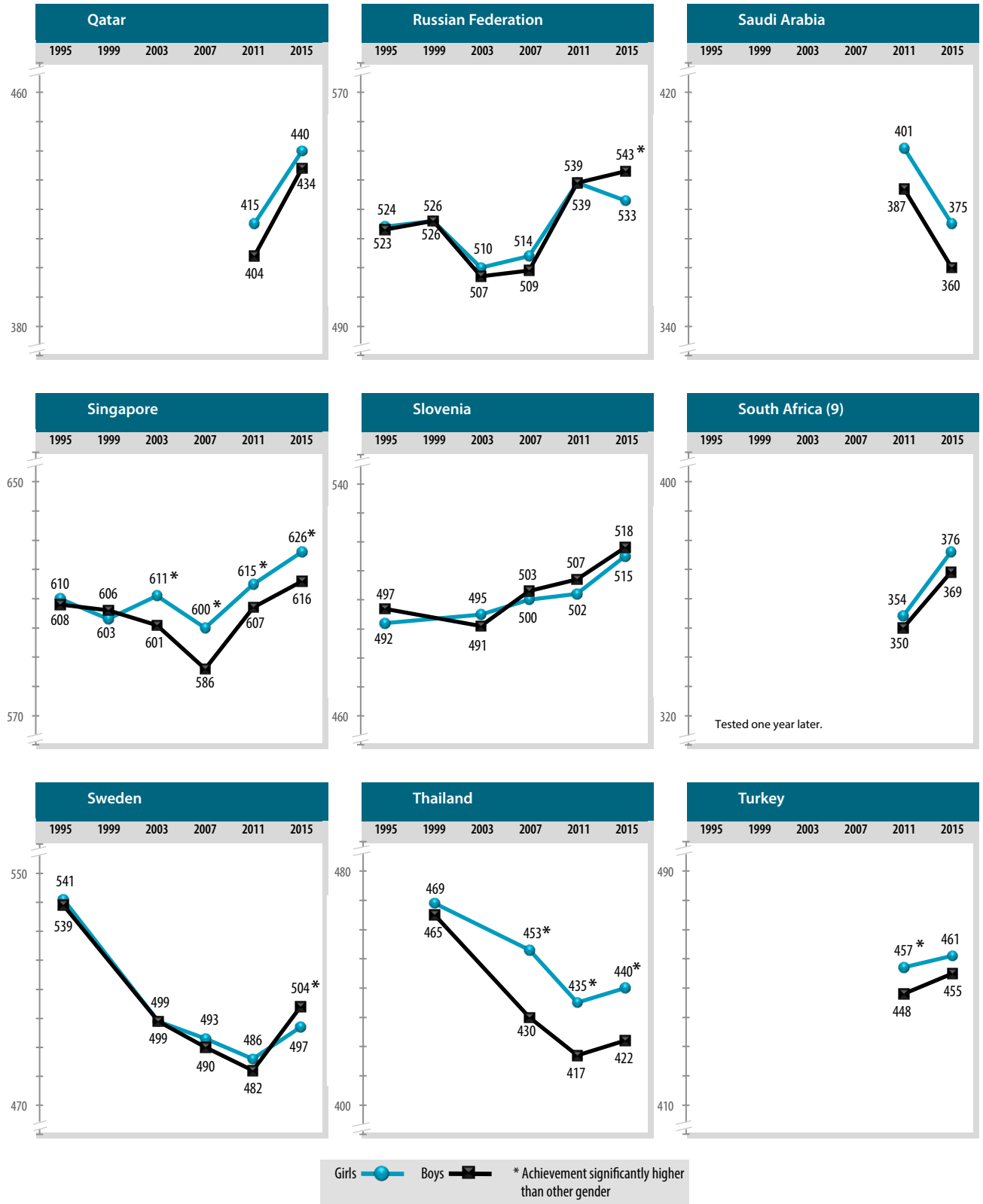
Exhibit 1.13: Trends in Mathematics Achievement by Gender (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

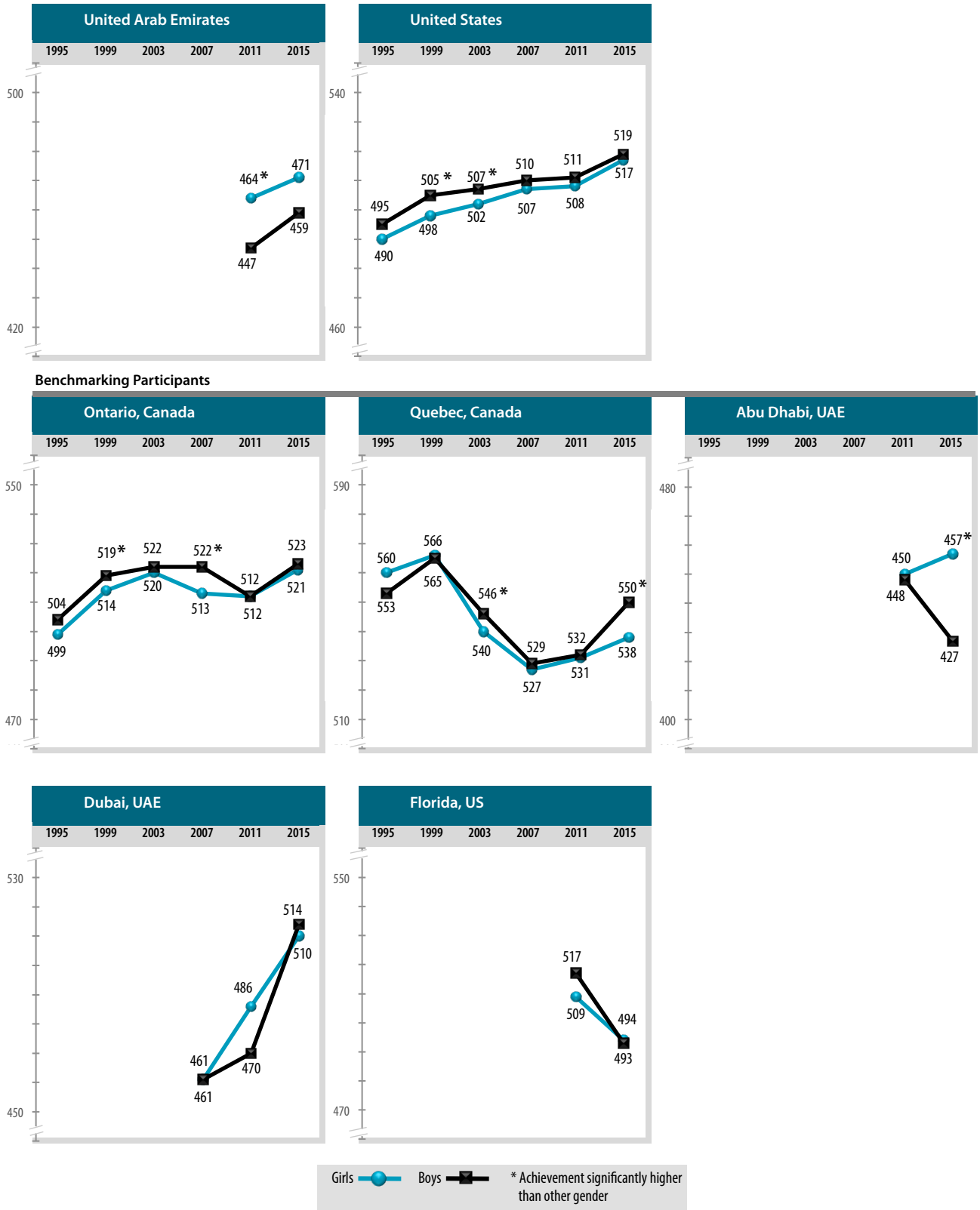
Exhibit 1.13: Trends in Mathematics Achievement by Gender (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 1.13: Trends in Mathematics Achievement by Gender (Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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TIMSS 2015

CHAPTER 2: PERFORMANCE AT INTERNATIONAL BENCHMARKS

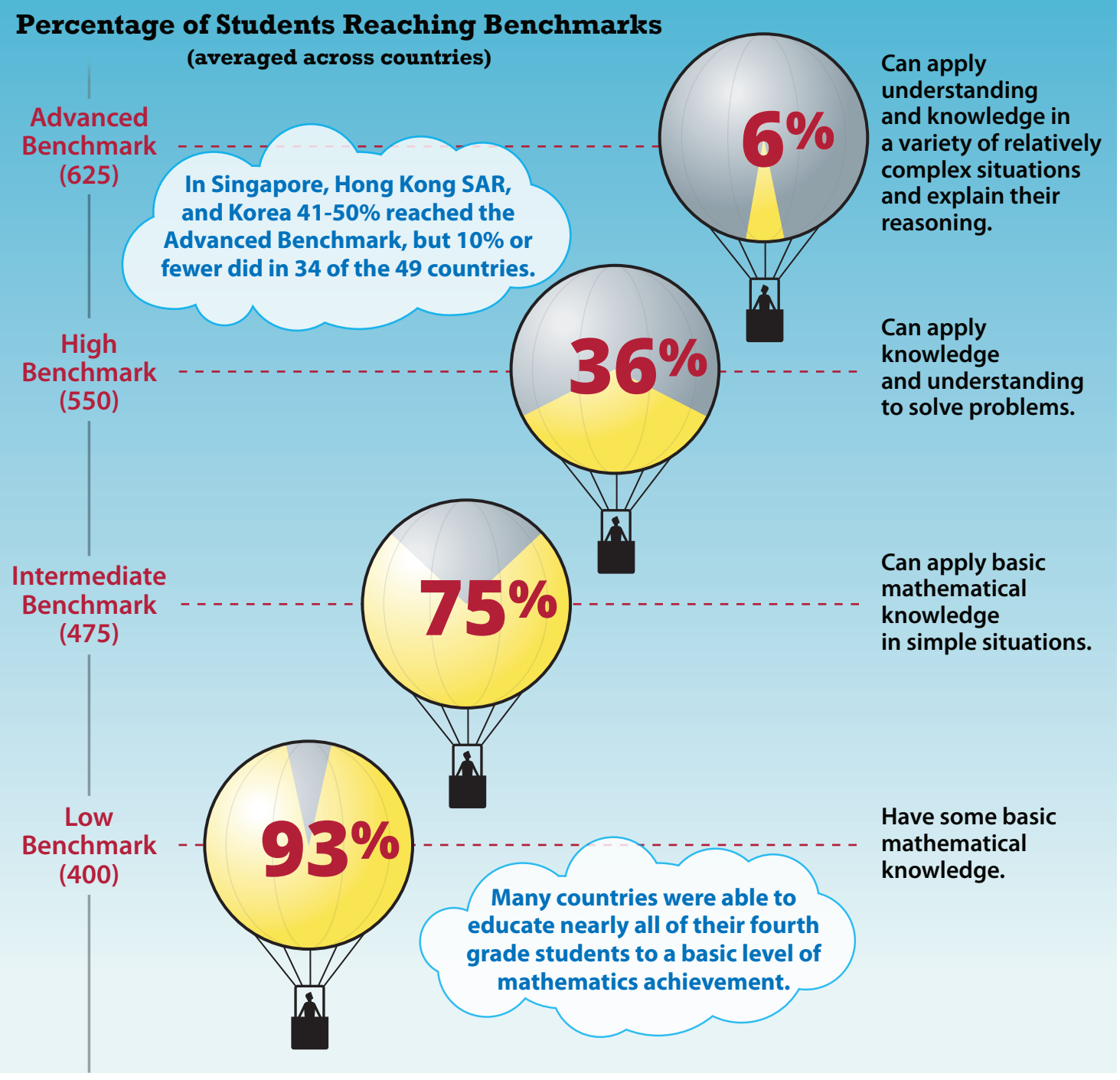
TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Achievement at TIMSS International Benchmarks

TIMSS describes achievement at four International Benchmarks along the mathematics achievement scale: Advanced, High, Intermediate, and Low.

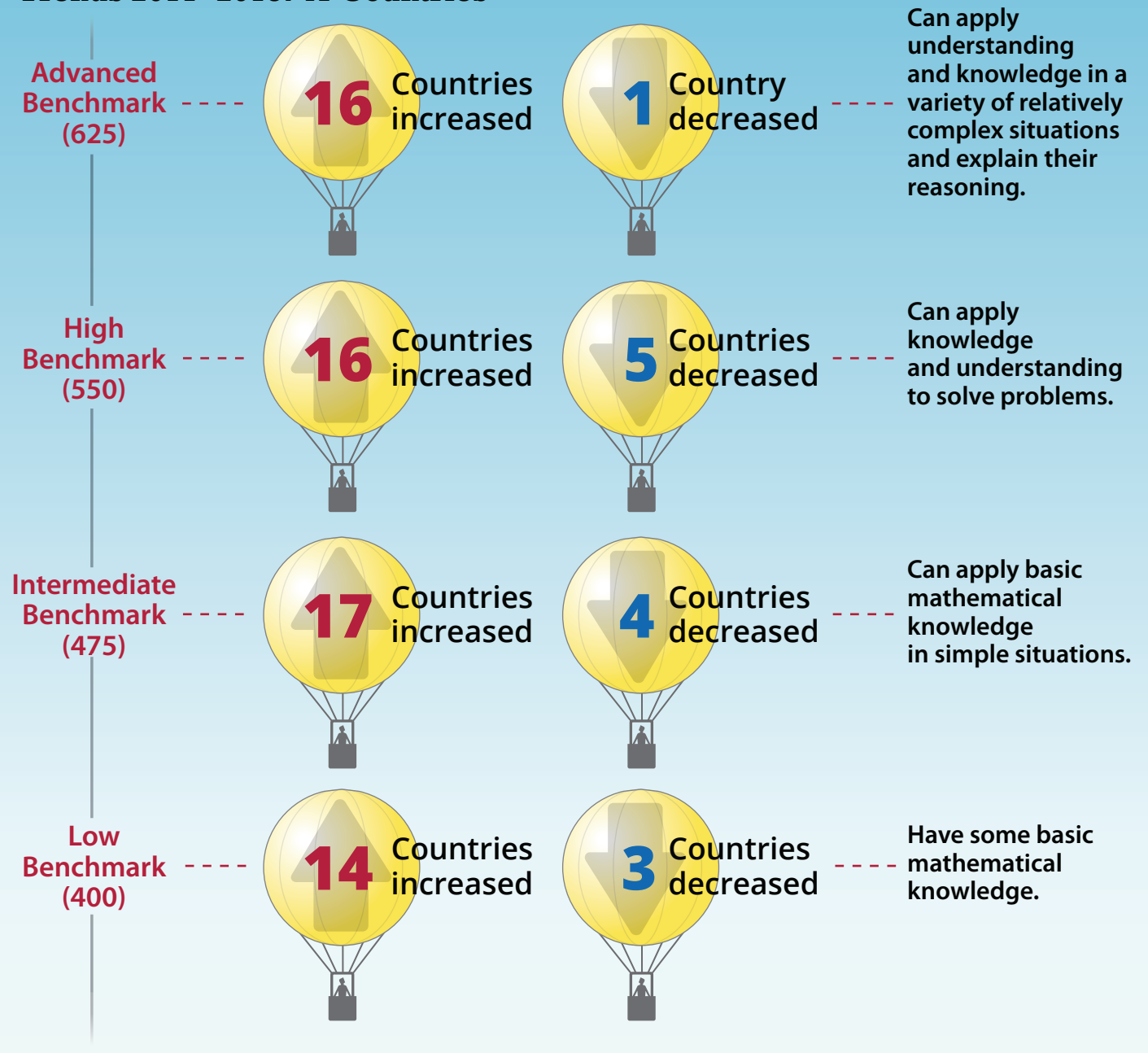
Percentage of Students Reaching Benchmarks
(averaged across countries)



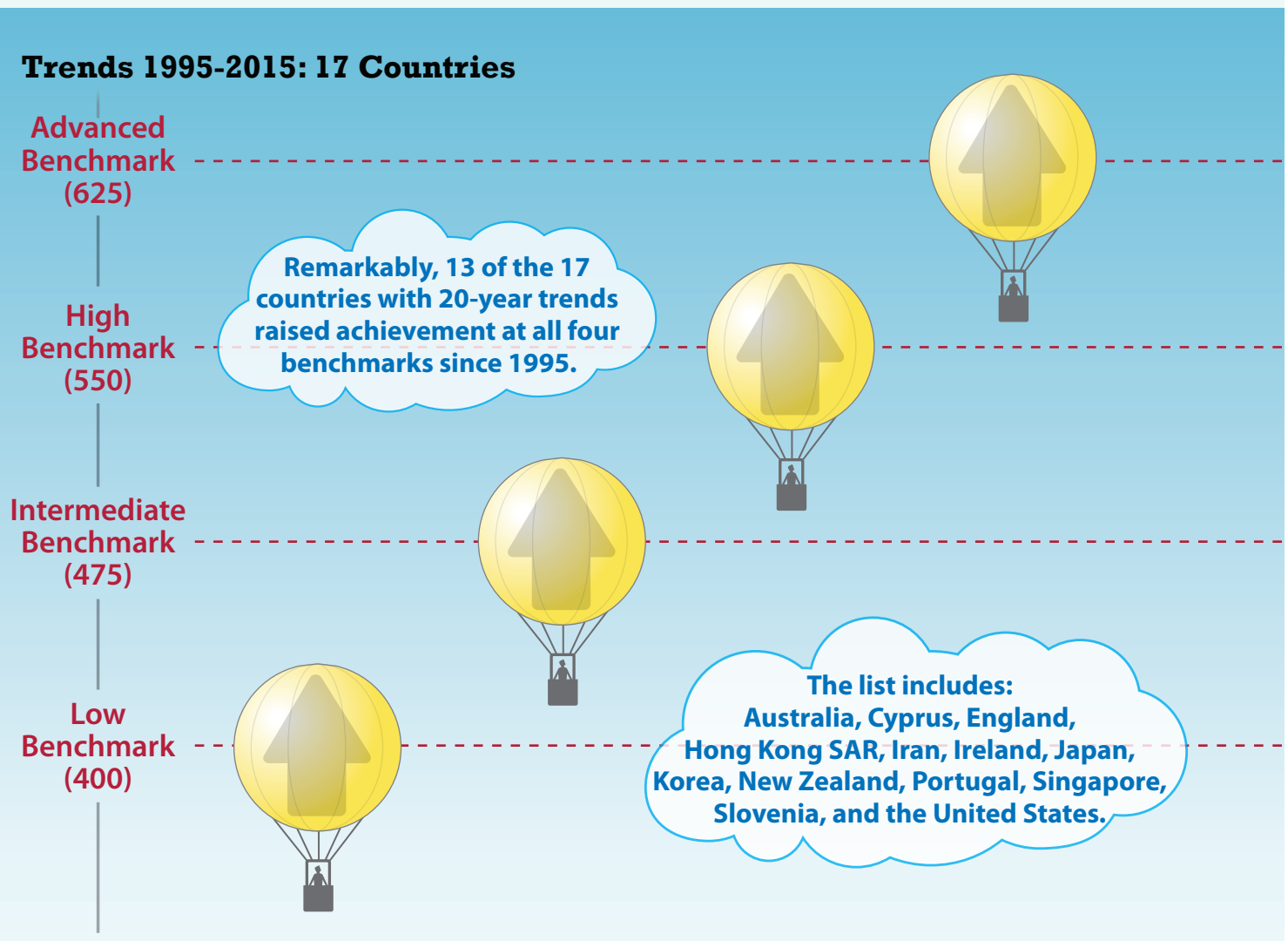
Trends at the TIMSS International Benchmarks

In general, there were more improvements across the International Benchmarks in 2015 than there were declines.

Trends 2011- 2015: 41 Countries



Trends 1995-2015: 17 Countries



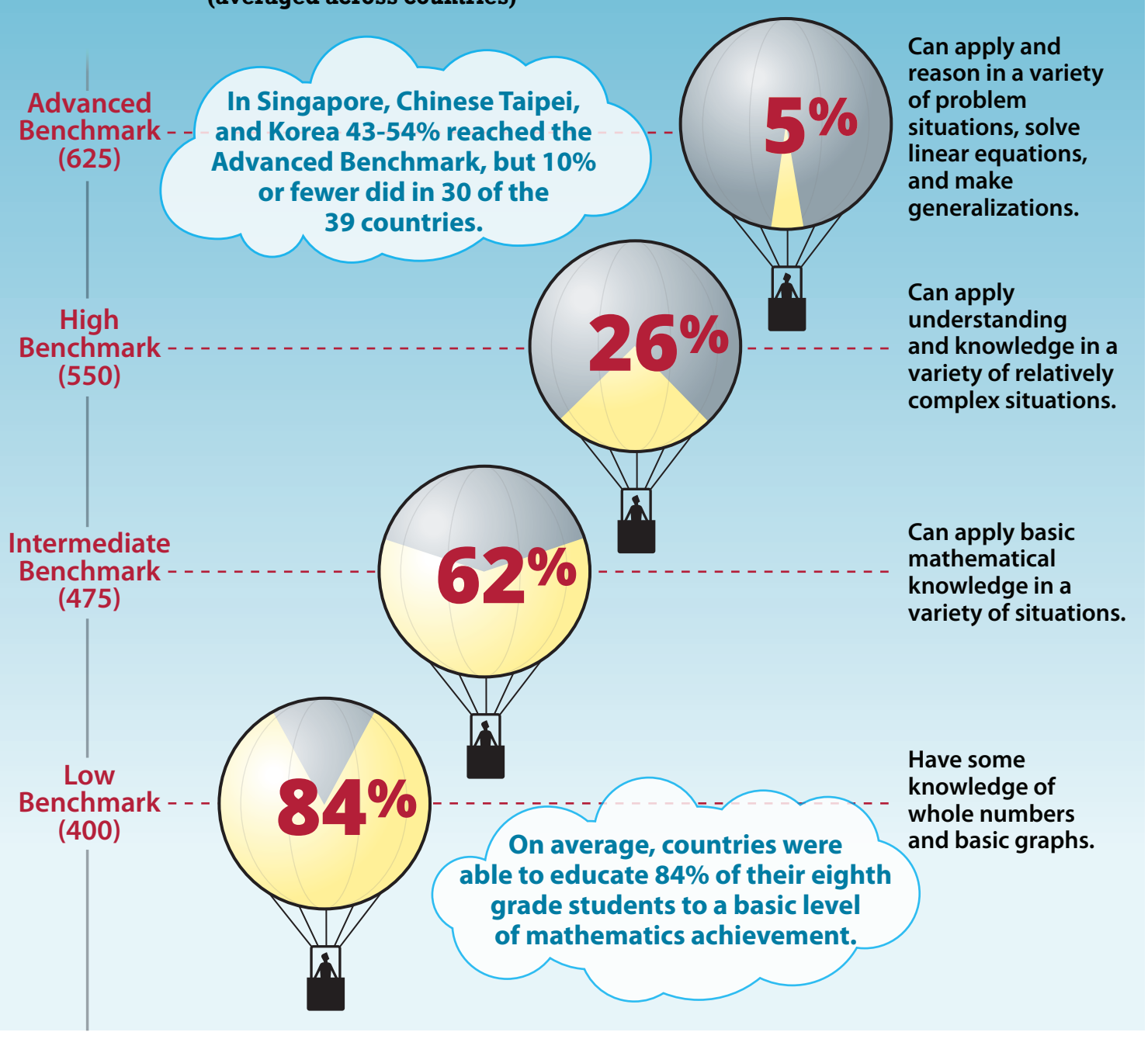
SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Achievement at TIMSS International Benchmarks

TIMSS describes achievement at four International Benchmarks along the mathematics achievement scale: Advanced, High, Intermediate, and Low.

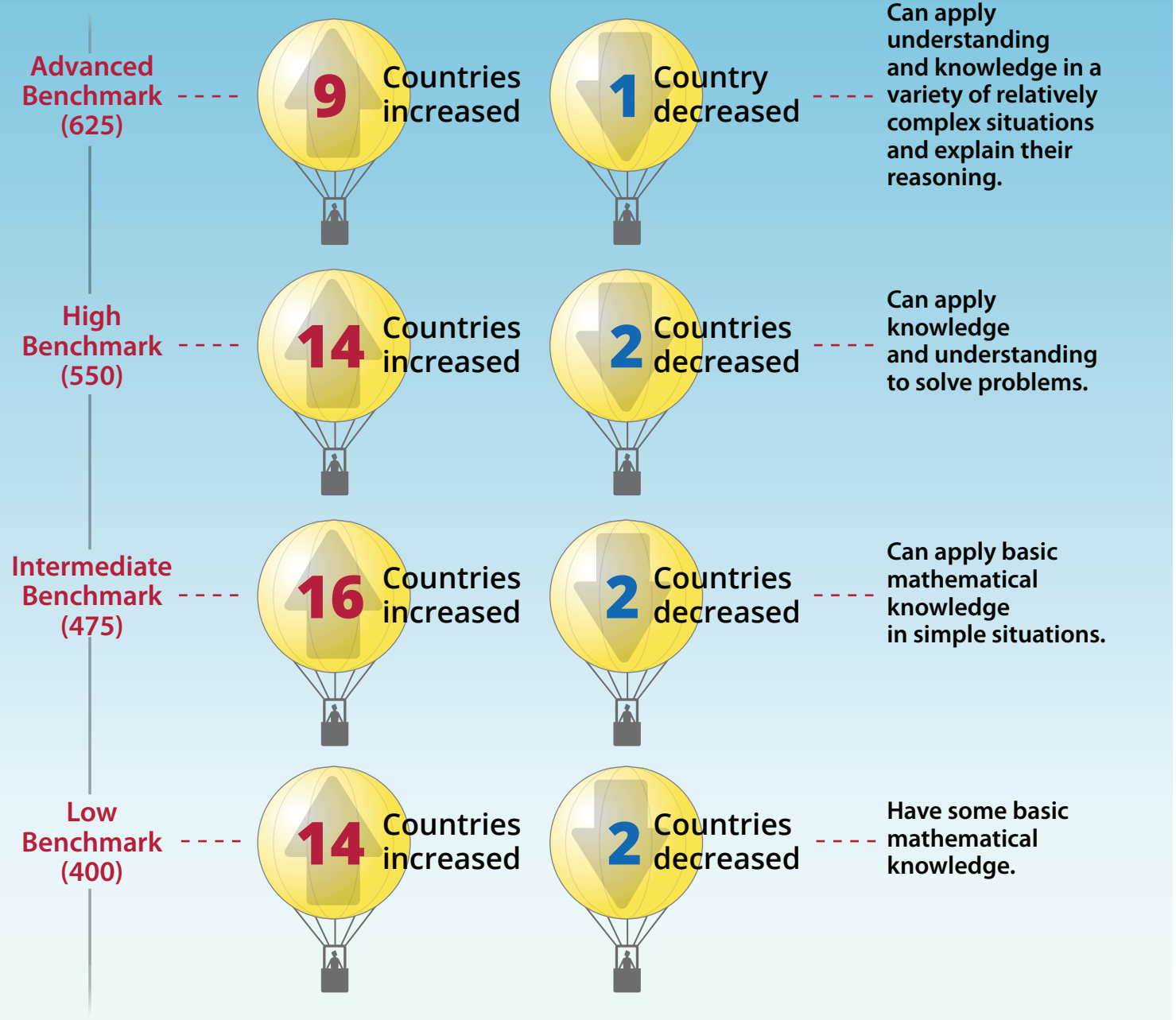
Percentage of Students Reaching Benchmarks
(averaged across countries)



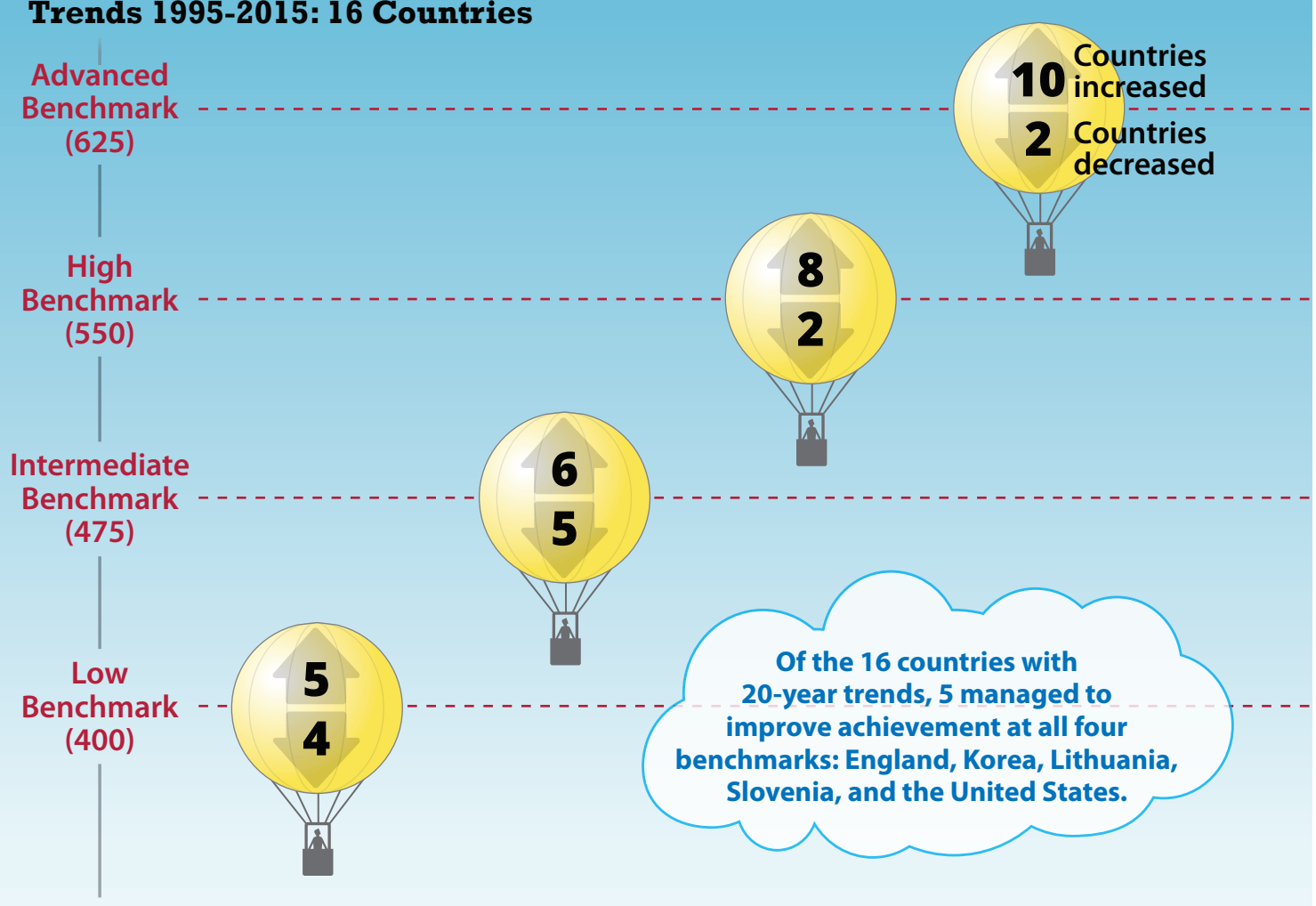
Trends at the TIMSS International Benchmarks

In general, there were more improvements across the International Benchmarks in 2015 than there were declines.

Trends 2011- 2015: 34 Countries



Trends 1995-2015: 16 Countries



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

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TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Exhibit 2.1: Descriptions of the TIMSS 2015 International Benchmarks of Mathematics Achievement

625 Advanced International Benchmark

Students can apply their understanding and knowledge in a variety of relatively complex situations and explain their reasoning. They can solve a variety of multi-step word problems involving whole numbers. Students at this level show an increasing understanding of fractions and decimals. They can apply knowledge of a range of two- and three-dimensional shapes in a variety of situations. They can interpret and represent data to solve multi-step problems.

550 High International Benchmark

Students can apply their knowledge and understanding to solve problems. They can solve word problems involving operations with whole numbers, simple fractions, and two-place decimals. Students demonstrate understanding of geometric properties of shapes and of angles that are less than or greater than a right angle. Students can interpret and use data in tables and a variety of graphs to solve problems.

475 Intermediate International Benchmark

Students can apply basic mathematical knowledge in simple situations. They demonstrate an understanding of whole numbers and some understanding of fractions and decimals. Students can relate two- and three-dimensional shapes and identify and draw shapes with simple properties. They can read and interpret bar graphs and tables.

400 Low International Benchmark

Students have some basic mathematical knowledge. They can add and subtract whole numbers, have some understanding of multiplication by one-digit numbers, and can solve simple word problems. They have some knowledge of simple fractions, geometric shapes, and measurement. Students can read and complete simple bar graphs and tables.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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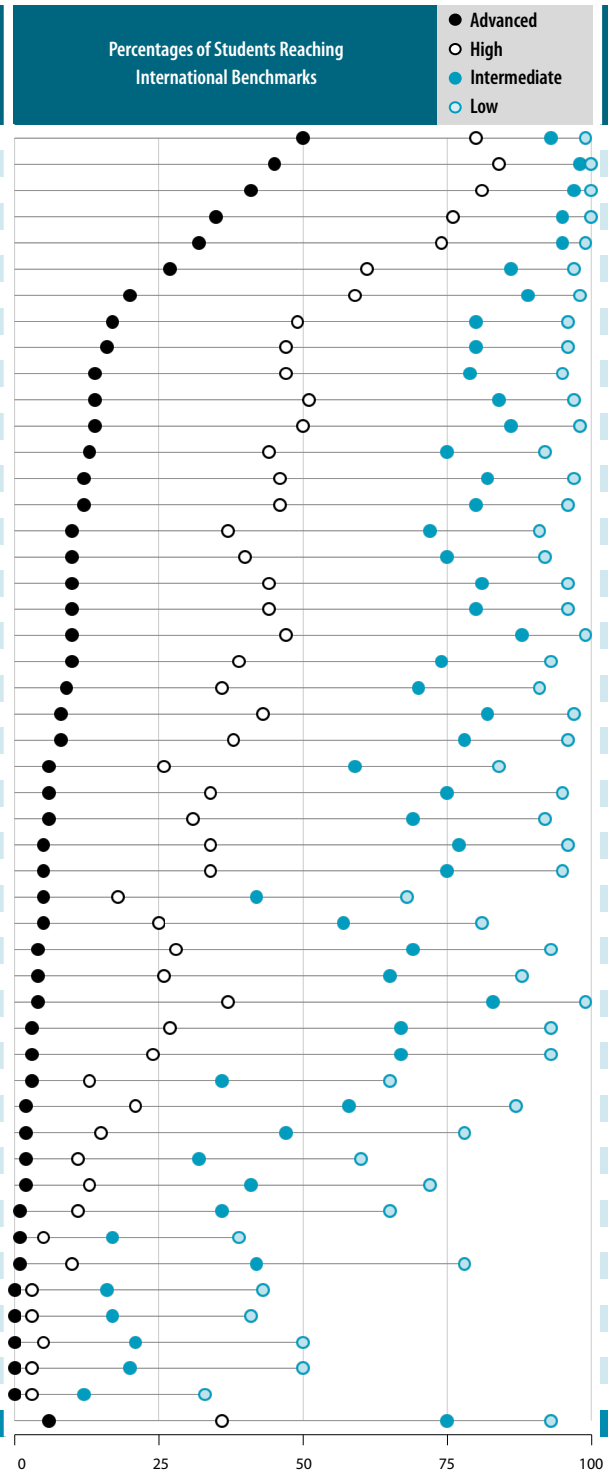
Exhibit 2.2: Performance at the International Benchmarks of Mathematics Achievement



Country	Advanced Benchmark (625)	High Benchmark (550)	Intermediate Benchmark (475)	Low Benchmark (400)
[2] Singapore	50 (2.1)	80 (1.7)	93 (0.9)	99 (0.3)
† Hong Kong SAR	45 (2.0)	84 (1.3)	98 (0.4)	100 (0.1)
Korea, Rep. of	41 (1.3)	81 (1.0)	97 (0.4)	100 (0.1)
Chinese Taipei	35 (1.5)	76 (1.0)	95 (0.4)	100 (0.2)
Japan	32 (1.1)	74 (1.0)	95 (0.4)	99 (0.1)
‡ Northern Ireland	27 (1.3)	61 (1.5)	86 (1.1)	97 (0.6)
Russian Federation	20 (1.8)	59 (1.8)	89 (1.1)	98 (0.4)
England	17 (1.2)	49 (1.5)	80 (1.2)	96 (0.7)
Kazakhstan	16 (1.8)	47 (2.6)	80 (1.5)	96 (0.5)
[2] † United States	14 (0.8)	47 (1.1)	79 (1.0)	95 (0.5)
Ireland	14 (1.0)	51 (1.6)	84 (1.0)	97 (0.4)
Norway (5)	14 (1.1)	50 (1.6)	86 (1.0)	98 (0.4)
Hungary	13 (0.9)	44 (1.5)	75 (1.5)	92 (0.9)
[2] Portugal	12 (0.9)	46 (1.3)	82 (1.1)	97 (0.4)
[2] † Denmark	12 (0.9)	46 (1.6)	80 (1.3)	96 (0.6)
[3] Serbia	10 (0.8)	37 (1.4)	72 (1.6)	91 (1.2)
Bulgaria	10 (1.3)	40 (2.6)	75 (2.1)	92 (1.3)
[2] Lithuania	10 (1.0)	44 (1.5)	81 (1.1)	96 (0.5)
Poland	10 (0.7)	44 (1.4)	80 (1.0)	96 (0.4)
† Belgium (Flemish)	10 (0.8)	47 (1.5)	88 (0.9)	99 (0.3)
Cyprus	10 (0.7)	39 (1.5)	74 (1.3)	93 (0.6)
Australia	9 (0.9)	36 (1.6)	70 (1.3)	91 (0.9)
Finland	8 (0.7)	43 (1.3)	82 (1.0)	97 (0.4)
Czech Republic	8 (0.7)	38 (1.4)	78 (1.1)	96 (0.5)
New Zealand	6 (0.5)	26 (0.9)	59 (1.2)	84 (0.9)
Slovenia	6 (0.5)	34 (1.4)	75 (1.2)	95 (0.5)
[1] [2] † Canada	6 (0.5)	31 (1.1)	69 (1.2)	92 (0.8)
Germany	5 (0.5)	34 (1.3)	77 (1.1)	96 (0.6)
[2] Sweden	5 (0.5)	34 (1.6)	75 (1.6)	95 (0.8)
United Arab Emirates	5 (0.4)	18 (0.8)	42 (1.0)	68 (0.9)
Turkey	5 (0.5)	25 (1.2)	57 (1.3)	81 (1.1)
[2] Italy	4 (0.6)	28 (1.3)	69 (1.4)	93 (0.8)
Slovak Republic	4 (0.4)	26 (1.1)	65 (1.4)	88 (0.9)
† Netherlands	4 (0.6)	37 (1.3)	83 (1.0)	99 (0.3)
[2] Spain	3 (0.4)	27 (1.1)	67 (1.4)	93 (0.9)
Croatia	3 (0.4)	24 (1.1)	67 (1.2)	93 (0.6)
Qatar	3 (0.5)	13 (1.1)	36 (1.4)	65 (1.4)
France	2 (0.3)	21 (1.3)	58 (1.8)	87 (1.0)
[1] Georgia	2 (0.6)	15 (1.4)	47 (1.7)	78 (1.6)
Oman	2 (0.3)	11 (0.6)	32 (1.1)	60 (1.0)
[2] Bahrain	2 (0.2)	13 (0.5)	41 (0.8)	72 (0.8)
Iran, Islamic Rep. of	1 (0.3)	11 (0.7)	36 (1.1)	65 (1.4)
South Africa (5)	1 (0.3)	5 (0.7)	17 (1.0)	39 (1.4)
Chile	1 (0.2)	10 (0.7)	42 (1.4)	78 (1.5)
ψ Saudi Arabia	0 (0.2)	3 (0.7)	16 (1.2)	43 (1.7)
Morocco	0 (0.1)	3 (0.5)	17 (1.1)	41 (1.6)
Jordan	0 (0.1)	5 (0.6)	21 (1.1)	50 (1.2)
Indonesia	0 (0.1)	3 (0.4)	20 (1.2)	50 (1.8)
ψ Kuwait	0 (0.1)	3 (0.5)	12 (1.2)	33 (1.7)
International Median	6	36	75	93

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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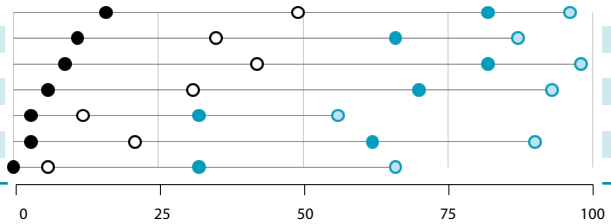
Exhibit 2.2: Performance at the International Benchmarks of Mathematics Achievement (Continued)

Country	Percentages of Students Reaching International Benchmarks (● Advanced, ○ High, ● Intermediate, ○ Low)	Advanced Benchmark (625)	High Benchmark (550)	Intermediate Benchmark (475)	Low Benchmark (400)
Benchmarking Participants					
[1] Florida, US		16 (2.1)	49 (2.7)	82 (1.7)	96 (0.7)
Dubai, UAE		11 (0.5)	35 (0.9)	66 (0.8)	87 (0.5)
‡ Quebec, Canada		9 (1.3)	42 (2.5)	82 (1.8)	98 (0.6)
Ontario, Canada		6 (0.6)	31 (1.4)	70 (1.3)	93 (0.6)
[2] ψ Abu Dhabi, UAE		3 (0.7)	12 (1.4)	32 (1.9)	56 (1.8)
Norway (4)		3 (0.4)	21 (1.1)	62 (1.5)	90 (1.1)
Buenos Aires, Argentina		0 (0.1)	6 (0.6)	32 (1.3)	66 (1.4)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.3: Percentages of Students Reaching the International Benchmarks of Mathematics Achievement Across Assessment Years

Country	Advanced International Benchmark (625) Percent of Students					High International Benchmark (550) Percent of Students				
	2015	2011	2007	2003	1995	2015	2011	2007	2003	1995
Singapore	50	43 ▲	41 ▲	38 ▲	38 ▲	80	78	74 ▲	73 ▲	70 ▲
Hong Kong SAR	45	37 ▲	40	22 ▲	17 ▲	84	80	81	67 ▲	56 ▲
Korea, Rep. of	41	39			25 ▲	81	80			70 ▲
Chinese Taipei	35	34	24 ▲	16 ▲		76	74	66 ▲	61 ▲	
Japan	32	30	23 ▲	21 ▲	22 ▲	74	70 ▲	61 ▲	60 ▲	61 ▲
Northern Ireland	27	24 ▲				61	59			
Russian Federation	20	13 ▲	16	11 ▲		59	47 ▲	48 ▲	41 ▲	
England	17	18	16	14	7 ▲	49	49	48	43 ▲	24 ▲
Kazakhstan	16	7 ▲				47	29 ▲			
United States	14	13	10 ▲	7 ▲	9 ▲	47	47	40 ▲	35 ▲	37 ▲
Ireland	14	9 ▲			10 ▲	51	41 ▲			40 ▲
Hungary	13	10 ▲	9 ▲	10 ▲	11	44	37 ▲	35 ▲	41	38 ▲
Portugal	12	8 ▲			1 ▲	46	40 ▲			11 ▲
Denmark	12	10	7 ▲			46	44	36 ▲		
Serbia	10	9				37	36			
Lithuania	10	10	10	10		45	43	42	44	
Belgium (Flemish)	10	10		10		47	50		51	
Cyprus	10			8 ▲	5 ▲	39			34 ▲	21 ▲
Australia	9	10	9	5 ▲	6 ▲	36	35	35	26 ▲	27 ▲
Finland	8	12 ▼				43	49 ▼			
Czech Republic	8	4 ▲	2 ▲		16 ▼	38	30 ▲	19 ▲		46 ▼
New Zealand	6	4 ▲	5	5	4 ▲	26	23 ▲	26	26	19 ▲
Slovenia	6	4 ▲	3 ▲	2 ▲	2 ▲	34	31	25 ▲	18 ▲	14 ▲
Germany	5	5	6			34	37	37		
Sweden	5	3 ▲	3 ▲			34	25 ▲	24 ▲		
United Arab Emirates	5	2 ▲				18	12 ▲			
Turkey	5	4				25	21 ▲			
Italy	4	5	6	6		28	28	29	29	
Slovak Republic	4	5	5			26	30 ▼	26		
Netherlands	4	5	7 ▼	5	12 ▼	37	44 ▼	42 ▼	44 ▼	50 ▼
Spain	3	1 ▲				27	17 ▲			
Norway (4)	3	2	2 ▲	1 ▲	2	21	21	15 ▲	10 ▲	16 ▲
Croatia	3	2 ▲				24	19 ▲			
Qatar	3	2				13	10 ▲			
Georgia	2	2	1			15	12	10 ▲		
Oman	2	1 ▲				11	5 ▲			
Bahrain	2	1				13	10 ▲			
Iran, Islamic Rep. of	1	1	0 ▲	0 ▲	0 ▲	11	9	3 ▲	2 ▲	3 ▲
Chile	1	2				10	14 ▼			
ψ Saudi Arabia	0	2				3	7 ▼			
Morocco	0	0				3	2			
ψ Kuwait	0	0				1	1			
Benchmarking Participants										
Florida, US	16	14				49	47			
Dubai, UAE	11	5 ▲	2 ▲			35	22 ▲	12 ▲		
Quebec, Canada	9	6	5 ▲	3 ▲	13 ▼	42	40	34 ▲	25 ▲	50
Ontario, Canada	6	7	4	5	4 ▲	31	34	29	29	22 ▲
ψ Abu Dhabi, UAE	3	1 ▲				12	8 ▲			

▲ 2015 percent significantly higher

▼ 2015 percent significantly lower

An empty cell indicates a country did not participate in that year's assessment.

Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish or in Russian.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.3: Percentages of Students Reaching the International Benchmarks of Mathematics Achievement Across Assessment Years (Continued)

Country	Intermediate International Benchmark (475) Percent of Students					Low International Benchmark (400) Percent of Students				
	2015	2011	2007	2003	1995	2015	2011	2007	2003	1995
Singapore	93	94	92	91	89 ▲	99	99	98	97	96 ▲
Hong Kong SAR	98	96	97	94 ▲	87 ▲	100	99	100	99 ▲	97 ▲
Korea, Rep. of	97	97			94 ▲	100	100			99 ▲
Chinese Taipei	95	93 ▲	92 ▲	92 ▲		100	99	99 ▲	99 ▲	
Japan	95	93 ▲	89 ▲	89 ▲	89 ▲	99	99	98 ▲	98 ▲	98 ▲
Northern Ireland	86	85				97	96			
Russian Federation	89	82 ▲	81 ▲	76 ▲		98	97 ▲	95 ▲	95 ▲	
England	80	78	79	75 ▲	54 ▲	96	93 ▲	94	93 ▲	82 ▲
Kazakhstan	80	62 ▲				96	88 ▲			
United States	79	81	77	72 ▲	71 ▲	95	96 ▼	95	93 ▲	92 ▲
Ireland	84	77 ▲			73 ▲	97	94 ▲			91 ▲
Hungary	75	70 ▲	67 ▲	76	72	92	90	88 ▲	94 ▼	91
Portugal	82	80			37 ▲	97	97			70 ▲
Denmark	80	82	76 ▲			96	97	95		
Serbia	72	70				91	90			
Lithuania	81	79	77 ▲	79		96	96	94 ▲	96	
Belgium (Flemish)	88	89		90		99	99		99	
Cyprus	74			68 ▲	52 ▲	93			89 ▲	79 ▲
Australia	70	70	71	64 ▲	61 ▲	91	90	91	88 ▲	86 ▲
Finland	82	85				97	98			
Czech Republic	78	72 ▲	59 ▲		79	96	93 ▲	88 ▲		95
New Zealand	59	58	61	61	51 ▲	84	85	85	86	78 ▲
Slovenia	75	72	67 ▲	55 ▲	45 ▲	95	94	92 ▲	84 ▲	77 ▲
Germany	77	81 ▼	78			96	97	96		
Sweden	75	69 ▲	68 ▲			95	93	93		
United Arab Emirates	42	35 ▲				68	64 ▲			
Turkey	57	51 ▲				81	77 ▲			
Italy	69	69	67	65		93	93	91	89 ▲	
Slovak Republic	65	69	63			88	90	88		
Netherlands	83	88 ▼	84	89 ▼	87 ▼	99	99	98	99	99
Spain	67	56 ▲				93	87 ▲			
Norway (4)	62	63	52 ▲	41 ▲	53 ▲	90	91	83 ▲	75 ▲	84 ▲
Croatia	67	60 ▲				93	90 ▲			
Qatar	36	29 ▲				65	55 ▲			
Georgia	47	41 ▲	35 ▲			78	72 ▲	67 ▲		
Oman	32	20 ▲				60	46 ▲			
Bahrain	41	34 ▲				72	67 ▲			
Iran, Islamic Rep. of	36	33	20 ▲	17 ▲	15 ▲	65	64	53 ▲	45 ▲	44 ▲
Chile	42	44				78	77			
ψ Saudi Arabia	16	24 ▼				43	55 ▼			
Morocco	17	10 ▲				41	26 ▲			
ψ Kuwait	7	9 ▼				23	30 ▼			
Benchmarking Participants										
Florida, US	82	83				96	97			
Dubai, UAE	66	50 ▲	37 ▲			87	75 ▲	69 ▲		
Quebec, Canada	82	83	74 ▲	69 ▲	87 ▼	98	99	96 ▲	94 ▲	98
Ontario, Canada	70	73	71	70	59 ▲	93	94	94	94	86 ▲
ψ Abu Dhabi, UAE	32	29				56	58			

▲ 2015 percent significantly higher

▼ 2015 percent significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.4: Description of the TIMSS 2015 Low International Benchmark (400) of Mathematics Achievement

400 Low International Benchmark

Summary

Students have some basic mathematical knowledge. They can add and subtract whole numbers, have some understanding of multiplication by one-digit numbers, and can solve simple word problems. They have some knowledge of simple fractions, geometric shapes, and measurement. Students can read and complete simple bar graphs and tables.

Students at this level are familiar with numbers into the thousands. They can add and subtract whole numbers, have some understanding of multiplication by one-digit numbers, and can solve simple word problems. They can recognize pictorial representations of simple fractions.

Students have some recognition of simple two- and three-dimensional shapes and basic measurement ideas.

Students can read and complete simple bar graphs and tables.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.4.1: Low International Benchmark – Example Item 1

Country	Percent Correct
Chinese Taipei	98 (0.6) ▲
Russian Federation	98 (0.7) ▲
Japan	98 (0.6) ▲
Korea, Rep. of	96 (0.8) ▲
Czech Republic	96 (0.8) ▲
† Hong Kong SAR	96 (0.9) ▲
2 Spain	96 (1.0) ▲
2 Lithuania	95 (1.1) ▲
2 Portugal	94 (0.9) ▲
France	94 (1.2) ▲
Croatia	94 (1.2) ▲
† Belgium (Flemish)	94 (0.9) ▲
Norway (5)	94 (1.2) ▲
3 Serbia	94 (1.5) ▲
Poland	94 (1.2) ▲
2 Singapore	94 (1.0) ▲
† Netherlands	93 (1.3) ▲
Kazakhstan	93 (1.3) ▲
Ireland	93 (1.3) ▲
England	93 (1.1) ▲
‡ Northern Ireland	92 (1.4) ▲
Finland	92 (1.2) ▲
2 † United States	92 (0.8) ▲
Chile	92 (1.1) ▲
Germany	92 (1.3) ▲
Cyprus	92 (1.2) ▲
2 Italy	91 (1.4) ▲
Bulgaria	91 (1.5) ▲
Hungary	91 (1.7) ▲
2 Sweden	91 (1.4) ▲
Slovenia	90 (1.3) ▲
Australia	89 (1.3)
Slovak Republic	88 (1.5)
2 † Denmark	88 (1.7)
New Zealand	87 (1.2)
International Avg.	87 (0.2)
1 Georgia	87 (1.8)
1 2 † Canada	87 (1.1)
Turkey	85 (1.7)
United Arab Emirates	77 (1.2) ▼
Qatar	74 (1.9) ▼
2 Bahrain	72 (1.8) ▼
Oman	66 (1.8) ▼
Morocco	62 (2.6) ▼
Indonesia	59 (2.7) ▼
Kuwait	58 (2.5) ▼
Saudi Arabia	58 (2.2) ▼
Iran, Islamic Rep. of	57 (3.2) ▼
Jordan	- -
South Africa (5)	- -

Content Domain: Number
Cognitive Domain: Knowing
Description: Identifies a four-digit number given in words

Three thousand twenty three can be written as:

Ⓐ 323
● 3,023
Ⓒ 30,023
Ⓓ 300,023

Country	Percent Correct
Benchmarking Participants	
1 Florida, US	94 (1.3) ▲
‡ Quebec, Canada	91 (1.8) ▲
Dubai, UAE	89 (1.1)
Ontario, Canada	86 (1.7)
Norway (4)	84 (2.1)
Buenos Aires, Argentina	83 (1.8) ▼
2 Abu Dhabi, UAE	72 (2.5) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.4.2: Low International Benchmark – Example Item 2*

Country	Percent Full Credit
Iran, Islamic Rep. of	64 (2.2) ▲
Morocco	63 (1.7) ▲
[2] Bahrain	62 (1.4) ▲
Indonesia	57 (2.0)
International Avg.	53 (0.7)
Jordan	50 (1.3) ▼
South Africa (5)	41 (1.3) ▼
Kuwait	38 (1.9) ▼
Benchmarking Participants	
Buenos Aires, Argentina	74 (1.2) ▲

Content Domain: Number
Cognitive Domain: Knowing
Description: Multiplies a three-digit number by a one-digit number

$512 \times 3 =$

Answer: 1536

The answer shown illustrates the type of response that would receive full credit (1 point).

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

* Item administered only in TIMSS Numeracy.

See Appendix C.1 for target population coverage notes 1, 2, and 3.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.4.3: Low International Benchmark – Example Item 3*

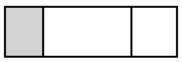
Country	Percent Correct
[2] Bahrain	83 (0.8) ▲
Iran, Islamic Rep. of	82 (1.5) ▲
Jordan	65 (1.2)
International Avg.	64 (0.6)
Indonesia	62 (1.7)
Kuwait	62 (2.1)
South Africa (5)	61 (1.2) ▼
Morocco	33 (1.4) ▼
Benchmarking Participants	
Buenos Aires, Argentina	72 (2.0) ▲

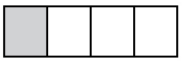
Content Domain: Number
Cognitive Domain: Knowing
Description: Recognizes a unit fraction represented pictorially

Which rectangle is $\frac{1}{3}$ shaded?

Ⓐ

●

Ⓒ 

Ⓓ 

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

* Item administered only in TIMSS Numeracy.

See Appendix C.1 for target population coverage notes 1, 2, and 3.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

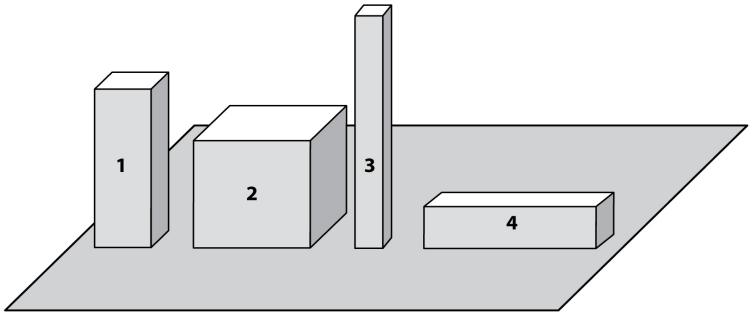
Downloaded from timss2015.org/download-center

Exhibit 2.4.4: Low International Benchmark – Example Item 4*

Country	Percent Correct
Indonesia	91 (1.0) ▲
[2] Bahrain	85 (0.9) ▲
Iran, Islamic Rep. of	74 (1.5) ▲
International Avg.	71 (0.5)
Jordan	70 (1.1)
Kuwait	63 (1.7) ▼
Morocco	58 (1.7) ▼
South Africa (5)	56 (1.4) ▼
Benchmarking Participants	
Buenos Aires, Argentina	73 (1.6)

Content Domain: Geometric Shapes and Measures
Cognitive Domain: Knowing
Description: Identifies the greatest volume of four rectangular prisms represented pictorially

John put 4 boxes on a table, as shown below.



Which box holds the most?

Ⓐ Box 1
● Box 2
Ⓒ Box 3
Ⓓ Box 4

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

* Item administered only in TIMSS Numeracy.

See Appendix C.1 for target population coverage notes 1, 2, and 3.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

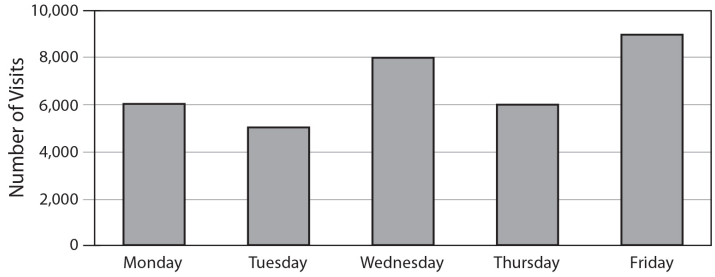
SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.4.5: Low International Benchmark – Example Item 5

Country	Percent Full Credit
Korea, Rep. of	98 (0.6) ▲
Chinese Taipei	96 (1.0) ▲
† Hong Kong SAR	96 (1.0) ▲
England	96 (1.0) ▲
Japan	96 (0.9) ▲
Norway (5)	94 (1.0) ▲
Ireland	94 (1.1) ▲
2 Singapore	93 (1.0) ▲
† Belgium (Flemish)	93 (0.9) ▲
† Netherlands	93 (1.2) ▲
Germany	93 (1.0) ▲
‡ Northern Ireland	92 (1.5) ▲
2 Portugal	91 (1.1) ▲
Russian Federation	91 (1.3) ▲
Croatia	91 (1.6) ▲
Finland	90 (1.4) ▲
Australia	90 (1.3) ▲
Poland	90 (1.2) ▲
2 † United States	90 (1.0) ▲
2 Sweden	89 (1.6) ▲
2 Lithuania	88 (1.5) ▲
Czech Republic	88 (1.4) ▲
1 2 † Canada	87 (0.9) ▲
2 † Denmark	87 (1.6)
New Zealand	87 (1.3) ▲
2 Spain	87 (1.3) ▲
Hungary	86 (1.6)
3 Serbia	86 (1.9)
Slovenia	85 (1.7)
France	85 (1.9)
2 Bahrain	84 (1.6)
International Avg.	84 (0.2)
Bulgaria	82 (2.5)
2 Italy	81 (1.9)
Slovak Republic	81 (1.8)
Cyprus	81 (1.8)
Turkey	79 (1.8) ▼
United Arab Emirates	79 (1.0) ▼
Kazakhstan	79 (1.8) ▼
Chile	78 (1.7) ▼
Qatar	78 (1.8) ▼
Oman	69 (1.7) ▼
Saudi Arabia	65 (2.0) ▼
Indonesia	64 (2.8) ▼
1 Georgia	58 (2.1) ▼
Iran, Islamic Rep. of	57 (2.6) ▼
Kuwait	54 (2.3) ▼
Morocco	47 (2.3) ▼
Jordan	- -
South Africa (5)	- -

Content Domain: Data Display
Cognitive Domain: Knowing
Description: Reads data from a bar graph



The chart shows the number of visits to the "Find the Answer" website.

How many visits were there on Wednesday?

Answer: 8,000

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	92 (1.7) ▲
Dubai, UAE	90 (1.1) ▲
Ontario, Canada	88 (1.3) ▲
1 Florida, US	86 (2.6)
Norway (4)	84 (1.7)
2 Abu Dhabi, UAE	74 (2.2) ▼
Buenos Aires, Argentina	61 (2.4) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.5: Description of the TIMSS 2015 Intermediate International Benchmark (475) of Mathematics Achievement

475 Intermediate International Benchmark

Summary

Students can apply basic mathematical knowledge in simple situations. They demonstrate an understanding of whole numbers and some understanding of fractions and decimals. Students can relate two- and three-dimensional shapes and identify and draw shapes with simple properties. They can read and interpret bar graphs and tables.

Students at this level demonstrate an understanding of whole numbers. They can add and subtract as well as multiply and divide by one-digit numbers in a variety of situations, including problems involving two steps. Students have some basic understanding of fractions and decimals. They can identify expressions representing simple situations.

Students can relate two- and three-dimensional shapes and compare volumes made with cubes. They can identify and draw shapes with simple properties, including right angles.

Students can read and interpret information in bar graphs and tables.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.5.1: Intermediate International Benchmark – Example Item 1*

Country	Percent Correct
Iran, Islamic Rep. of	57 (1.7) ▲
[2] Bahrain	50 (1.2) ▲
Indonesia	47 (1.8) ▲
International Avg.	42 (0.6)
Jordan	41 (1.4)
South Africa (5)	38 (1.0) ▼
Kuwait	33 (1.6) ▼
Morocco	26 (1.4) ▼
Benchmarking Participants	
Buenos Aires, Argentina	60 (1.6) ▲

Content Domain: Number
Cognitive Domain: Applying
Description: Solves a two-step word problem involving subtraction and division

Jeb had 16 peaches.

He gave away 4 peaches.

Then Jeb divided the remaining peaches equally between 2 baskets.

How many peaches did Jeb put in each basket?

● 6
Ⓑ 8
Ⓒ 10
Ⓓ 12

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

* Item administered only in TIMSS Numeracy.

See Appendix C.1 for target population coverage notes 1, 2, and 3.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.5.2: Intermediate International Benchmark – Example Item 2

Country	Percent Full Credit
[2] Singapore	89 (1.0) ▲
Korea, Rep. of	89 (1.7) ▲
‡ Northern Ireland	87 (1.8) ▲
Russian Federation	85 (1.8) ▲
England	84 (1.9) ▲
[2] Portugal	84 (1.3) ▲
Ireland	81 (1.9) ▲
† Hong Kong SAR	80 (1.9) ▲
Finland	80 (2.2) ▲
Japan	79 (1.5) ▲
[2] † United States	78 (1.3) ▲
Cyprus	78 (1.8) ▲
Norway (5)	78 (1.9) ▲
Czech Republic	76 (1.9) ▲
† Netherlands	76 (2.2) ▲
Kazakhstan	76 (1.6) ▲
Australia	75 (1.8) ▲
Croatia	75 (2.1) ▲
† Belgium (Flemish)	75 (1.5) ▲
Iran, Islamic Rep. of	74 (1.4) ▲
[2] Spain	74 (1.7) ▲
[3] Serbia	74 (2.4) ▲
Turkey	74 (1.5) ▲
Chinese Taipei	73 (2.0) ▲
Hungary	73 (1.9) ▲
Germany	72 (1.9)
[1 2] † Canada	72 (1.5)
[2] † Denmark	71 (2.0)
Poland	71 (2.1)
[2] Sweden	69 (2.7)
International Avg.	69 (0.3)
[1] Georgia	68 (2.5)
Bulgaria	68 (2.6)
Slovenia	68 (2.1)
New Zealand	66 (1.9)
[2] Lithuania	65 (2.3)
[2] Bahrain	65 (1.3) ▼
[2] Italy	65 (2.4)
Slovak Republic	64 (1.9) ▼
South Africa (5)	60 (1.3) ▼
Chile	60 (2.2) ▼
France	59 (2.4) ▼
United Arab Emirates	58 (1.3) ▼
Qatar	52 (2.3) ▼
Indonesia	51 (1.8) ▼
Saudi Arabia	50 (2.3) ▼
Oman	48 (1.7) ▼
Jordan	44 (1.7) ▼
Kuwait	31 (1.7) ▼
Morocco	23 (1.6) ▼

Content Domain: Number
Cognitive Domain: Knowing
Description: Generates the next term in a well defined number pattern

Hanif starts to write a number pattern:

6, 13, 20, 27, …

He adds the same number each time to get the next number.

What is the next number he should write in his pattern?

Answer: 34

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
[1] Florida, US	82 (2.7) ▲
‡ Quebec, Canada	76 (2.7) ▲
Ontario, Canada	74 (2.1) ▲
Dubai, UAE	72 (1.4)
Norway (4)	68 (2.2)
[2] Abu Dhabi, UAE	52 (2.5) ▼
Buenos Aires, Argentina	50 (1.7) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

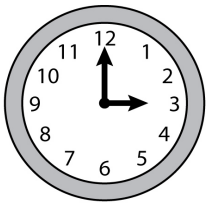
SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.5.3: Intermediate International Benchmark – Example Item 3

Country	Percent Correct
Korea, Rep. of	97 (0.8) ▲
† Hong Kong SAR	93 (1.4) ▲
Chinese Taipei	92 (1.0) ▲
2 Singapore	89 (1.2) ▲
Japan	88 (1.4) ▲
Poland	84 (1.7) ▲
Finland	83 (1.6) ▲
Russian Federation	82 (1.6) ▲
Croatia	82 (2.0) ▲
2 Portugal	81 (1.6) ▲
2 Spain	80 (2.1) ▲
‡ Northern Ireland	79 (1.9) ▲
2 Italy	79 (1.9) ▲
Kazakhstan	79 (1.9) ▲
Cyprus	79 (2.0) ▲
2 Lithuania	77 (2.1) ▲
Norway (5)	77 (1.8) ▲
Bulgaria	75 (2.2) ▲
2 † United States	75 (1.5) ▲
Slovenia	75 (2.0) ▲
Ireland	75 (2.2) ▲
Hungary	74 (2.1) ▲
England	73 (2.3) ▲
3 Serbia	73 (2.4) ▲
Germany	73 (2.3) ▲
† Netherlands	72 (2.1) ▲
France	71 (2.4)
Turkey	71 (2.1)
2 Sweden	69 (2.5)
† Belgium (Flemish)	69 (2.0)
International Avg.	68 (0.3)
Czech Republic	65 (2.1)
1 Georgia	65 (2.8)
2 † Denmark	64 (2.7)
Iran, Islamic Rep. of	64 (1.6) ▼
Australia	62 (2.4) ▼
1 2 † Canada	59 (2.1) ▼
Chile	56 (2.1) ▼
2 Bahrain	55 (1.2) ▼
Slovak Republic	55 (2.2) ▼
Jordan	47 (1.2) ▼
United Arab Emirates	47 (1.3) ▼
Oman	46 (1.6) ▼
New Zealand	45 (2.4) ▼
Qatar	43 (2.4) ▼
Saudi Arabia	43 (2.3) ▼
Indonesia	41 (1.4) ▼
Morocco	41 (1.5) ▼
Kuwait	29 (1.4) ▼
South Africa (5)	23 (1.0) ▼

Content Domain: Geometric Shapes and Measures
Cognitive Domain: Applying
Description: Identifies a time when the hands of a clock form a right angle



The hands of a clock at 3:00 are at a right angle. Which is another time that the hands are at a right angle?

Ⓐ 3:15
Ⓑ 3:45
● 9:00
Ⓓ 9:45

Country	Percent Correct
Benchmarking Participants	
1 Florida, US	80 (2.3) ▲
‡ Quebec, Canada	74 (2.9) ▲
Norway (4)	69 (2.1)
Dubai, UAE	63 (1.5) ▼
Ontario, Canada	61 (2.4) ▼
Buenos Aires, Argentina	61 (1.3) ▼
2 Abu Dhabi, UAE	41 (3.1) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.5.4: Intermediate International Benchmark – Example Item 4

Country	Percent Full Credit
† Hong Kong SAR	97 (0.6) ▲
Korea, Rep. of	95 (0.8) ▲
Chinese Taipei	94 (1.1) ▲
2 Singapore	92 (1.0) ▲
Finland	91 (1.2) ▲
Japan	91 (1.2) ▲
Norway (5)	89 (1.4) ▲
Poland	88 (1.4) ▲
2 Sweden	86 (1.8) ▲
‡ Northern Ireland	86 (1.8) ▲
Czech Republic	85 (1.5) ▲
† Belgium (Flemish)	84 (1.3) ▲
Germany	84 (1.8) ▲
Croatia	83 (1.9) ▲
† Netherlands	83 (1.8) ▲
Ireland	83 (1.6) ▲
England	83 (1.6) ▲
Russian Federation	81 (1.9) ▲
Slovenia	81 (1.9) ▲
2 Portugal	79 (2.0) ▲
2 Lithuania	79 (1.9) ▲
Hungary	78 (2.2) ▲
Australia	78 (2.1) ▲
1 2 † Canada	78 (1.5) ▲
2 † United States	77 (1.4) ▲
2 † Denmark	77 (1.9) ▲
2 Spain	76 (1.8) ▲
2 Italy	75 (1.9) ▲
3 Serbia	74 (2.2) ▲
Slovak Republic	74 (1.9) ▲
New Zealand	71 (1.6)
Cyprus	70 (1.7)
Bulgaria	69 (2.6)
International Avg.	68 (0.2)
Kazakhstan	62 (2.8) ▼
Chile	58 (2.6) ▼
Turkey	53 (1.7) ▼
1 Georgia	51 (3.0) ▼
United Arab Emirates	51 (1.1) ▼
Qatar	50 (1.9) ▼
2 Bahrain	48 (1.1) ▼
Iran, Islamic Rep. of	39 (1.7) ▼
Indonesia	34 (1.6) ▼
Oman	30 (1.6) ▼
South Africa (5)	27 (1.1) ▼
Jordan	24 (1.2) ▼
Morocco	22 (1.6) ▼
Kuwait	21 (1.5) ▼
Saudi Arabia	2 (0.4) ▼
France	- -

Content Domain: Data Display
Cognitive Domain: Applying
Description: Reads data from a table

The table below shows the sizes of large snakes.

Type of snake	Weight (kilograms)	Length (meters)
Boa Constrictor	27	4
Burmese Python	90	5 to 7
Green Anaconda	227	6 to 9
King Cobra	9	4

A. James saw a snake that was 8 meters long. Which type of snake could it be?

Answer: Green Anaconda

B. Naima saw a snake that was 6 meters long and weighed about 80 kilograms. Which type of snake could it be?

Answer: Burmese Python

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	89 (2.5) ▲
1 Florida, US	79 (2.4) ▲
Ontario, Canada	76 (1.7) ▲
Norway (4)	69 (2.2)
Dubai, UAE	69 (1.4)
Buenos Aires, Argentina	54 (1.8) ▼
2 Abu Dhabi, UAE	43 (2.2) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.6: Description of the TIMSS 2015 High International Benchmark (550) of Mathematics Achievement

550 High International Benchmark

Summary

Students can apply their knowledge and understanding to solve problems. They can solve word problems involving operations with whole numbers, simple fractions, and two-place decimals. Students demonstrate understanding of geometric properties of shapes and of angles that are less than or greater than a right angle. Students can interpret and use data in tables and a variety of graphs to solve problems.

Students at this level have a conceptual understanding of whole numbers which they can apply to solve word problems. They can multiply two-digit numbers and perform division with a remainder. They show some understanding of multiples and factors and can round numbers. Students can add and subtract two-place decimals. They can relate different representations of fractions in problem situations. Students can identify an expression that represents a situation and solve simple number sentences.

Students can classify and compare a variety of shapes based on properties. They can compare and draw angles that are less than or greater than a right angle. Students can locate positions and carry out movements on lines and grids. They demonstrate understanding of line symmetry.

Students can solve problems by interpreting data presented in tables, pie charts, pictographs, and bar graphs labeled with intervals greater than one. They can compare data from two representations to draw conclusions.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.6.1: High International Benchmark – Example Item 1

Country	Percent Correct
Korea, Rep. of	91 (1.2) ▲
† Hong Kong SAR	91 (1.6) ▲
Chinese Taipei	85 (1.7) ▲
2 Singapore	85 (1.3) ▲
Japan	84 (1.5) ▲
Finland	81 (1.8) ▲
2 Portugal	79 (1.6) ▲
2 Sweden	77 (2.4) ▲
Russian Federation	76 (2.1) ▲
Hungary	74 (2.8) ▲
2 † United States	74 (1.4) ▲
Germany	74 (2.1) ▲
Czech Republic	74 (1.9) ▲
Norway (5)	73 (2.1) ▲
2 Italy	73 (2.2) ▲
Croatia	72 (2.3) ▲
Cyprus	72 (1.7) ▲
England	71 (1.8) ▲
France	71 (2.3) ▲
Bulgaria	71 (2.3) ▲
Slovak Republic	71 (2.0) ▲
† Netherlands	70 (2.0) ▲
‡ Northern Ireland	70 (2.3) ▲
Poland	69 (2.2) ▲
† Belgium (Flemish)	68 (1.9)
1 2 † Canada	67 (1.6)
2 Spain	66 (1.9)
3 Serbia	65 (2.5)
International Avg.	64 (0.3)
2 † Denmark	64 (2.5)
Australia	63 (2.6)
Slovenia	62 (2.4)
Ireland	61 (2.2)
Kazakhstan	61 (2.3)
2 Lithuania	61 (2.5)
Chile	56 (1.7) ▼
Turkey	56 (1.6) ▼
2 Bahrain	55 (1.2) ▼
1 Georgia	52 (2.4) ▼
New Zealand	51 (2.1) ▼
Oman	51 (1.6) ▼
Iran, Islamic Rep. of	50 (1.5) ▼
United Arab Emirates	49 (1.2) ▼
Jordan	48 (1.4) ▼
Qatar	45 (2.3) ▼
Morocco	38 (1.2) ▼
Saudi Arabia	37 (2.9) ▼
Indonesia	34 (1.3) ▼
Kuwait	33 (1.5) ▼
South Africa (5)	27 (0.9) ▼

Content Domain: Number
Cognitive Domain: Reasoning
Description: Analyzes place value conditions to identify a four-digit number

Blair made this puzzle about a 4-digit number:

The hundreds digit is 7.

The thousands digit is greater than the hundreds digit.

The ones digit is less than the hundreds digit.

What is Blair's number?

Ⓐ 2708

Ⓑ 4733

● 8726

Ⓓ 9718

Country	Percent Correct
Benchmarking Participants	
‡ Quebec, Canada	82 (3.0) ▲
1 Florida, US	75 (2.5) ▲
Ontario, Canada	64 (1.9)
Dubai, UAE	62 (1.7)
Norway (4)	61 (2.6)
2 Abu Dhabi, UAE	43 (2.2) ▼
Buenos Aires, Argentina	40 (1.6) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.6.2: High International Benchmark – Example Item 2

Country	Percent Correct
[2] Singapore	79 (1.6) ▲
Korea, Rep. of	75 (1.8) ▲
† Hong Kong SAR	73 (1.7) ▲
Japan	70 (2.4) ▲
‡ Northern Ireland	70 (2.3) ▲
Ireland	65 (2.4) ▲
Poland	64 (2.5) ▲
England	62 (2.4) ▲
† Netherlands	62 (2.4) ▲
Germany	62 (2.1) ▲
[2] Lithuania	62 (2.6) ▲
Chinese Taipei	61 (2.0) ▲
Russian Federation	59 (2.2) ▲
[2] † Denmark	59 (2.2) ▲
† Belgium (Flemish)	59 (1.8) ▲
[2] Spain	59 (2.6) ▲
Kazakhstan	58 (3.0) ▲
Finland	58 (2.6) ▲
[2] † United States	58 (1.4) ▲
[2] Portugal	57 (2.2) ▲
Norway (5)	55 (2.6)
Slovenia	54 (2.0)
Bulgaria	54 (2.6)
Australia	53 (2.3)
Cyprus	52 (2.3)
International Avg.	51 (0.3)
Croatia	51 (2.2)
Czech Republic	51 (2.5)
Slovak Republic	50 (2.0)
[2] Sweden	49 (2.6)
[1] [2] † Canada	48 (1.9)
Hungary	48 (2.3)
Turkey	47 (2.0)
[2] Italy	47 (2.5)
New Zealand	47 (2.1)
[3] Serbia	47 (2.5)
France	42 (2.4) ▼
[1] Georgia	41 (2.6) ▼
[2] Bahrain	36 (2.2) ▼
United Arab Emirates	36 (1.1) ▼
Indonesia	33 (2.3) ▼
Qatar	30 (1.7) ▼
Chile	28 (1.7) ▼
Iran, Islamic Rep. of	28 (2.6) ▼
Oman	27 (1.4) ▼
Kuwait	27 (2.2) ▼
Saudi Arabia	26 (1.9) ▼
Morocco	22 (2.0) ▼
Jordan	- -
South Africa (5)	- -

Content Domain: Number
Cognitive Domain: Applying
Description: Solves a multi-step problem involving two-place decimals and whole numbers

A bottle of apple juice costs 1.87 zeds.

A bottle of orange juice costs 3.29 zeds.

Gavin has 4 zeds.

How much **more** does Gavin need to buy both bottles of juice?

Ⓐ 1.06 zeds
● 1.16 zeds
Ⓒ 5.06 zeds
Ⓓ 5.16 zeds

Country	Percent Correct
Benchmarking Participants	
[1] Florida, US	58 (2.7) ▲
Dubai, UAE	51 (1.9)
Ontario, Canada	49 (3.0)
‡ Quebec, Canada	47 (3.3)
Norway (4)	41 (2.4) ▼
[2] Abu Dhabi, UAE	34 (2.6) ▼
Buenos Aires, Argentina	25 (2.7) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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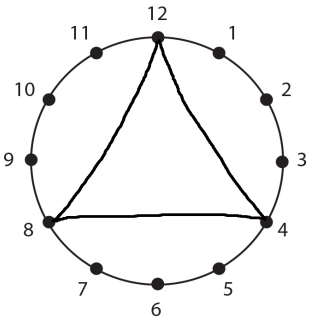
Exhibit 2.6.3: High International Benchmark – Example Item 3

Country	Percent Full Credit
Finland	76 (1.9) ▲
Korea, Rep. of	76 (2.1) ▲
Poland	75 (2.2) ▲
Japan	73 (1.7) ▲
2 † Denmark	73 (2.2) ▲
2 Lithuania	73 (3.0) ▲
† Belgium (Flemish)	72 (2.2) ▲
2 Sweden	71 (2.2) ▲
Slovenia	71 (2.0) ▲
‡ Northern Ireland	69 (2.8) ▲
Russian Federation	68 (2.2) ▲
Croatia	68 (2.3) ▲
Germany	67 (2.1) ▲
Hungary	66 (2.0) ▲
Czech Republic	66 (2.2) ▲
Cyprus	66 (2.1) ▲
1 2 † Canada	65 (1.4) ▲
England	65 (2.3) ▲
2 Singapore	64 (1.8) ▲
Norway (5)	64 (2.1) ▲
Australia	63 (2.2) ▲
† Netherlands	63 (2.5) ▲
Chinese Taipei	63 (2.3) ▲
2 Portugal	62 (2.3) ▲
Ireland	62 (2.2) ▲
2 Spain	62 (2.5)
France	62 (2.3)
New Zealand	60 (2.2)
† Hong Kong SAR	59 (2.6)
Slovak Republic	58 (2.3)
International Avg.	58 (0.3)
Kazakhstan	57 (2.8)
2 † United States	55 (1.4)
Bulgaria	55 (2.4)
Chile	54 (2.5)
3 Serbia	52 (2.6) ▼
1 Georgia	49 (2.4) ▼
2 Italy	46 (2.3) ▼
Qatar	46 (2.4) ▼
United Arab Emirates	43 (1.2) ▼
2 Bahrain	42 (2.0) ▼
Iran, Islamic Rep. of	38 (2.8) ▼
Oman	38 (1.6) ▼
Turkey	35 (1.9) ▼
Saudi Arabia	30 (2.0) ▼
Kuwait	24 (2.2) ▼
Indonesia	21 (2.0) ▼
Morocco	18 (2.1) ▼
Jordan	- -
South Africa (5)	- -

Content Domain: Geometric Shapes and Measures
Cognitive Domain: Reasoning
Description: Draws a specified geometric shape by connecting dots on a circle

In the circle, draw a triangle with all sides the same length.



What points did you connect? 12, 4, 8, 12

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	72 (2.5) ▲
Ontario, Canada	66 (2.1) ▲
Norway (4)	61 (2.4)
Dubai, UAE	55 (1.6)
1 Florida, US	53 (2.9)
Buenos Aires, Argentina	39 (2.5) ▼
2 Abu Dhabi, UAE	38 (2.5) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.6.4: High International Benchmark – Example Item 4

Country	Percent Full Credit
Korea, Rep. of	80 (1.6) ▲
Japan	73 (1.9) ▲
† Hong Kong SAR	71 (2.5) ▲
Norway (5)	70 (1.8) ▲
2 Singapore	67 (1.6) ▲
Chinese Taipei	67 (2.1) ▲
Russian Federation	66 (2.1) ▲
Australia	63 (2.3) ▲
Slovenia	62 (2.2) ▲
Poland	62 (2.5) ▲
‡ Northern Ireland	61 (2.7) ▲
† Netherlands	60 (2.8) ▲
1 2 † Canada	60 (2.1) ▲
England	58 (2.3) ▲
2 Portugal	58 (2.1) ▲
Turkey	57 (2.1) ▲
2 Sweden	56 (2.3) ▲
2 † Denmark	56 (2.7) ▲
2 Spain	56 (2.5) ▲
Cyprus	55 (2.2) ▲
Chile	54 (2.2)
2 Lithuania	54 (2.3)
Germany	53 (2.3)
Ireland	52 (2.7)
International Avg.	51 (0.3)
Hungary	50 (2.4)
2 Bahrain	48 (2.3)
Czech Republic	47 (2.2)
3 Serbia	47 (2.7)
Qatar	46 (2.1) ▼
United Arab Emirates	46 (1.4) ▼
2 Italy	44 (2.3) ▼
Oman	44 (1.7) ▼
2 † United States	44 (1.5) ▼
Slovak Republic	43 (2.2) ▼
Finland	42 (2.1) ▼
New Zealand	42 (2.3) ▼
France	42 (2.3) ▼
Bulgaria	39 (2.3) ▼
Kazakhstan	38 (2.0) ▼
Croatia	38 (2.3) ▼
Iran, Islamic Rep. of	36 (2.7) ▼
Indonesia	30 (2.1) ▼
Saudi Arabia	29 (1.8) ▼
1 Georgia	29 (2.5) ▼
Morocco	19 (1.9) ▼
Kuwait	15 (1.6) ▼
† Belgium (Flemish)	- -
Jordan	- -
South Africa (5)	- -

Content Domain: Data Display
Cognitive Domain: Applying
Description: Completes a bar graph from information given in a tally chart

Mr. Smith asked the students in his class about what they did after school.

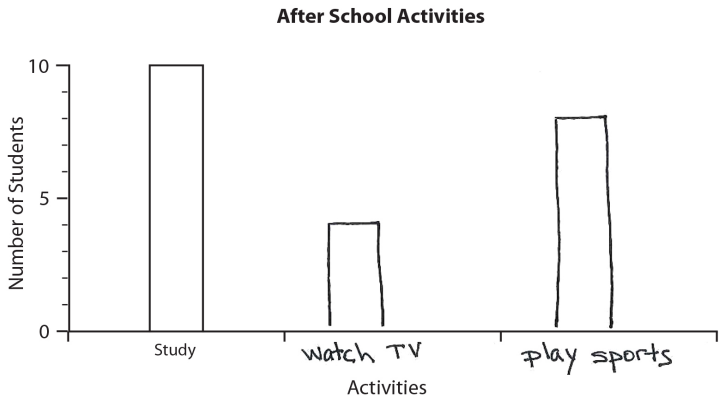
These are the results for 3 things they did.

After School Activities

Activities	Tally Marks
Play sports	///// ///
Watch TV	////
Study	///// /////

Mr. Smith started making a bar chart showing how many students did each activity.

Complete the graph by drawing and labeling the other two bars.



The answer shown illustrates the type of response that would receive full credit (2 points).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	69 (3.2) ▲
Dubai, UAE	58 (1.7) ▲
Ontario, Canada	56 (3.9)
Norway (4)	50 (2.5)
1 Florida, US	49 (3.0)
2 Abu Dhabi, UAE	43 (2.2) ▼
Buenos Aires, Argentina	14 (2.0) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.6.5: High International Benchmark – Example Item 5

Country	Percent Full Credit
Korea, Rep. of	77 (1.7) ▲
Japan	66 (1.9) ▲
Chinese Taipei	61 (2.1) ▲
[2] Singapore	59 (2.1) ▲
† Hong Kong SAR	59 (2.4) ▲
Kazakhstan	59 (2.8) ▲
Russian Federation	58 (2.1) ▲
Czech Republic	57 (2.3) ▲
‡ Northern Ireland	56 (2.5) ▲
† Netherlands	53 (2.1) ▲
Norway (5)	53 (2.5) ▲
Finland	51 (2.2) ▲
England	50 (2.0) ▲
Ireland	49 (2.7) ▲
Slovak Republic	49 (2.3) ▲
Slovenia	48 (2.4) ▲
[2] Lithuania	47 (2.4) ▲
Germany	47 (2.2) ▲
[2] Portugal	46 (2.2) ▲
† Belgium (Flemish)	46 (1.9) ▲
[3] Serbia	45 (2.3) ▲
[2] Sweden	44 (2.7)
Hungary	43 (2.0)
Australia	42 (2.6)
[2] Italy	42 (2.2)
[2] † United States	41 (1.5)
[2] † Denmark	40 (2.5)
Croatia	40 (2.2)
[1] [2] † Canada	40 (1.5)
International Avg.	**39 (0.3)**
[2] Spain	37 (2.1)
Cyprus	36 (2.5)
New Zealand	36 (1.7) ▼
France	34 (2.3) ▼
Bulgaria	33 (2.3) ▼
Poland	32 (2.0) ▼
Turkey	30 (1.8) ▼
United Arab Emirates	21 (1.0) ▼
[1] Georgia	20 (2.4) ▼
Chile	17 (1.6) ▼
Qatar	14 (1.6) ▼
[2] Bahrain	14 (1.3) ▼
Saudi Arabia	12 (1.7) ▼
Iran, Islamic Rep. of	10 (1.9) ▼
Morocco	9 (1.6) ▼
Oman	7 (0.8) ▼
Kuwait	7 (1.4) ▼
Indonesia	4 (1.0) ▼
Jordan	- -
South Africa (5)	- -

Content Domain: Data Display
Cognitive Domain: Applying
Description: Compares information in a table and a bar graph to solve a problem

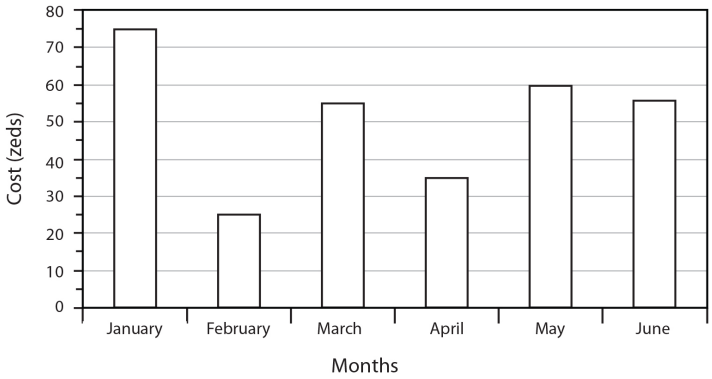
In 2008, Peter paid the following amounts in the first six months for his telephone bill.

Peter's Telephone Bill in 2008

Month	January	February	March	April	May	June
Cost (zeds)	65	20	60	40	60	45

In 2009, Peter paid the following amounts in the first six months for his telephone bill.

Peter's Telephone Bill in 2009



In some months, Peter paid **less** for his telephone bill in 2009 than in 2008.

In which months?

Answer: march and April

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	53 (3.5) ▲
[1] Florida, US	38 (3.0)
Ontario, Canada	38 (2.1)
Dubai, UAE	34 (1.7) ▼
Norway (4)	34 (2.1) ▼
Buenos Aires, Argentina	20 (2.5) ▼
[2] Abu Dhabi, UAE	16 (1.8) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.7: Description of the TIMSS 2015 Advanced International Benchmark (625) of Mathematics Achievement

625 Advanced International Benchmark

Summary

Students can apply their understanding and knowledge in a variety of relatively complex situations and explain their reasoning. They can solve a variety of multi-step word problems involving whole numbers. Students at this level show an increasing understanding of fractions and decimals. They can apply knowledge of a range of two- and three-dimensional shapes in a variety of situations. They can interpret and represent data to solve multi-step problems.

Students can solve a variety of multi-step word problems involving whole numbers. They can find more than one solution to a problem and solve number sentences with operations on both sides. Students can solve problems that show an increased understanding of fractions, including explanation of pictorial representations of fractions. They can solve problems involving both one- and two-place decimals.

Students can apply knowledge of a range of two- and three-dimensional shapes in a variety of situations. They can draw parallel and perpendicular lines to satisfy given conditions. Students can solve problems involving area and perimeter of simple shapes. They can read a ruler to find the length of an object beginning or ending at a half-unit.

Students can interpret and represent data to solve multi-step problems.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 2.7.1: Advanced International Benchmark – Example Item 1

Country	Percent Correct
Korea, Rep. of	77 (1.7) ▲
† Hong Kong SAR	71 (2.7) ▲
Japan	66 (1.9) ▲
2 Singapore	65 (2.1) ▲
Chinese Taipei	62 (1.9) ▲
2 † Denmark	55 (2.6) ▲
Russian Federation	54 (2.0) ▲
Kazakhstan	52 (2.3) ▲
2 Lithuania	52 (3.0) ▲
Poland	49 (2.4) ▲
Czech Republic	47 (2.4) ▲
2 Sweden	47 (2.6) ▲
† Netherlands	47 (2.4) ▲
Norway (5)	46 (2.0) ▲
2 † United States	43 (1.4) ▲
‡ Northern Ireland	43 (3.3)
Finland	42 (1.7) ▲
Bulgaria	41 (2.5)
Slovenia	39 (2.3)
Australia	39 (2.3)
Slovak Republic	38 (2.1)
England	38 (2.2)
2 Portugal	38 (2.3)
Hungary	37 (2.0)
International Avg.	37 (0.3)
† Belgium (Flemish)	37 (2.6)
1 2 † Canada	36 (1.7)
Ireland	36 (3.0)
Germany	35 (2.0)
2 Italy	34 (2.1)
3 Serbia	34 (2.6)
Croatia	31 (2.4) ▼
Cyprus	31 (2.3) ▼
New Zealand	31 (1.7) ▼
1 Georgia	30 (2.4) ▼
Turkey	29 (1.7) ▼
France	28 (2.3) ▼
United Arab Emirates	24 (1.1) ▼
Qatar	23 (1.9) ▼
2 Spain	23 (1.9) ▼
2 Bahrain	21 (0.9) ▼
Oman	21 (1.4) ▼
Indonesia	21 (1.1) ▼
Iran, Islamic Rep. of	21 (1.6) ▼
Chile	19 (1.7) ▼
Jordan	16 (1.3) ▼
Morocco	16 (1.2) ▼
Saudi Arabia	16 (1.9) ▼
South Africa (5)	13 (0.6) ▼
Kuwait	11 (0.8) ▼

Content Domain: Number
Cognitive Domain: Reasoning
Description: Solves a multi-step reasoning problem involving division

Sally has 12 lengths of wire, 40 round beads, and 48 flat beads.

She uses 1 length of wire, 10 round beads, and 8 flat beads to make 1 bracelet.

If Sally makes all her bracelets the same, how many bracelets can she make?

Ⓐ 40
Ⓑ 12
Ⓒ 5
● 4

Country	Percent Correct
Benchmarking Participants	
1 Florida, US	46 (3.9) ▲
Ontario, Canada	39 (2.5)
‡ Quebec, Canada	36 (3.4)
Dubai, UAE	35 (1.6)
Norway (4)	30 (1.9) ▼
Buenos Aires, Argentina	22 (1.3) ▼
2 Abu Dhabi, UAE	18 (1.8) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

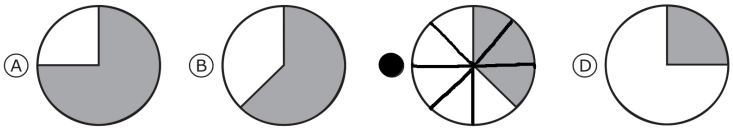
Downloaded from timss2015.org/download-center

Exhibit 2.7.2: Advanced International Benchmark – Example Item 2

Country	Percent Full Credit
Korea, Rep. of	67 (1.9) ▲
[2] Singapore	64 (1.6) ▲
† Hong Kong SAR	50 (2.8) ▲
Japan	49 (2.3) ▲
[2] † United States	46 (1.4) ▲
Chinese Taipei	43 (2.5) ▲
Poland	41 (2.8) ▲
[2] † Denmark	38 (2.4) ▲
Turkey	35 (2.1) ▲
Norway (5)	34 (2.3) ▲
[2] Portugal	34 (2.2) ▲
Russian Federation	33 (2.4) ▲
† Belgium (Flemish)	32 (2.2) ▲
Slovenia	32 (2.0) ▲
Czech Republic	30 (2.4) ▲
Kazakhstan	28 (2.3)
[1] [2] † Canada	28 (1.9)
Cyprus	27 (1.6)
England	26 (1.8)
[2] Lithuania	26 (2.1)
[2] Spain	24 (2.1)
International Avg.	24 (0.3)
‡ Northern Ireland	24 (2.4)
Australia	23 (1.5)
Chile	23 (1.9)
† Netherlands	22 (2.1)
Ireland	21 (1.6) ▼
[2] Sweden	21 (2.1)
New Zealand	21 (1.7) ▼
[3] Serbia	21 (2.3)
Hungary	19 (1.7) ▼
Oman	18 (1.3) ▼
[2] Bahrain	17 (2.2) ▼
Qatar	15 (1.6) ▼
United Arab Emirates	15 (0.9) ▼
France	15 (1.6) ▼
Finland	13 (1.6) ▼
Slovak Republic	13 (1.7) ▼
[2] Italy	11 (1.4) ▼
Iran, Islamic Rep. of	10 (1.5) ▼
Bulgaria	7 (1.4) ▼
Saudi Arabia	7 (1.1) ▼
Indonesia	6 (1.2) ▼
[1] Georgia	5 (1.2) ▼
Kuwait	4 (1.0) ▼
Morocco	4 (0.8) ▼
Croatia	4 (1.1) ▼
Germany	2 (0.7) ▼
Jordan	- -
South Africa (5)	- -

Content Domain: Number
Cognitive Domain: Reasoning
Description: Part B - Explains why a chosen circular representation shows a given non-unit fraction

A. Which of the circles below has $\frac{3}{8}$ of its area shaded?



B. Explain or show why your answer is correct.

There are 8 sections and 3 are shaded.

The answer shown for part B illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
[1] Florida, US	54 (3.6) ▲
‡ Quebec, Canada	34 (3.6) ▲
Ontario, Canada	28 (2.5)
Dubai, UAE	28 (1.6)
Norway (4)	16 (2.1) ▼
Buenos Aires, Argentina	10 (1.8) ▼
[2] Abu Dhabi, UAE	9 (1.5) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.7.3: Advanced International Benchmark – Example Item 3

Country	Percent Correct
Korea, Rep. of	70 (2.1) ▲
2 Singapore	68 (1.8) ▲
† Hong Kong SAR	63 (2.3) ▲
Russian Federation	53 (2.2) ▲
‡ Northern Ireland	52 (2.8) ▲
Kazakhstan	49 (2.8) ▲
Chinese Taipei	48 (2.3) ▲
Poland	45 (2.3) ▲
Bulgaria	45 (2.4) ▲
Japan	45 (2.1) ▲
Norway (5)	44 (2.9) ▲
Finland	44 (2.0) ▲
2 Sweden	41 (2.3)
2 † Denmark	41 (2.0)
England	40 (2.2)
Slovenia	39 (2.5)
2 † United States	39 (1.4)
Cyprus	39 (1.9)
† Belgium (Flemish)	38 (2.1)
International Avg.	37 (0.3)
Turkey	37 (1.8)
2 Spain	35 (2.3)
Hungary	35 (2.5)
† Netherlands	35 (2.1)
Ireland	35 (2.6)
3 Serbia	35 (2.3)
Czech Republic	34 (2.2)
2 Portugal	34 (2.0)
2 Lithuania	34 (2.8)
Slovak Republic	33 (2.2) ▼
2 Italy	33 (2.3)
Australia	33 (2.2) ▼
1 2 † Canada	33 (1.4) ▼
New Zealand	32 (1.9) ▼
United Arab Emirates	32 (1.2) ▼
1 Georgia	32 (2.4) ▼
Croatia	31 (2.2) ▼
2 Bahrain	30 (2.6) ▼
Germany	30 (1.9) ▼
Chile	30 (2.3) ▼
France	28 (2.0) ▼
Oman	28 (1.6) ▼
Saudi Arabia	25 (1.9) ▼
Qatar	25 (1.9) ▼
Iran, Islamic Rep. of	24 (2.2) ▼
Kuwait	24 (1.7) ▼
Morocco	22 (2.1) ▼
Indonesia	19 (2.0) ▼
Jordan	- -
South Africa (5)	- -

Content Domain: Geometric Shapes and Measures
Cognitive Domain: Applying
Description: Solves a multi-step word problem involving perimeter

The perimeter of a 5-sided figure is 30 centimeters. Three of the sides are each 4 cm long. The other two sides, A and B, are the same length.
What is the length of side A?

Ⓐ 6 cm
● 9 cm
Ⓒ 12 cm
Ⓓ 18 cm

Country	Percent Correct
Benchmarking Participants	
1 Florida, US	47 (2.1) ▲
Dubai, UAE	41 (1.9)
Ontario, Canada	37 (1.9)
Norway (4)	32 (2.6) ▼
‡ Quebec, Canada	30 (2.6) ▼
2 Abu Dhabi, UAE	25 (2.0) ▼
Buenos Aires, Argentina	15 (1.9) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.7.4: Advanced International Benchmark – Example Item 4

Country	Percent Full Credit
Korea, Rep. of	77 (1.7) ▲
Japan	68 (1.9) ▲
[2] Singapore	64 (1.8) ▲
Chinese Taipei	63 (2.1) ▲
† Hong Kong SAR	59 (2.4) ▲
Norway (5)	54 (2.3) ▲
Finland	54 (2.5) ▲
Poland	49 (2.8) ▲
Slovenia	48 (2.2) ▲
[1 2] † Canada	48 (1.9) ▲
Czech Republic	44 (2.0) ▲
Ireland	43 (2.8) ▲
[2] † United States	43 (1.6) ▲
[2] Sweden	42 (2.3) ▲
England	42 (2.3) ▲
Russian Federation	41 (2.3) ▲
Germany	39 (2.2) ▲
[3] Serbia	38 (1.9) ▲
Hungary	36 (2.1)
[2] Lithuania	36 (2.0)
‡ Northern Ireland	35 (2.2)
International Avg.	34 (0.3)
Australia	33 (2.2)
† Belgium (Flemish)	32 (2.1)
Cyprus	31 (1.7)
Kazakhstan	30 (2.6)
[2] Spain	29 (1.9) ▼
Slovak Republic	29 (1.6) ▼
† Netherlands	28 (2.3) ▼
New Zealand	28 (1.7) ▼
[2] Italy	28 (1.8) ▼
[2] Portugal	27 (1.7) ▼
Croatia	27 (2.0) ▼
Bulgaria	27 (2.4) ▼
[2] † Denmark	25 (2.1) ▼
France	25 (1.8) ▼
Turkey	24 (1.7) ▼
Oman	20 (1.3) ▼
United Arab Emirates	20 (1.0) ▼
[2] Bahrain	18 (1.8) ▼
Qatar	16 (1.8) ▼
[1] Georgia	16 (1.8) ▼
Chile	15 (1.3) ▼
Saudi Arabia	14 (1.3) ▼
Indonesia	14 (1.6) ▼
Iran, Islamic Rep. of	10 (1.6) ▼
Morocco	9 (1.3) ▼
Kuwait	2 (0.8) ▼
Jordan	- -
South Africa (5)	- -

Content Domain: Data Display
Cognitive Domain: Reasoning
Description: Part B - Draws and justifies a conclusion from data given in a table

In a triathlon race, athletes first swim, then cycle, and then run. The table below shows the race results for Kathy, Barbara, and Sue. One total has been filled in for you.

Triathlon Results in Minutes

	Kathy	Barbara	Sue
Swimming	35	25	50
Cycling	80	90	85
Running	135	130	120
Total:	250		

A. The person who finishes in the smallest number of minutes wins. Who won the triathlon? How long did she take?

Answer: Barbara 245 minutes

B. Sue wants to finish the triathlon race faster next year. What does she need to improve in most so that she can beat Kathy and Barbara?

(Check one box.)

- [x] Swimming
- [ ] Cycling
- [ ] Running

Sue should improve on swimming because she is 15 minutes behind Kathy and 25 minutes behind Barbara.

The answer shown for part B illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	55 (3.8) ▲
Ontario, Canada	48 (2.2) ▲
[1] Florida, US	40 (4.1)
Dubai, UAE	36 (1.9)
Norway (4)	32 (2.3)
[2] Abu Dhabi, UAE	14 (1.4) ▼
Buenos Aires, Argentina	13 (2.1) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.8: Descriptions of the TIMSS 2015 International Benchmarks of Mathematics Achievement

625 Advanced International Benchmark

Students can apply and reason in a variety of problem situations, solve linear equations, and make generalizations. They can solve a variety of fraction, proportion, and percent problems and justify their conclusions. Students can use their knowledge of geometric figures to solve a wide range of problems about area. They demonstrate understanding of the meaning of averages and can solve problems involving expected values.

550 High International Benchmark

Students can apply their understanding and knowledge in a variety of relatively complex situations. They can use information to solve problems involving different types of numbers and operations. They can relate fractions, decimals, and percentages to each other. Students at this level show basic procedural knowledge related to algebraic expressions. They can solve a variety of problems with angles including those involving triangles, parallel lines, rectangles, and similar figures. Students can interpret data in a variety of graphs and solve simple problems involving outcomes and probabilities.

475 Intermediate International Benchmark

Students can apply basic mathematical knowledge in a variety of situations. They can solve problems involving negative numbers, decimals, percentages, and proportions. Students have some knowledge of linear expressions and two- and three-dimensional shapes. They can read and interpret data in graphs and tables. They have some basic knowledge of chance.

400 Low International Benchmark

Students have some knowledge of whole numbers and basic graphs.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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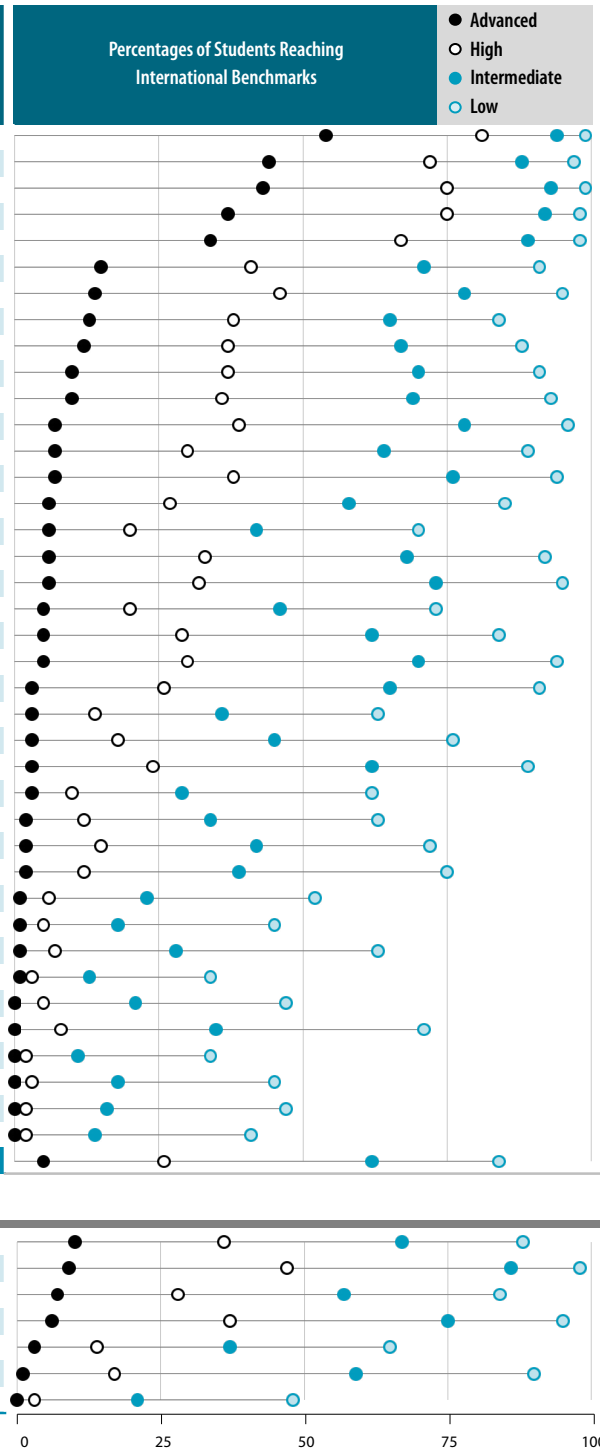
Exhibit 2.9: Performance at the International Benchmarks of Mathematics Achievement



Country	Advanced Benchmark (625)	High Benchmark (550)	Intermediate Benchmark (475)	Low Benchmark (400)
[2] Singapore	54 (1.8)	81 (1.5)	94 (0.9)	99 (0.2)
Chinese Taipei	44 (1.2)	72 (0.9)	88 (0.6)	97 (0.4)
Korea, Rep. of	43 (1.4)	75 (1.0)	93 (0.5)	99 (0.2)
Hong Kong SAR	37 (2.3)	75 (1.9)	92 (1.3)	98 (0.6)
Japan	34 (1.2)	67 (1.0)	89 (0.7)	98 (0.3)
Kazakhstan	15 (1.7)	41 (2.6)	71 (2.1)	91 (1.1)
Russian Federation	14 (1.4)	46 (2.5)	78 (1.9)	95 (0.8)
[3] Israel	13 (1.0)	38 (1.8)	65 (1.7)	84 (1.2)
Hungary	12 (1.2)	37 (1.7)	67 (1.7)	88 (1.1)
† United States	10 (0.9)	37 (1.5)	70 (1.4)	91 (0.7)
England	10 (1.1)	36 (2.4)	69 (2.4)	93 (1.2)
[1] † Canada	7 (0.6)	39 (1.4)	78 (1.1)	96 (0.5)
Australia	7 (0.8)	30 (1.4)	64 (1.6)	89 (1.0)
Ireland	7 (0.8)	38 (1.7)	76 (1.3)	94 (0.8)
† New Zealand	6 (0.8)	27 (1.2)	58 (1.5)	85 (1.2)
Turkey	6 (0.9)	20 (1.6)	42 (1.9)	70 (1.6)
[2] Lithuania	6 (0.8)	33 (1.4)	68 (1.4)	92 (0.8)
Slovenia	6 (0.6)	32 (1.3)	73 (1.2)	95 (0.6)
United Arab Emirates	5 (0.4)	20 (0.8)	46 (1.0)	73 (0.7)
Malta	5 (0.4)	29 (0.7)	62 (0.7)	84 (0.5)
Norway (9)	5 (0.5)	30 (1.2)	70 (1.3)	94 (0.5)
Sweden	3 (0.6)	26 (1.5)	65 (1.6)	91 (1.1)
ψ Qatar	3 (0.5)	14 (0.9)	36 (1.2)	63 (1.4)
Malaysia	3 (0.4)	18 (1.0)	45 (1.9)	76 (1.9)
[2] Italy	3 (0.5)	24 (1.3)	62 (1.7)	89 (1.0)
Thailand	3 (0.7)	10 (1.5)	29 (2.2)	62 (2.2)
ψ Iran, Islamic Rep. of	2 (0.7)	12 (1.4)	34 (1.9)	63 (1.9)
[1] [2] Georgia	2 (0.4)	15 (1.2)	42 (1.7)	72 (1.6)
Bahrain	2 (0.3)	12 (0.6)	39 (0.8)	75 (0.9)
ψ Oman	1 (0.1)	6 (0.5)	23 (0.9)	52 (1.2)
ψ Kuwait	1 (0.3)	5 (1.2)	18 (1.9)	45 (1.9)
ψ Chile	1 (0.2)	7 (0.8)	28 (1.3)	63 (2.0)
ж South Africa (9)	1 (0.2)	3 (0.8)	13 (1.7)	34 (2.3)
ψ Egypt	0 (0.1)	5 (0.6)	21 (1.4)	47 (1.8)
Lebanon	0 (0.2)	8 (0.8)	35 (1.9)	71 (2.0)
ж Saudi Arabia	0 (0.2)	2 (0.7)	11 (1.3)	34 (1.8)
ж Jordan	0 (0.1)	3 (0.4)	18 (1.0)	45 (1.5)
ψ Botswana (9)	0 (0.0)	2 (0.2)	16 (0.8)	47 (1.1)
ж Morocco	0 (0.0)	2 (0.3)	14 (0.7)	41 (1.1)
International Median	5	26	62	84
Benchmarking Participants				
Dubai, UAE	10 (0.8)	36 (1.2)	67 (1.0)	88 (0.5)
‡ Quebec, Canada	9 (1.1)	47 (2.5)	86 (2.2)	98 (0.7)
[1] Florida, US	7 (1.4)	28 (2.7)	57 (3.4)	84 (2.2)
Ontario, Canada	6 (0.7)	37 (1.7)	75 (1.4)	95 (0.6)
Abu Dhabi, UAE	3 (0.7)	14 (1.5)	37 (2.0)	65 (1.9)
Norway (8)	1 (0.2)	17 (1.0)	59 (1.3)	90 (0.9)
† ж Buenos Aires, Argentina	0 (0.1)	3 (0.7)	21 (1.6)	48 (2.1)

ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.10: Percentages of Students Reaching the International Benchmarks of Mathematics Achievement Across Assessment Years

Country	Advanced International Benchmark (625) Percent of Students						High International Benchmark (550) Percent of Students					
	2015	2011	2007	2003	1999	1995	2015	2011	2007	2003	1999	1995
Singapore	54	48 ▲	40 ▲	44 ▲	42 ▲	40 ▲	81	78	70 ▲	77	77	84
Chinese Taipei	44	49 ▼	45	38 ▲	37 ▲		72	73	71	66 ▲	67 ▲	
Korea, Rep. of	43	47	40	35 ▲	32 ▲	31 ▲	75	77	71 ▲	70 ▲	70 ▲	67 ▲
Hong Kong SAR	37	34	31 ▲	31 ▲	28 ▲	23 ▲	75	71	64 ▲	73	70	65 ▲
Japan	34	27 ▲	26 ▲	24 ▲	29 ▲	29 ▲	67	61 ▲	61 ▲	62 ▲	66	67
Kazakhstan	15	3 ▲					41	23 ▲				
Russian Federation	14	14	8 ▲	6 ▲	12	9 ▲	46	47	33 ▲	30 ▲	39 ▲	38 ▲
Israel	13	12					38	40				
Hungary	12	8 ▲	10	11	13	10	37	32 ▲	36	41	43 ▼	40
United States	10	7 ▲	6 ▲	7 ▲	7	4 ▲	37	30 ▲	31 ▲	29 ▲	30 ▲	26 ▲
England	10	8	8	5 ▲	6 ▲	6 ▲	36	32	35	26 ▲	25 ▲	27 ▲
Australia	7	9	6	7		7	30	29	24 ▲	29		33
Ireland	7					8	38					37
Lithuania	6	5	6	5	3 ▲	2 ▲	34	29 ▲	30 ▲	28 ▲	18 ▲	17 ▲
New Zealand	6	5		5	6	6	27	24		24	26	28
Turkey	6	7					20	20				
Slovenia	6	4 ▲	4	3 ▲		4 ▲	32	27 ▲	25 ▲	21 ▲		22 ▲
United Arab Emirates	5	2 ▲					20	14 ▲				
Malta	5		5				29		26 ▲			
Sweden	3	1 ▲	2	3		12 ▼	26	16 ▲	20 ▲	24		46 ▼
ψ Qatar	3	2					14	10 ▲				
Malaysia	3	2 ▲	2	6 ▼	10 ▼		18	12 ▲	18	30 ▼	36 ▼	
Italy	3	3	3	3	4		24	24	17 ▲	19 ▲	21	
Thailand	3	2	3		3		10	8	12		17 ▼	
ψ Iran, Islamic Rep. of	2	2	1 ▲	0 ▲	1 ▲	0 ▲	12	8 ▲	5 ▲	3 ▲	6 ▲	4 ▲
Georgia	2	3	1 ▲				15	13	7 ▲			
Bahrain	2	1	0 ▲	0 ▲			12	8 ▲	3 ▲	2 ▲		
Norway (8)	1	1	0 ▲	0		4 ▼	17	12 ▲	11 ▲	10 ▲		26 ▼
ψ Oman	1	0	0 ▲				6	4 ▲	2 ▲			
ψ Chile	1	1		0	1		7	5		3 ▲	4 ▲	
ж South Africa (9)	1	1					3	3				
ψ Egypt	0		1	1			5		5	6		
Lebanon	0	1	1	0			8	9	10	4 ▲		
ж Saudi Arabia	0	1					2	5 ▼				
ж Jordan	0	0	1 ▼	1 ▼	3 ▼		3	6 ▼	11 ▼	8 ▼	12 ▼	
ψ Kuwait	0		0				1		0 ▲			
ψ Botswana (9)	0	0					2	2				
ж Morocco	0	0					2	2				
Benchmarking Participants												
Dubai, UAE	10	5 ▲	3 ▲				36	23 ▲	17 ▲			
Quebec, Canada	9	6 ▲	8	8	18 ▼	14	47	40 ▲	37 ▲	45	60 ▼	54
Florida, US	7	8					28	31				
Ontario, Canada	6	4 ▲	6	6	6	3 ▲	37	31 ▲	33	34	32	26 ▲
Abu Dhabi, UAE	3	2					14	12				

▲ 2015 percent significantly higher

▼ 2015 percent significantly lower

An empty cell indicates a country did not participate in that year's assessment.

Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish and Russian. South Africa (9) tested one year later.

ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.10: Percentages of Students Reaching the International Benchmarks of Mathematics Achievement Across Assessment Years (Continued)

Country	Intermediate International Benchmark (475)						Low International Benchmark (400)					
	Percent of Students						Percent of Students					
	2015	2011	2007	2003	1999	1995	2015	2011	2007	2003	1999	1995
Singapore	94	92	88 ▲	93	94	98 ▼	99	99	97 ▲	99	99	100 ▼
Chinese Taipei	88	88	86	85 ▲	85 ▲		97	96	95	96	95 ▲	
Korea, Rep. of	93	93	90 ▲	90 ▲	91	89 ▲	99	99	98 ▲	98 ▲	99	97 ▲
Hong Kong SAR	92	89	85 ▲	93	92	88	98	97	94 ▲	98	98	96
Japan	89	87 ▲	87 ▲	88	90	91	98	97	97	98	98	98
Kazakhstan	71	57 ▲					91	85 ▲				
Russian Federation	78	78	68 ▲	66 ▲	73	73	95	95	91 ▲	92 ▲	93	93
Israel	65	68					84	87				
Hungary	67	65	69	75 ▼	75 ▼	74 ▼	88	88	91	95 ▼	93 ▼	94 ▼
United States	70	68	67	64 ▲	62 ▲	61 ▲	91	92	92	90	87 ▲	86 ▲
England	69	65	69	61 ▲	60 ▲	61 ▲	93	88 ▲	90	90	88 ▲	87 ▲
Australia	64	63	61	65		68	89	89	89	90		90
Ireland	76					73	94					91
Lithuania	69	64 ▲	65	63 ▲	53 ▲	50 ▲	92	90	90	90	85 ▲	81 ▲
New Zealand	58	57		59	57	64 ▼	85	84		88	84	89 ▼
Turkey	42	40					70	67				
Slovenia	73	67 ▲	65 ▲	60 ▲		60 ▲	95	93 ▲	92 ▲	90 ▲		90 ▲
United Arab Emirates	46	42 ▲					73	73				
Malta	62		60				84		83 ▲			
Sweden	65	57 ▲	60 ▲	64		81 ▼	91	89 ▲	90	91		96 ▼
ψ Qatar	36	29 ▲					63	54 ▲				
Malaysia	45	36 ▲	50	66 ▼	70 ▼		76	65 ▲	82 ▼	93 ▼	93 ▼	
Italy	62	64	54 ▲	56 ▲	53 ▲		89	90	85 ▲	86 ▲	82 ▲	
Thailand	29	28	34		45 ▼		62	62	66		79 ▼	
ψ Iran, Islamic Rep. of	34	26 ▲	20 ▲	20 ▲	26 ▲	24 ▲	63	55 ▲	51 ▲	55 ▲	61	59
Georgia	42	36 ▲	26 ▲				72	62 ▲	56 ▲			
Bahrain	39	26 ▲	19 ▲	17 ▲			75	53 ▲	49 ▲	51 ▲		
Norway (8)	59	51 ▲	48 ▲	44 ▲		64 ▼	90	87 ▲	85 ▲	81 ▲		90
ψ Oman	23	16 ▲	14 ▲				52	39 ▲	41 ▲			
ψ Chile	28	23 ▲		15 ▲	16 ▲		63	57 ▲		41 ▲	46 ▲	
ж South Africa (9)	13	9 ▲					34	24 ▲				
ψ Egypt	21		21	24			47		47	52 ▼		
Lebanon	35	38	36	27 ▲			71	73	74	68		
ж Saudi Arabia	11	20 ▼					34	47 ▼				
ж Jordan	18	26 ▼	35 ▼	30 ▼	33 ▼		45	55 ▼	61 ▼	60 ▼	61 ▼	
ψ Kuwait	11		6 ▲				37		29 ▲			
ψ Botswana (9)	16	15					47	50				
ж Morocco	14	12 ▲					41	36 ▲				
Benchmarking Participants												
Dubai, UAE	67	53 ▲	47 ▲				88	79 ▲	74 ▲			
Quebec, Canada	86	82	78 ▲	88	93 ▼	90	98	98	97	99	99	99
Florida, US	57	68 ▼					84	94 ▼				
Ontario, Canada	75	71 ▲	74	75	72	65 ▲	95	94	95	97 ▼	96	91 ▲
Abu Dhabi, UAE	37	39					65	71 ▼				

▲ 2015 percent significantly higher

▼ 2015 percent significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.11: Description of the TIMSS 2015 Low International Benchmark (400) of Mathematics Achievement

400 Low International Benchmark

Summary

Students have some knowledge of whole numbers and basic graphs.

The few items at this level provide some evidence that students have an elementary understanding of whole numbers. They can match tables to bar graphs and pictographs.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.11.1: Low International Benchmark – Example Item 1

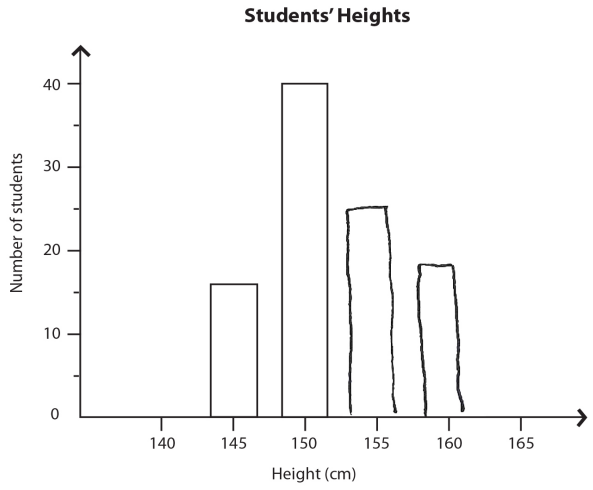
Country	Percent Full Credit
Hong Kong SAR	85 (1.4) ▲
[2] Singapore	83 (1.2) ▲
Slovenia	81 (1.7) ▲
[2] Lithuania	81 (2.1) ▲
Japan	79 (1.9) ▲
Malta	76 (1.9) ▲
Chinese Taipei	76 (1.8) ▲
Australia	74 (1.4) ▲
Korea, Rep. of	71 (2.2) ▲
Hungary	70 (2.0) ▲
Russian Federation	70 (2.6) ▲
Norway (9)	69 (2.3) ▲
Lebanon	69 (2.2) ▲
Bahrain	67 (1.9)
United Arab Emirates	67 (1.1) ▲
† United States	64 (1.4)
Kazakhstan	64 (2.1)
[3] Israel	64 (1.8)
Thailand	64 (2.1)
International Avg.	64 (0.3)
Malaysia	63 (2.0)
Turkey	62 (1.9)
Qatar	62 (1.9)
Morocco	61 (1.2)
Oman	61 (2.2)
[2] Italy	60 (2.3)
[1] † Canada	59 (1.5) ▼
Kuwait	59 (2.8)
England	58 (2.1) ▼
Sweden	57 (2.6) ▼
Chile	56 (2.2) ▼
Iran, Islamic Rep. of	56 (1.4) ▼
Egypt	53 (1.9) ▼
Ireland	53 (2.2) ▼
South Africa (9)	52 (1.7) ▼
[1] [2] Georgia	52 (2.6) ▼
† New Zealand	51 (1.8) ▼
Saudi Arabia	49 (2.5) ▼
Botswana (9)	44 (2.2) ▼
Jordan	42 (1.9) ▼

Content Domain: Data and Chance
Cognitive Domain: Applying
Description: Uses information in a table to complete a bar graph

The heights of 100 students in a school were measured to the nearest 5 cm. This table shows the results.

Height (cm)	145	150	155	160
Number	16	40	25	19

Complete this bar chart to show the same information.



The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
Dubai, UAE	75 (1.3) ▲
Norway (8)	71 (1.8) ▲
[1] Florida, US	62 (3.4)
Abu Dhabi, UAE	60 (2.4)
Ontario, Canada	59 (1.7) ▼
‡ Quebec, Canada	56 (2.1) ▼
† Buenos Aires, Argentina	36 (2.9) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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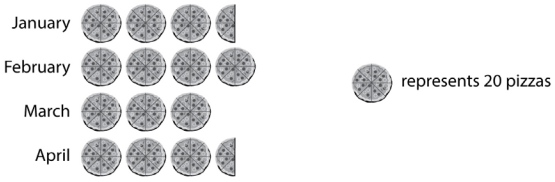
Exhibit 2.11.2: Low International Benchmark – Example Item 2

Country	Percent Correct
[2] Singapore	96 (0.6) ▲
Hong Kong SAR	95 (0.9) ▲
Korea, Rep. of	95 (0.9) ▲
Chinese Taipei	95 (0.9) ▲
Japan	93 (1.1) ▲
England	92 (1.2) ▲
Slovenia	90 (1.4) ▲
Ireland	90 (1.2) ▲
[2] Lithuania	89 (1.5) ▲
Australia	87 (1.3) ▲
Hungary	86 (1.7) ▲
[1] † Canada	86 (1.3) ▲
† New Zealand	85 (1.4) ▲
[2] Italy	85 (1.7) ▲
† United States	84 (1.0) ▲
Norway (9)	84 (1.8) ▲
Russian Federation	84 (1.8) ▲
Malta	83 (1.5) ▲
[1 2] Georgia	81 (2.1)
Thailand	81 (1.9)
United Arab Emirates	79 (0.9)
[3] Israel	78 (1.5)
International Avg.	78 (0.3)
Sweden	78 (1.8)
Bahrain	75 (1.9)
Malaysia	75 (1.6)
Turkey	75 (2.4)
Kazakhstan	73 (2.0) ▼
Iran, Islamic Rep. of	70 (1.8) ▼
Chile	70 (1.9) ▼
Qatar	69 (1.8) ▼
Kuwait	66 (2.1) ▼
Lebanon	64 (2.6) ▼
Oman	61 (1.5) ▼
Morocco	60 (1.5) ▼
Botswana (9)	59 (1.6) ▼
Jordan	58 (1.9) ▼
South Africa (9)	57 (1.7) ▼
Saudi Arabia	56 (2.6) ▼
Egypt	55 (1.9) ▼

Content Domain: Data and Chance
Cognitive Domain: Knowing
Description: Identifies the table that matches the information shown in a pictograph

The pictogram shows how many pizzas a shop sold in four months.



One of these tables shows the same information, which one?

Ⓐ

Month	Pizzas Sold
January	60
February	80
March	60
April	60

●

Month	Pizzas Sold
January	70
February	80
March	60
April	70

Ⓒ

Month	Pizzas Sold
January	70
February	140
March	60
April	70

Ⓓ

Month	Pizzas Sold
January	60
February	80
March	70
April	60

Country	Percent Correct
Benchmarking Participants	
‡ Quebec, Canada	90 (2.1) ▲
Dubai, UAE	87 (1.3) ▲
Ontario, Canada	84 (1.9) ▲
[1] Florida, US	82 (2.0) ▲
Norway (8)	80 (1.8)
Abu Dhabi, UAE	74 (1.9) ▼
† Buenos Aires, Argentina	56 (2.6) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.11.3: Low International Benchmark – Example Item 3

Country	Percent Correct
Korea, Rep. of	95 (0.8) ▲
Slovenia	93 (1.2) ▲
[2] Singapore	90 (1.1) ▲
Hong Kong SAR	89 (1.3) ▲
[2] Italy	87 (1.6) ▲
† United States	87 (1.0) ▲
Chinese Taipei	86 (1.3) ▲
Japan	86 (1.3) ▲
Russian Federation	84 (2.2) ▲
Lebanon	81 (1.9) ▲
Kazakhstan	80 (2.0) ▲
Ireland	79 (2.0) ▲
Hungary	77 (2.3) ▲
[1] † Canada	76 (1.4) ▲
Malaysia	75 (1.8) ▲
[2] Lithuania	75 (2.3) ▲
Chile	75 (2.2) ▲
Egypt	73 (1.9)
United Arab Emirates	72 (1.4)
International Avg.	70 (0.3)
[3] Israel	70 (1.9)
Bahrain	70 (1.8)
Malta	69 (1.8)
England	69 (2.5)
Turkey	69 (2.1)
Iran, Islamic Rep. of	68 (2.1)
Australia	66 (1.8) ▼
[1] [2] Georgia	64 (2.9) ▼
Qatar	63 (2.3) ▼
South Africa (9)	62 (2.1) ▼
Oman	60 (1.7) ▼
Thailand	59 (2.5) ▼
Jordan	57 (2.2) ▼
† New Zealand	57 (1.9) ▼
Norway (9)	57 (2.2) ▼
Kuwait	52 (2.7) ▼
Sweden	50 (2.4) ▼
Saudi Arabia	47 (2.4) ▼
Botswana (9)	39 (2.0) ▼
Morocco	35 (1.6) ▼

Content Domain: Number
Cognitive Domain: Knowing
Description: Evaluates the power of a whole number

What is the value of 3^3?

Ⓐ 6
Ⓑ 9
● 27
Ⓓ 33

Country	Percent Correct
Benchmarking Participants	
‡ Quebec, Canada	88 (2.2) ▲
[1] Florida, US	87 (2.9) ▲
Dubai, UAE	85 (1.5) ▲
† Buenos Aires, Argentina	75 (2.7)
Ontario, Canada	73 (1.9)
Abu Dhabi, UAE	64 (2.5) ▼
Norway (8)	33 (2.8) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.12: Description of the TIMSS 2015 Intermediate International Benchmark (475) of Mathematics Achievement

475 Intermediate International Benchmark

Summary

Students can apply basic mathematical knowledge in a variety of situations. They can solve problems involving negative numbers, decimals, percentages, and proportions. Students have some knowledge of linear expressions and two- and three-dimensional shapes. They can read and interpret data in graphs and tables. They have some basic knowledge of chance.

Students can solve problems involving negative numbers, decimals, percentages, and proportions. For example, they can calculate unit prices to solve a problem.

Students at this level can evaluate and solve simple linear equations.

Students have some basic knowledge about two- and three-dimensional shapes.

Students can locate and interpret data presented in tables, bar graphs, pie charts, and compare data from two line graphs to solve a problem. They have some basic knowledge of chance.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.12.1: Intermediate International Benchmark – Example Item 1

Country	Percent Full Credit
Chinese Taipei	85 (1.4) ▲
Hong Kong SAR	85 (1.7) ▲
[2] Singapore	82 (1.5) ▲
Russian Federation	77 (2.2) ▲
Slovenia	76 (1.9) ▲
Korea, Rep. of	75 (2.0) ▲
Japan	73 (1.7) ▲
Hungary	72 (2.2) ▲
Kazakhstan	70 (2.3) ▲
[1] † Canada	68 (1.7) ▲
[2] Italy	65 (2.2) ▲
† United States	64 (1.7) ▲
[3] Israel	63 (1.8) ▲
Ireland	63 (1.9) ▲
[2] Lithuania	62 (2.3) ▲
Sweden	59 (2.9)
Lebanon	56 (2.2)
[1] [2] Georgia	56 (2.7)
International Avg.	55 (0.3)
Australia	55 (2.0)
United Arab Emirates	54 (1.1)
Norway (9)	54 (2.4)
Malta	53 (2.0)
England	50 (2.7)
Qatar	49 (2.0) ▼
† New Zealand	48 (2.0) ▼
Malaysia	44 (1.9) ▼
Iran, Islamic Rep. of	42 (2.2) ▼
Morocco	42 (1.5) ▼
Turkey	41 (2.4) ▼
Bahrain	41 (1.8) ▼
Oman	40 (1.6) ▼
Egypt	40 (2.0) ▼
Thailand	39 (2.6) ▼
Kuwait	39 (2.1) ▼
Chile	38 (2.4) ▼
Jordan	34 (1.9) ▼
Saudi Arabia	30 (2.6) ▼
Botswana (9)	29 (1.7) ▼
South Africa (9)	23 (1.9) ▼

Content Domain: Number
Cognitive Domain: Knowing
Description: Recognizes the commutative property

For every whole number n, are these statements **true** or **false**?

Fill in one circle for each statement.

	True	False
$n + 4 = 4 + n$	●	Ⓑ
$n - 5 = 5 - n$	Ⓐ	●
$n \times 6 = 6 \times n$	●	Ⓑ
$n \div 7 = 7 \div n$	Ⓐ	●

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	74 (2.4) ▲
Dubai, UAE	69 (1.6) ▲
Ontario, Canada	65 (2.1) ▲
[1] Florida, US	59 (2.9)
Abu Dhabi, UAE	46 (2.2) ▼
† Buenos Aires, Argentina	42 (2.6) ▼
Norway (8)	40 (2.2) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.12.2: Intermediate International Benchmark – Example Item 2

Country	Percent Correct
[2] Singapore	95 (0.8) ▲
Hong Kong SAR	91 (1.5) ▲
Korea, Rep. of	88 (1.5) ▲
Ireland	86 (1.8) ▲
† United States	85 (1.3) ▲
Chinese Taipei	80 (1.4) ▲
[1] † Canada	80 (1.7) ▲
England	76 (2.0) ▲
Lebanon	75 (2.7) ▲
Japan	75 (1.8) ▲
Kazakhstan	75 (2.2) ▲
Russian Federation	75 (2.4) ▲
Malta	74 (1.6) ▲
Norway (9)	71 (2.2) ▲
Australia	71 (1.6) ▲
Sweden	69 (2.8) ▲
Slovenia	66 (2.2) ▲
† New Zealand	66 (1.9) ▲
[2] Lithuania	66 (2.4)
United Arab Emirates	65 (1.5) ▲
[3] Israel	65 (2.0)
Malaysia	63 (2.1)
International Avg.	62 (0.3)
[2] Italy	59 (2.5)
Qatar	59 (2.1)
Hungary	57 (2.4) ▼
Bahrain	52 (2.3) ▼
Egypt	52 (2.2) ▼
Morocco	52 (1.6) ▼
Botswana (9)	51 (2.0) ▼
Kuwait	44 (2.6) ▼
Oman	41 (1.5) ▼
[1] [2] Georgia	41 (2.9) ▼
Turkey	39 (2.1) ▼
South Africa (9)	37 (2.0) ▼
Chile	36 (2.3) ▼
Thailand	36 (2.8) ▼
Iran, Islamic Rep. of	35 (2.1) ▼
Saudi Arabia	35 (2.6) ▼
Jordan	29 (1.8) ▼

Content Domain: Number
Cognitive Domain: Knowing
Description: Identifies the decimal number closest in size to a given fraction

Which number is closest in size to $\frac{3}{4}$?

Ⓐ 0.34
Ⓑ 0.43
● 0.74
Ⓓ 0.79

Country	Percent Correct
Benchmarking Participants	
‡ Quebec, Canada	87 (2.2) ▲
[1] Florida, US	85 (2.8) ▲
Ontario, Canada	77 (2.2) ▲
Dubai, UAE	72 (2.6) ▲
Abu Dhabi, UAE	62 (2.6)
Norway (8)	60 (2.2)
† Buenos Aires, Argentina	35 (2.4) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.12.3: Intermediate International Benchmark – Example Item 3

Country	Percent Full Credit
[2] Singapore	86 (1.4) ▲
Korea, Rep. of	84 (1.4) ▲
Hong Kong SAR	84 (1.9) ▲
Japan	81 (1.5) ▲
Chinese Taipei	73 (1.7) ▲
Slovenia	73 (2.1) ▲
Norway (9)	72 (2.1) ▲
[1] † Canada	71 (1.6) ▲
[2] Lithuania	71 (2.0) ▲
England	70 (2.2) ▲
Sweden	70 (2.1) ▲
Russian Federation	70 (2.3) ▲
Ireland	70 (1.9) ▲
Hungary	68 (2.5) ▲
[3] Israel	66 (1.8) ▲
Kazakhstan	63 (2.7) ▲
† New Zealand	62 (1.9) ▲
Australia	62 (1.9) ▲
† United States	58 (1.6) ▲
[2] Italy	57 (2.5)
International Avg.	53 (0.3)
Malta	53 (2.1)
[1] [2] Georgia	49 (2.6)
Lebanon	48 (2.7) ▼
United Arab Emirates	43 (1.4) ▼
Morocco	42 (1.5) ▼
Turkey	41 (2.0) ▼
Iran, Islamic Rep. of	39 (2.2) ▼
Chile	38 (2.3) ▼
Qatar	37 (2.5) ▼
Egypt	34 (2.1) ▼
Malaysia	34 (1.7) ▼
Thailand	34 (2.3) ▼
Bahrain	27 (1.9) ▼
Jordan	27 (1.6) ▼
Kuwait	24 (2.2) ▼
Oman	23 (1.5) ▼
South Africa (9)	22 (1.6) ▼
Saudi Arabia	21 (2.0) ▼
Botswana (9)	18 (1.5) ▼

Content Domain: Number
Cognitive Domain: Knowing
Description: Completes a table of equivalent proportions

This table shows the number of pieces of paper in a stack and the height of the stack.

Complete the table.

Number of pieces of paper in the stack	100	150	200
Height of the stack (mm)	8	12	16

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	79 (3.3) ▲
Ontario, Canada	67 (2.3) ▲
Norway (8)	66 (2.0) ▲
Dubai, UAE	61 (2.0) ▲
[1] Florida, US	49 (4.1)
† Buenos Aires, Argentina	35 (2.7) ▼
Abu Dhabi, UAE	34 (2.3) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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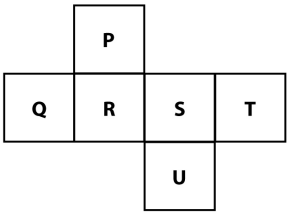
Exhibit 2.12.4: Intermediate International Benchmark – Example Item 4

Country	Percent Correct
Korea, Rep. of	94 (1.1) ▲
Japan	92 (1.0) ▲
Chinese Taipei	90 (1.1) ▲
[2] Singapore	88 (1.1) ▲
Hong Kong SAR	88 (1.3) ▲
† New Zealand	78 (1.4) ▲
Australia	77 (1.6) ▲
Hungary	77 (2.0) ▲
Ireland	76 (2.1) ▲
England	75 (1.9) ▲
[2] Italy	73 (2.1) ▲
[1] † Canada	71 (1.5) ▲
[2] Lithuania	68 (2.3) ▲
Norway (9)	67 (2.3) ▲
Slovenia	64 (2.3) ▲
Sweden	63 (2.0)
Chile	62 (2.1)
Turkey	60 (2.2)
Russian Federation	60 (2.7)
International Avg.	60 (0.3)
† United States	60 (1.5)
Iran, Islamic Rep. of	57 (1.9)
Malaysia	57 (1.8)
Kazakhstan	56 (2.8)
[3] Israel	56 (2.1)
Malta	56 (1.8) ▼
Bahrain	55 (2.0) ▼
Qatar	53 (1.9) ▼
Thailand	53 (2.2) ▼
United Arab Emirates	53 (1.4) ▼
[1] [2] Georgia	50 (2.5) ▼
Morocco	48 (1.5) ▼
Oman	38 (1.3) ▼
Kuwait	36 (2.1) ▼
Jordan	36 (2.0) ▼
South Africa (9)	32 (2.0) ▼
Lebanon	32 (2.3) ▼
Saudi Arabia	32 (2.5) ▼
Egypt	30 (2.0) ▼
Botswana (9)	27 (2.0) ▼

Content Domain: Geometry
Cognitive Domain: Reasoning
Description: Identifies opposite faces of a cube given its net



Liza constructed a cube by folding the net shown above. Which square face is opposite face Q?

Ⓐ P
● S
Ⓒ T
Ⓓ U

Country	Percent Correct
Benchmarking Participants	
‡ Quebec, Canada	73 (2.6) ▲
Ontario, Canada	69 (2.2) ▲
Norway (8)	61 (2.3)
Dubai, UAE	61 (2.3)
[1] Florida, US	54 (2.4) ▼
† Buenos Aires, Argentina	53 (3.0) ▼
Abu Dhabi, UAE	52 (2.5) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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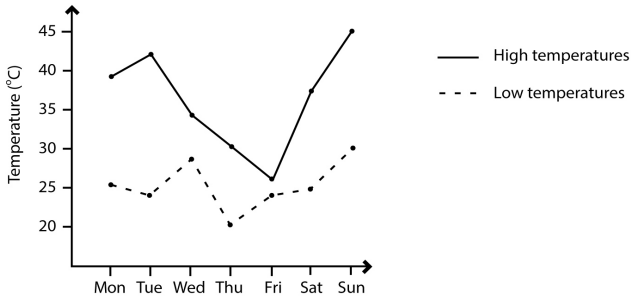
Exhibit 2.12.5: Intermediate International Benchmark – Example Item 5

Country	Percent Correct
Korea, Rep. of	83 (1.5) ▲
Japan	83 (1.3) ▲
Chinese Taipei	80 (1.5) ▲
[2] Singapore	80 (1.4) ▲
Hong Kong SAR	78 (2.0) ▲
[2] Italy	73 (2.2) ▲
Russian Federation	72 (2.9) ▲
England	70 (2.0) ▲
[1] † Canada	70 (1.8) ▲
Ireland	68 (2.3) ▲
[2] Lithuania	67 (2.2) ▲
Turkey	66 (1.8) ▲
† New Zealand	66 (1.5) ▲
Thailand	65 (2.1)
Hungary	65 (2.1)
Malaysia	65 (1.8)
Kazakhstan	64 (3.1)
† United States	64 (1.7)
Norway (9)	64 (2.2)
Australia	63 (1.5)
[3] Israel	62 (1.6)
Chile	62 (2.0)
International Avg.	62 (0.3)
United Arab Emirates	61 (1.1)
Slovenia	60 (2.1)
Sweden	60 (2.6)
Malta	56 (2.3) ▼
Qatar	55 (2.5) ▼
Oman	54 (1.7) ▼
Lebanon	54 (2.7) ▼
[1] [2] Georgia	54 (2.8) ▼
Botswana (9)	54 (1.8) ▼
South Africa (9)	52 (1.4) ▼
Bahrain	51 (2.4) ▼
Kuwait	50 (2.3) ▼
Iran, Islamic Rep. of	48 (2.2) ▼
Saudi Arabia	46 (2.5) ▼
Jordan	46 (1.9) ▼
Egypt	42 (1.9) ▼
Morocco	39 (1.7) ▼

Content Domain: Data and Chance
Cognitive Domain: Knowing
Description: Reads values from two line graphs to solve a problem

Temperature Chart of a Week in Zedland



The graph above shows the daily high and low temperatures for a week at a place in Zedland. On which day was the difference between the highest and lowest temperatures 10 °C?

Ⓐ Wednesday
● Thursday
Ⓒ Friday
Ⓓ Saturday

Country	Percent Correct
Benchmarking Participants	
‡ Quebec, Canada	77 (2.4) ▲
Ontario, Canada	68 (2.4) ▲
Dubai, UAE	67 (1.5) ▲
[1] Florida, US	62 (3.5)
Norway (8)	61 (2.1)
Abu Dhabi, UAE	58 (2.2)
† Buenos Aires, Argentina	40 (2.8) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.13: Description of the TIMSS 2015 High International Benchmark (550) of Mathematics Achievement

550 High International Benchmark

Summary

Students can apply their understanding and knowledge in a variety of relatively complex situations. They can use information to solve problems involving different types of numbers and operations. They can relate fractions, decimals, and percentages to each other. Students at this level show basic procedural knowledge related to algebraic expressions. They can solve a variety of problems with angles including those involving triangles, parallel lines, rectangles, and similar figures. Students can interpret data in a variety of graphs and solve simple problems involving outcomes and probabilities.

Students can use information to solve problems involving different types of numbers and operations. They can relate fractions, decimals, ratios, and percentages to each other. They can solve problems with fractions, proportions, and percentages.

Students at this level show basic procedural knowledge related to algebraic expressions. They can evaluate a variety of expressions and formulas. They can identify algebraic expressions that correspond to situations. Students can identify the solutions of linear equations and a pair of simultaneous linear equations, and identify the values that satisfy two inequalities. They can determine a specific term of a numerical or geometric pattern.

Students can solve a variety of problems with angles including those involving triangles, parallel lines, rectangles, and similar figures. They can draw an angle to meet given specifications and the reflection of a shape. They can visualize rectangular solids.

Students can interpret data from pie charts, line graphs, bar graphs, and pictographs to solve problems and provide explanations. They can calculate means. They can solve simple problems involving outcomes and probabilities.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.13.1: High International Benchmark – Example Item 1

Country	Percent Full Credit
[2] Singapore	70 (1.6) ▲
Chinese Taipei	66 (1.8) ▲
Korea, Rep. of	63 (2.2) ▲
Hong Kong SAR	63 (2.6) ▲
Japan	62 (1.8) ▲
Ireland	55 (2.2) ▲
[1] † Canada	55 (2.1) ▲
[2] Lithuania	52 (2.3) ▲
[3] Israel	51 (2.3) ▲
Norway (9)	50 (2.4) ▲
Sweden	48 (2.3) ▲
England	48 (2.5) ▲
Hungary	48 (2.7) ▲
Russian Federation	48 (2.2) ▲
† United States	47 (1.8) ▲
† New Zealand	40 (2.0) ▲
[2] Italy	40 (2.7) ▲
Slovenia	39 (1.9) ▲
Australia	38 (1.7) ▲
Malta	37 (1.9) ▲
International Avg.	31 (0.3)
Malaysia	21 (1.4) ▼
Turkey	21 (1.8) ▼
Kazakhstan	20 (2.2) ▼
United Arab Emirates	20 (1.0) ▼
[1] [2] Georgia	18 (2.0) ▼
Qatar	17 (1.7) ▼
Thailand	14 (1.6) ▼
Chile	14 (1.5) ▼
Bahrain	11 (1.5) ▼
Oman	8 (0.9) ▼
Kuwait	8 (1.9) ▼
Iran, Islamic Rep. of	6 (1.1) ▼
Botswana (9)	5 (0.8) ▼
Lebanon	4 (1.1) ▼
South Africa (9)	4 (0.9) ▼
Egypt	4 (0.6) ▼
Morocco	4 (0.6) ▼
Jordan	3 (0.6) ▼
Saudi Arabia	2 (0.5) ▼

Content Domain: Number
Cognitive Domain: Applying
Description: Part B - Selects and combines information from two sources to solve a multi-step word problem

Mobile Telephone

Kate was going to buy a new Supertext mobile phone.

She looked at these two advertisements.

Company X	Company Y
The New Supertext Mobile Phone Get this great phone free! 250 zeds monthly charge Calls 3 zeds per minute Text messages 2 zeds each	The New Supertext Mobile Phone Cheap rates for calls and texts! Buy the phone for 2500 zeds Only 50 zeds monthly charge Calls only 2 zeds per minute Text messages only 1 zed each

Kate decided to compare how much it would cost to have the phone for a year without making any calls or sending any text messages.

A. Work out the cost of having the Supertext phone for a year from Company X and from Company Y.

Costs: Company X 3000 Company Y 3100

B. Kate then estimated how much she was likely to use the phone. She thought she would talk on the phone for 500 minutes in the first year and send 200 text messages. Find out how much she would pay for the phone in the first year from each company. Do not forget the monthly charge and other costs.

Costs: Company X 4900 Company Y 4300

The answer shown for part B illustrates the type of response that would receive full credit (2 points).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	64 (3.1) ▲
Ontario, Canada	53 (2.4) ▲
Norway (8)	40 (1.9) ▲
[1] Florida, US	37 (3.7)
Dubai, UAE	34 (1.9)
Abu Dhabi, UAE	16 (2.1) ▼
† Buenos Aires, Argentina	11 (1.6) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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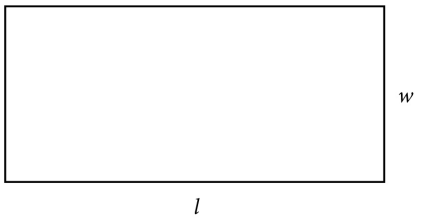
Exhibit 2.13.2: High International Benchmark – Example Item 2

Country	Percent Correct
[2] Singapore	82 (1.6) ▲
Hong Kong SAR	78 (1.9) ▲
Korea, Rep. of	77 (1.9) ▲
Chinese Taipei	76 (1.4) ▲
Russian Federation	75 (1.7) ▲
Japan	74 (1.8) ▲
Kazakhstan	70 (2.3) ▲
[1] † Canada	64 (1.6) ▲
† United States	60 (1.5) ▲
[2] Lithuania	59 (2.6) ▲
Ireland	57 (2.2) ▲
England	56 (1.9) ▲
Malta	56 (2.1) ▲
[3] Israel	53 (2.1)
Australia	52 (1.9)
International Avg.	51 (0.3)
[1 2] Georgia	51 (2.8)
Bahrain	50 (2.5)
Iran, Islamic Rep. of	50 (2.1)
United Arab Emirates	50 (1.4)
† New Zealand	49 (2.1)
Hungary	48 (2.1)
[2] Italy	48 (2.2)
Turkey	47 (2.5)
Norway (9)	47 (2.6)
Lebanon	46 (2.9)
Qatar	46 (1.6) ▼
Slovenia	45 (2.1) ▼
Egypt	45 (2.3) ▼
Sweden	44 (2.4) ▼
Kuwait	41 (2.5) ▼
Morocco	39 (1.2) ▼
Jordan	39 (2.1) ▼
Thailand	38 (2.4) ▼
Malaysia	36 (1.7) ▼
Botswana (9)	35 (1.9) ▼
Oman	32 (1.7) ▼
South Africa (9)	29 (1.3) ▼
Chile	29 (1.8) ▼
Saudi Arabia	26 (2.0) ▼

Content Domain: Algebra
Cognitive Domain: Applying
Description: Identifies the formula that represents a situation involving area



The shape above is a rectangle, with length l, and width w.

If the length is doubled and the width stays the same, which formula gives the area (A) of the new rectangle?

Ⓐ $A = 2l + 2w$

Ⓑ $A = 2l + 4w$

● $A = 2lw$

Ⓓ $A = 4lw$

Country	Percent Correct
Benchmarking Participants	
‡ Quebec, Canada	70 (3.1) ▲
Dubai, UAE	63 (1.6) ▲
Ontario, Canada	62 (2.0) ▲
[1] Florida, US	54 (3.5)
Abu Dhabi, UAE	43 (2.5) ▼
Norway (8)	33 (2.1) ▼
† Buenos Aires, Argentina	19 (2.0) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.13.3: High International Benchmark – Example Item 3

Country	Percent Full Credit
[2] Singapore	77 (1.9) ▲
Hong Kong SAR	75 (2.2) ▲
Chinese Taipei	73 (1.9) ▲
Korea, Rep. of	69 (2.0) ▲
Kazakhstan	57 (2.7) ▲
Russian Federation	57 (2.3) ▲
Japan	55 (1.8) ▲
† United States	51 (1.5) ▲
Slovenia	48 (2.2) ▲
Lebanon	43 (2.6) ▲
[1] † Canada	38 (1.7) ▲
United Arab Emirates	37 (1.2) ▲
[3] Israel	37 (2.1) ▲
Hungary	36 (2.3)
Malta	36 (1.9)
Ireland	35 (2.2)
[1] [2] Georgia	35 (2.7)
[2] Italy	33 (2.3)
[2] Lithuania	32 (2.1)
International Avg.	**32 (0.3)**
Australia	28 (2.0) ▼
Malaysia	28 (1.6) ▼
England	26 (2.0) ▼
Egypt	23 (1.9) ▼
Bahrain	22 (2.2) ▼
Qatar	21 (1.8) ▼
† New Zealand	20 (1.8) ▼
Turkey	20 (1.8) ▼
Oman	19 (1.4) ▼
Iran, Islamic Rep. of	17 (1.4) ▼
Jordan	16 (1.4) ▼
Chile	13 (1.7) ▼
Saudi Arabia	13 (1.7) ▼
Thailand	12 (1.7) ▼
South Africa (9)	10 (1.4) ▼
Norway (9)	10 (1.4) ▼
Kuwait	10 (1.5) ▼
Sweden	8 (1.2) ▼
Morocco	8 (0.8) ▼
Botswana (9)	6 (0.9) ▼

Content Domain: Algebra
Cognitive Domain: Knowing
Description: Finds the value of an algebraic expression involving parentheses and negative terms

$a = 5$ and $b = 2$.
What is the value of $a^2b - 3(a - b)$?

Answer: 41

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
Dubai, UAE	47 (2.0) ▲
‡ Quebec, Canada	41 (3.0) ▲
Ontario, Canada	38 (2.1) ▲
[1] Florida, US	35 (2.9)
Abu Dhabi, UAE	29 (2.4)
† Buenos Aires, Argentina	14 (2.0) ▼
Norway (8)	2 (0.5) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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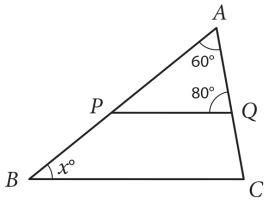
Exhibit 2.13.4: High International Benchmark – Example Item 4

Country	Percent Full Credit
Korea, Rep. of	87 (1.5) ▲
Japan	86 (1.4) ▲
[2] Singapore	85 (1.2) ▲
Hong Kong SAR	80 (2.3) ▲
Chinese Taipei	74 (1.5) ▲
Russian Federation	64 (2.7) ▲
Kazakhstan	62 (2.8) ▲
[3] Israel	53 (2.0) ▲
Lebanon	51 (2.6) ▲
England	49 (2.5) ▲
[1] † Canada	49 (2.0) ▲
Hungary	47 (2.6)
Ireland	47 (2.5)
Slovenia	45 (2.4)
Malta	44 (2.2)
International Avg.	43 (0.3)
† United States	42 (1.6)
Norway (9)	41 (2.4)
[2] Lithuania	41 (2.7)
Egypt	40 (2.0)
Iran, Islamic Rep. of	39 (1.9) ▼
Turkey	37 (1.7) ▼
Sweden	36 (2.8) ▼
[2] Italy	36 (2.2) ▼
United Arab Emirates	34 (1.5) ▼
† New Zealand	34 (2.0) ▼
Morocco	33 (1.7) ▼
Malaysia	32 (1.8) ▼
Australia	32 (2.0) ▼
Qatar	31 (1.9) ▼
Oman	30 (1.8) ▼
Jordan	30 (2.0) ▼
Thailand	30 (2.1) ▼
[1] [2] Georgia	29 (2.8) ▼
Botswana (9)	27 (1.5) ▼
Kuwait	24 (2.2) ▼
Chile	22 (1.8) ▼
South Africa (9)	22 (1.7) ▼
Bahrain	20 (1.3) ▼
Saudi Arabia	13 (1.9) ▼

Content Domain: Geometry
Cognitive Domain: Applying
Description: Solves a problem involving angles of a triangle and parallel lines



Lines PQ and BC are parallel.

What is the value of x?

Answer: 40

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	58 (3.2) ▲
Ontario, Canada	48 (2.3) ▲
Dubai, UAE	47 (3.0)
Norway (8)	36 (2.0) ▼
[1] Florida, US	35 (3.3) ▼
Abu Dhabi, UAE	30 (2.2) ▼
† Buenos Aires, Argentina	15 (2.0) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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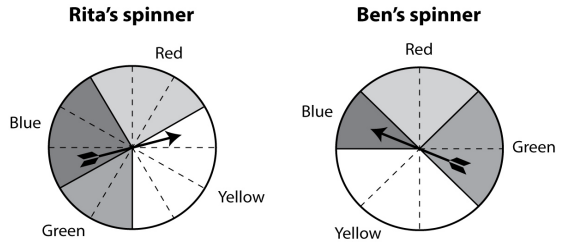
Exhibit 2.13.5: High International Benchmark – Example Item 5

Country	Percent Correct	
Japan	75 (1.8)	▲
Chinese Taipei	74 (1.9)	▲
Hong Kong SAR	71 (2.1)	▲
[2] Singapore	71 (1.5)	▲
Australia	70 (1.6)	▲
Korea, Rep. of	70 (2.0)	▲
[1] † Canada	69 (1.4)	▲
England	68 (2.2)	▲
Norway (9)	67 (2.4)	▲
Hungary	67 (2.2)	▲
Ireland	65 (2.6)	▲
† United States	64 (1.2)	▲
† New Zealand	62 (2.3)	▲
Sweden	60 (2.4)	▲
[2] Italy	57 (2.6)	▲
Slovenia	57 (2.3)	▲
Malta	57 (2.1)	▲
Bahrain	55 (1.6)	▲
[2] Lithuania	54 (2.5)	
[3] Israel	53 (1.7)	
International Avg.	51 (0.3)	
United Arab Emirates	49 (1.3)	▼
Turkey	48 (2.1)	
Chile	47 (1.6)	▼
Russian Federation	46 (2.5)	▼
Thailand	46 (2.1)	▼
Iran, Islamic Rep. of	44 (1.8)	▼
Qatar	43 (1.8)	▼
Jordan	39 (2.1)	▼
Kazakhstan	39 (2.6)	▼
Egypt	36 (1.9)	▼
Malaysia	36 (2.1)	▼
Saudi Arabia	35 (2.3)	▼
Oman	33 (1.7)	▼
Morocco	33 (1.2)	▼
Kuwait	32 (2.2)	▼
Botswana (9)	30 (1.6)	▼
South Africa (9)	30 (1.4)	▼
Lebanon	27 (2.2)	▼
[1] [2] Georgia	25 (2.1)	▼

Content Domain: Data and Chance
Cognitive Domain: Applying
Description: Compares the chances of two outcomes



Suppose Rita and Ben spin their spinners.

Which of the following is true?

Ⓐ Red is more likely on Ben's spinner than on Rita's

Ⓑ Red is more likely on Rita's spinner than on Ben's

Ⓒ Red is impossible on both spinners

● Red is equally likely on both spinners

Country	Percent Correct	
Benchmarking Participants		
‡ Quebec, Canada	74 (2.8)	▲
Ontario, Canada	66 (2.0)	▲
Norway (8)	58 (2.6)	▲
Dubai, UAE	56 (2.0)	▲
[1] Florida, US	56 (3.3)	
Abu Dhabi, UAE	48 (2.3)	
† Buenos Aires, Argentina	42 (2.8)	▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
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SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.14: Description of the TIMSS 2015 Advanced International Benchmark (625) of Mathematics Achievement

625 Advanced International Benchmark

Summary

Students can apply and reason in a variety of problem situations, solve linear equations, and make generalizations. They can solve a variety of fraction, proportion, and percent problems and justify their conclusions. Students can use their knowledge of geometric figures to solve a wide range of problems about area. They demonstrate understanding of the meaning of averages and can solve problems involving expected values.

Students can solve a variety of fraction, proportion, and percent problems and justify their conclusions. They can reason with different types of numbers in abstract and non-routine problems.

Students can write and solve linear equations in one or two variables. They can identify properties of linear functions from tables, graphs, and equations, including slopes and y-intercepts. Students can express generalizations either algebraically or in words, such as expressing the nth term in number patterns. They can simplify algebraic expressions.

Students can use their knowledge of geometric figures to solve a wide range of problems about area and surface area. They can use the Pythagorean theorem to find the area of a triangle, the distance between two points on a coordinate grid, and the perimeter of a trapezoid. Students can find points on a coordinate grid in problems involving geometric figures.

Students demonstrate understanding of the meaning of averages and can calculate means and medians. They can solve problems involving expected values.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.14.1: Advanced International Benchmark – Example Item 1

Country	Percent Full Credit
Japan	58 (1.9) ▲
[2] Singapore	54 (2.0) ▲
Chinese Taipei	50 (2.1) ▲
Korea, Rep. of	48 (2.1) ▲
Norway (9)	40 (2.0) ▲
Hong Kong SAR	39 (2.5) ▲
England	33 (1.8) ▲
[1] † Canada	32 (1.7) ▲
Ireland	32 (2.1) ▲
Slovenia	30 (2.0) ▲
Hungary	27 (1.9) ▲
[3] Israel	27 (1.8) ▲
Kazakhstan	26 (1.8) ▲
† New Zealand	24 (1.4) ▲
Australia	24 (1.5) ▲
Sweden	23 (2.2)
Malta	23 (1.7)
† United States	22 (1.3)
Russian Federation	21 (1.6)
International Avg.	20 (0.2)
Turkey	20 (1.8)
[2] Italy	16 (1.3) ▼
[2] Lithuania	15 (1.7) ▼
[1 2] Georgia	14 (1.9) ▼
Lebanon	10 (1.3) ▼
United Arab Emirates	10 (0.8) ▼
Chile	9 (1.1) ▼
Qatar	8 (1.0) ▼
Malaysia	7 (0.9) ▼
Bahrain	7 (0.9) ▼
Iran, Islamic Rep. of	5 (1.2) ▼
Kuwait	5 (0.9) ▼
Egypt	4 (0.8) ▼
Thailand	4 (0.9) ▼
South Africa (9)	4 (0.8) ▼
Oman	4 (0.5) ▼
Saudi Arabia	4 (1.0) ▼
Jordan	3 (0.7) ▼
Botswana (9)	3 (0.5) ▼
Morocco	2 (0.3) ▼

Content Domain: Number
Cognitive Domain: Reasoning
Description: Reasons about fractional parts of a whole in a word problem and explains answer

Tom and his brother Peter received the same amount of money.

Tom spent $\frac{1}{3}$ of his money on books. He spent $\frac{3}{5}$ of the remaining money to buy a new pair of shoes.

Peter spent $\frac{3}{5}$ of his money to buy a new pair of shoes.

Who spent more for shoes?

(Check one box.)

- ☐ Tom spent more money for shoes.
- ☒ Peter spent more money for shoes.
- ☐ They both spent the same amount for shoes.

Explain your answer.

$\frac{2}{3} \times \frac{3}{5} = \frac{2}{5}$

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	35 (2.3) ▲
Norway (8)	34 (2.4) ▲
Ontario, Canada	31 (1.9) ▲
[1] Florida, US	16 (2.3)
Dubai, UAE	14 (1.1) ▼
Abu Dhabi, UAE	9 (1.5) ▼
† Buenos Aires, Argentina	5 (1.1) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.14.2: Advanced International Benchmark – Example Item 2

Country	Percent Correct
Japan	66 (2.0) ▲
Korea, Rep. of	63 (2.1) ▲
Russian Federation	60 (2.1) ▲
[2] Singapore	58 (1.9) ▲
[3] Israel	56 (1.9) ▲
Chinese Taipei	56 (1.7) ▲
Hungary	55 (2.4) ▲
Kazakhstan	54 (3.0) ▲
† United States	54 (1.5) ▲
Ireland	51 (2.1) ▲
[2] Lithuania	50 (2.4) ▲
Bahrain	47 (1.8) ▲
Malta	47 (2.0) ▲
[1 2] Georgia	47 (2.8)
Jordan	45 (2.2)
Lebanon	43 (2.8)
United Arab Emirates	43 (1.1)
South Africa (9)	43 (1.7)
International Avg.	42 (0.3)
England	39 (2.1)
Botswana (9)	39 (1.5) ▼
Qatar	39 (2.5)
[2] Italy	39 (2.4)
Egypt	39 (2.0)
[1] † Canada	38 (1.6) ▼
Morocco	38 (1.5) ▼
Oman	38 (1.5) ▼
Kuwait	34 (2.8) ▼
Slovenia	34 (2.2) ▼
Hong Kong SAR	34 (2.5) ▼
Malaysia	33 (1.6) ▼
Australia	33 (1.6) ▼
† New Zealand	33 (2.1) ▼
Turkey	32 (1.8) ▼
Thailand	30 (1.9) ▼
Saudi Arabia	29 (2.3) ▼
Norway (9)	28 (2.1) ▼
Chile	26 (2.0) ▼
Iran, Islamic Rep. of	26 (1.9) ▼
Sweden	26 (2.5) ▼

Content Domain: Algebra
Cognitive Domain: Applying
Description: Identifies a linear equation given the y-intercept

Janet described the graph of a function:

- The graph is a straight line.
- The graph intercepts the y-axis at 3.

Which could be the function of Janet's graph?

Ⓐ $y = x^2 + 3$

Ⓑ $y = 3x + 1$

Ⓒ $y = 3x^2 - 1$

● $y = x + 3$

Country	Percent Correct
Benchmarking Participants	
Dubai, UAE	50 (1.8) ▲
‡ Quebec, Canada	47 (3.0)
[1] Florida, US	46 (3.0)
Abu Dhabi, UAE	39 (2.0)
Ontario, Canada	35 (2.2) ▼
Norway (8)	21 (1.9) ▼
† Buenos Aires, Argentina	20 (2.0) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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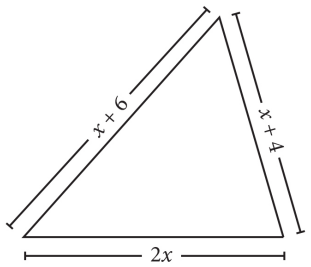
Exhibit 2.14.3: Advanced International Benchmark – Example Item 3

Country	Percent Full Credit
Korea, Rep. of	69 (1.8) ▲
Chinese Taipei	67 (2.0) ▲
[2] Singapore	65 (1.8) ▲
Hong Kong SAR	62 (2.7) ▲
Russian Federation	47 (2.6) ▲
[3] Israel	43 (2.2) ▲
Kazakhstan	41 (3.2) ▲
Japan	41 (2.2) ▲
Hungary	38 (2.4) ▲
[2] Lithuania	32 (2.8) ▲
[1 2] Georgia	29 (2.3) ▲
Sweden	27 (2.3) ▲
Malta	26 (1.6) ▲
† United States	25 (1.5)
[1] † Canada	24 (1.4)
Ireland	23 (1.9)
International Avg.	22 (0.3)
Turkey	18 (1.8) ▼
Iran, Islamic Rep. of	16 (1.7) ▼
Qatar	15 (1.6) ▼
England	15 (1.8) ▼
Lebanon	15 (1.9) ▼
United Arab Emirates	13 (0.7) ▼
Norway (9)	13 (1.4) ▼
Oman	11 (1.1) ▼
Australia	11 (1.1) ▼
[2] Italy	10 (1.6) ▼
Bahrain	10 (1.0) ▼
Egypt	10 (1.4) ▼
Malaysia	9 (1.0) ▼
Slovenia	9 (1.2) ▼
† New Zealand	8 (1.1) ▼
Thailand	8 (1.4) ▼
Jordan	7 (1.1) ▼
Chile	6 (1.1) ▼
Morocco	4 (0.6) ▼
Kuwait	4 (0.7) ▼
South Africa (9)	2 (0.6) ▼
Saudi Arabia	2 (0.7) ▼
Botswana (9)	1 (0.3) ▼

Content Domain: Algebra
Cognitive Domain: Applying
Description: Constructs and uses the solution of a linear equation to solve a word problem



The sum of the lengths of the sides of this triangle is 30 cm.

A. Write an equation that would enable you to find the value of x.

Equation: $4x + 10 = 30$

B. What is the length of the LONGEST side of the triangle in centimeters?

Answer: 11 cm

The answer shown illustrates the type of response that would receive full credit (2 points).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	44 (3.7) ▲
Dubai, UAE	23 (1.8)
[1] Florida, US	22 (3.2)
Ontario, Canada	15 (1.5) ▼
† Buenos Aires, Argentina	11 (1.9) ▼
Abu Dhabi, UAE	7 (1.4) ▼
Norway (8)	5 (1.0) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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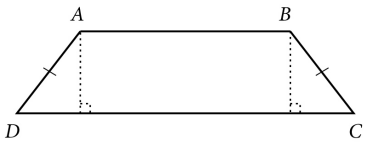
Exhibit 2.14.4: Advanced International Benchmark – Example Item 4

Country	Percent Correct
Chinese Taipei	72 (1.6) ▲
[2] Singapore	68 (1.8) ▲
Hong Kong SAR	55 (2.5) ▲
Korea, Rep. of	48 (2.3) ▲
Kazakhstan	47 (2.9) ▲
[2] Italy	46 (2.4) ▲
Japan	45 (2.3) ▲
Russian Federation	43 (2.5) ▲
[3] Israel	40 (2.1) ▲
Hungary	38 (2.4) ▲
Turkey	38 (1.8) ▲
[2] Lithuania	34 (2.3)
† United States	33 (1.6)
International Avg.	32 (0.3)
[1] † Canada	31 (1.6)
England	31 (2.0)
Malaysia	31 (1.8)
[1] [2] Georgia	29 (2.7)
Oman	28 (1.5) ▼
Iran, Islamic Rep. of	28 (2.1) ▼
Egypt	28 (1.7) ▼
Australia	27 (1.6) ▼
United Arab Emirates	26 (1.3) ▼
Slovenia	26 (1.8) ▼
† New Zealand	26 (1.7) ▼
Morocco	25 (1.4) ▼
Jordan	25 (1.8) ▼
Norway (9)	25 (2.0) ▼
Malta	25 (1.8) ▼
Ireland	25 (2.0) ▼
Thailand	24 (1.7) ▼
Chile	24 (1.9) ▼
Qatar	23 (1.6) ▼
Bahrain	23 (1.5) ▼
Botswana (9)	22 (1.6) ▼
Kuwait	21 (2.3) ▼
Saudi Arabia	20 (2.0) ▼
South Africa (9)	20 (1.3) ▼
Lebanon	18 (1.9) ▼
Sweden	18 (1.9) ▼

Content Domain: Geometry
Cognitive Domain: Reasoning
Description: Uses the Pythagorean theorem in finding the perimeter of a trapezoid



ABCD is a trapezoid with $AB = 10$ cm and $CD = 16$ cm. $AD = BC$. The distance between the parallel lines, *AB* and *CD*, is 4 cm. What is its perimeter?

● 36 cm
Ⓑ 34 cm
Ⓒ 32 cm
Ⓓ 30 cm

Country	Percent Correct
Benchmarking Participants	
Dubai, UAE	32 (1.8)
‡ Quebec, Canada	32 (2.9)
Ontario, Canada	30 (2.1)
[1] Florida, US	24 (3.0) ▼
Abu Dhabi, UAE	22 (2.1) ▼
Norway (8)	19 (1.7) ▼
† Buenos Aires, Argentina	16 (1.6) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 2.14.5: Advanced International Benchmark – Example Item 5

Country	Percent Full Credit
[2] Singapore	64 (1.8) ▲
Hong Kong SAR	59 (2.6) ▲
[2] Lithuania	59 (2.4) ▲
Korea, Rep. of	59 (2.0) ▲
Chinese Taipei	55 (1.7) ▲
Japan	45 (2.0) ▲
Norway (9)	43 (2.4) ▲
Ireland	39 (2.1) ▲
Hungary	39 (2.3) ▲
[2] Italy	38 (2.3) ▲
[3] Israel	38 (1.9) ▲
Slovenia	37 (2.0) ▲
Turkey	35 (2.4) ▲
[1] † Canada	34 (1.8) ▲
Russian Federation	27 (2.6)
Kazakhstan	27 (2.1)
† United States	26 (1.4)
International Avg.	25 (0.3)
England	25 (2.0)
Australia	23 (1.5)
[1] [2] Georgia	23 (2.0)
Sweden	22 (2.0)
† New Zealand	19 (1.9) ▼
Malta	17 (1.3) ▼
Iran, Islamic Rep. of	16 (1.7) ▼
United Arab Emirates	14 (1.0) ▼
Chile	11 (1.2) ▼
Qatar	10 (1.0) ▼
Bahrain	10 (1.4) ▼
Lebanon	9 (1.5) ▼
Thailand	8 (1.3) ▼
Malaysia	8 (0.8) ▼
Kuwait	6 (1.8) ▼
Oman	5 (0.8) ▼
Egypt	4 (0.8) ▼
Morocco	4 (0.6) ▼
Jordan	4 (0.6) ▼
Saudi Arabia	3 (0.9) ▼
South Africa (9)	3 (0.5) ▼
Botswana (9)	2 (0.5) ▼

Content Domain: Data and Chance
Cognitive Domain: Reasoning
Description: Uses understanding of average to solve a problem

Ahmed had the following scores out of 10 on his first 4 mathematics tests: 9, 7, 8, 8. Ahmed has 1 more test with a maximum of 10 points and says he wants to get an overall average of 9. Is it possible for him to do this?

Explain your answer.

No, Ahmed would have to score 13 to do this.

The answer shown illustrates the type of response that would receive full credit (1 point).

Country	Percent Full Credit
Benchmarking Participants	
‡ Quebec, Canada	40 (3.5) ▲
Norway (8)	34 (2.1) ▲
Ontario, Canada	33 (2.2) ▲
Dubai, UAE	25 (2.1)
† Buenos Aires, Argentina	20 (2.3) ▼
[1] Florida, US	19 (2.3) ▼
Abu Dhabi, UAE	9 (1.9) ▼

▲ Percent significantly higher than international average
▼ Percent significantly lower than international average

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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TIMSS 2015

CHAPTER 3: ACHIEVEMENT IN CONTENT AND COGNITIVE DOMAINS

TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Achievement by Content Domains

Within mathematics, TIMSS at the fourth grade provided results for three content domains—Number, Geometric Shapes and Measures, and Data Display. Most countries demonstrated strengths in one or two content domains compared to mathematics achievement overall, and weaknesses in one or two content domains.

TIMSS 2015: 49 Countries

Number

Relative Strength: **23** Countries

Relative Weakness: **14** Countries

Geometric Shapes and Measures

Relative Strength: **17** Countries

Relative Weakness: **21** Countries

Data Display

Relative Strength: **17** Countries

Relative Weakness: **20** Countries

Trends 2011–2015: 41 Countries

	Countries Improved	Countries Declined
Number	20	5
Geometric Shapes and Measures	20	3
Data Display	18	6

Differences in Achievement by Gender in the Content Domains

Number of Countries Where Boys Outperformed Girls in the Content Domains

- 21 Number
- 14 Geometric Shapes and Measures
- 2 Data Display

Number of Countries Where Girls Outperformed Boys in the Content Domains

- 7 Number
- 9 Geometric Shapes and Measures
- 13 Data Display

Achievement by Cognitive Domains

TIMSS at the fourth grade provided results for three cognitive domains—Knowing, Applying, and Reasoning. Although there was some balance in achievement across cognitive domains, most countries had at least one strength and one weakness compared to mathematics achievement overall.

TIMSS 2015: 49 Countries

Knowing

Relative Strength: **17** Countries

Relative Weakness: **19** Countries

Applying

Relative Strength: **11** Countries

Relative Weakness: **10** Countries

Reasoning

Relative Strength: **18** Countries

Relative Weakness: **21** Countries

Trends 2011–2015: 41 Countries

	Countries Improved	Countries Declined
Knowing	21	7
Applying	22	4
Reasoning	20	2

Differences in Achievement by Gender in the Cognitive Domains

Number of Countries Where Boys Outperformed Girls in the Cognitive Domains

- 16 Knowing
- 13 Applying
- 12 Reasoning

Number of Countries Where Girls Outperformed Boys in the Cognitive Domains

- 6 Knowing
- 8 Applying
- 8 Reasoning

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Achievement by Content Domains

Within mathematics, TIMSS at the eighth grade provided results for four content domains—Number, Algebra, Geometry, and Data and Chance. Most countries demonstrated strengths in one or two content domains compared to achievement overall, and weaknesses in one or two content domains.

TIMSS 2015: 39 Countries

Number
Relative Strength: 15 Countries
Relative Weakness: 12 Countries

Algebra
Relative Strength: 18 Countries
Relative Weakness: 14 Countries

Geometry
Relative Strength: 12 Countries
Relative Weakness: 19 Countries

Data and Chance
Relative Strength: 13 Countries
Relative Weakness: 22 Countries

Trends 2011–2015: 34 Countries

	Countries Improved	Countries Declined
Number	16	4
Algebra	14	4
Geometry	17	3
Data and Chance	13	5

Differences in Achievement by Gender in the Content Domains

Achievement differences in content domains by gender showed a large advantage for boys in Number. Girls had a large advantage in Algebra and also did better in Geometry.

Number of Countries Where Boys Outperformed Girls in the Content Domains
- 17 Number
- 0 Algebra
- 2 Geometry
- 6 Data and Chance

Number of Countries Where Girls Outperformed Boys in the Content Domains
- 4 Number
- 21 Algebra
- 8 Geometry
- 7 Data and Chance

Achievement by Cognitive Domains

TIMSS at the eighth grade provided results for three cognitive domains—Knowing, Applying, and Reasoning. Although there was some balance in achievement across cognitive domains, most countries had at least one strength and one weakness compared to mathematics achievement overall.

TIMSS 2015: 39 Countries

Knowing
Relative Strength: 14 Countries
Relative Weakness: 13 Countries

Applying
Relative Strength: 6 Countries
Relative Weakness: 13 Countries

Reasoning
Relative Strength: 13 Countries
Relative Weakness: 16 Countries

Trends 2011–2015: 34 Countries

	Countries Improved	Countries Declined
Knowing	16	5
Applying	17	4
Reasoning	18	4

Differences in Achievement by Gender in the Cognitive Domains

Differences in the cognitive domains by gender show an advantage for girls in the Reasoning domain.

Number of Countries Where Boys Outperformed Girls in the Cognitive Domains
- 4 Knowing
- 6 Applying
- 2 Reasoning

Number of Countries Where Girls Outperformed Boys in the Cognitive Domains
- 9 Knowing
- 5 Applying
- 13 Reasoning

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

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TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Exhibit 3.1: Achievement in Mathematics Content Domains

Country	Overall Mathematics Average Scale Score	Number (89 items)		Geometric Shapes and Measures (56 items)		Data Display (24 items)	
		Average Scale Score	Difference from Overall Mathematics Score	Average Scale Score	Difference from Overall Mathematics Score	Average Scale Score	Difference from Overall Mathematics Score
2 Singapore	618 (3.8)	630 (4.2)	12 (1.1) ▲	607 (4.2)	-10 (1.5) ▼	600 (4.1)	-18 (1.7) ▼
† Hong Kong SAR	615 (2.9)	616 (3.1)	2 (1.4)	617 (3.4)	2 (1.9)	611 (3.8)	-4 (2.9)
Korea, Rep. of	608 (2.2)	610 (2.6)	2 (1.4)	610 (2.3)	2 (1.8)	607 (2.6)	-1 (1.3)
Chinese Taipei	597 (1.9)	599 (1.8)	3 (1.2) ▲	597 (3.0)	0 (2.1)	591 (2.2)	-5 (1.3) ▼
Japan	593 (2.0)	592 (1.9)	-1 (1.1)	601 (2.5)	9 (1.3) ▲	593 (2.6)	1 (1.3)
‡ Northern Ireland	570 (2.9)	574 (3.1)	4 (1.0) ▲	566 (3.3)	-4 (2.0) ▼	567 (3.8)	-4 (2.4)
Russian Federation	564 (3.4)	567 (3.3)	3 (1.2) ▲	557 (4.4)	-7 (1.4) ▼	573 (3.6)	9 (1.1) ▲
Norway (5)	549 (2.5)	542 (2.4)	-7 (1.1) ▼	559 (3.5)	10 (1.8) ▲	566 (3.0)	17 (1.2) ▲
Ireland	547 (2.1)	551 (2.2)	4 (1.2) ▲	542 (2.9)	-5 (2.1) ▼	548 (3.8)	0 (3.4)
England	546 (2.8)	547 (3.2)	1 (1.6)	542 (3.3)	-4 (1.6) ▼	552 (3.2)	6 (2.0) ▲
† Belgium (Flemish)	546 (2.1)	543 (2.1)	-3 (0.8) ▼	564 (2.3)	18 (1.3) ▲	523 (3.0)	-22 (2.5) ▼
Kazakhstan	544 (4.5)	552 (4.0)	7 (1.3) ▲	540 (5.8)	-5 (2.0) ▼	524 (5.3)	-20 (2.1) ▼
2 Portugal	541 (2.2)	541 (2.1)	-1 (0.9)	539 (2.6)	-2 (1.0) ▼	546 (2.8)	5 (1.9) ▲
2 † United States	539 (2.3)	546 (2.2)	6 (0.9) ▲	525 (2.6)	-14 (0.8) ▼	540 (2.8)	1 (2.1)
2 † Denmark	539 (2.7)	535 (2.7)	-4 (1.4) ▼	555 (3.2)	16 (1.5) ▲	526 (3.5)	-13 (2.3) ▼
2 Lithuania	535 (2.5)	538 (2.6)	3 (1.1) ▲	526 (3.0)	-10 (2.2) ▼	540 (3.6)	5 (2.4) ▲
Finland	535 (2.0)	532 (2.1)	-4 (1.0) ▼	539 (2.5)	4 (1.7) ▲	542 (3.3)	6 (2.6) ▲
Poland	535 (2.1)	534 (2.3)	0 (1.1)	534 (2.5)	-1 (1.7)	538 (2.8)	3 (2.0)
† Netherlands	530 (1.7)	531 (2.2)	1 (1.4)	522 (1.9)	-8 (1.2) ▼	539 (3.4)	9 (2.6) ▲
Hungary	529 (3.2)	531 (3.0)	2 (0.9) ▲	536 (3.6)	7 (1.6) ▲	513 (3.6)	-17 (1.2) ▼
Czech Republic	528 (2.2)	528 (2.4)	0 (1.1)	531 (2.5)	3 (0.9) ▲	525 (3.0)	-3 (1.7)
Bulgaria	524 (5.3)	529 (4.6)	5 (1.4) ▲	525 (5.9)	1 (2.0)	504 (7.6)	-20 (3.1) ▼
Cyprus	523 (2.7)	528 (2.5)	5 (0.9) ▲	524 (2.8)	1 (1.3)	507 (3.8)	-16 (2.6) ▼
Germany	522 (2.0)	515 (2.1)	-7 (0.9) ▼	531 (2.5)	9 (1.5) ▲	535 (2.6)	13 (1.4) ▲
Slovenia	520 (1.9)	511 (1.8)	-9 (0.9) ▼	530 (2.1)	10 (1.6) ▲	540 (3.1)	20 (2.2) ▲
2 Sweden	519 (2.8)	514 (2.7)	-5 (1.4) ▼	523 (3.3)	4 (1.7) ▲	529 (3.9)	11 (2.8) ▲
3 Serbia	518 (3.5)	524 (3.4)	6 (1.0) ▲	503 (3.8)	-15 (1.8) ▼	517 (3.8)	-1 (2.3)
Australia	517 (3.1)	509 (3.1)	-8 (0.7) ▼	527 (3.3)	10 (1.6) ▲	533 (3.6)	15 (2.2) ▲
1 2 † Canada	511 (2.3)	503 (2.4)	-8 (1.0) ▼	517 (2.5)	7 (0.7) ▲	528 (2.7)	18 (1.0) ▲
2 Italy	507 (2.6)	510 (2.4)	3 (0.9) ▲	503 (2.8)	-3 (1.0) ▼	498 (2.9)	-9 (1.6) ▼
2 Spain	505 (2.5)	504 (2.5)	-1 (1.0)	503 (2.8)	-2 (1.5)	509 (3.1)	4 (1.5) ▲
Croatia	502 (1.8)	498 (1.8)	-4 (1.1) ▼	512 (2.3)	10 (1.5) ▲	498 (3.0)	-4 (2.1)
Slovak Republic	498 (2.5)	502 (2.4)	4 (1.6) ▲	491 (2.6)	-7 (1.2) ▼	496 (3.8)	-2 (2.6)
New Zealand	491 (2.3)	485 (2.7)	-5 (1.0) ▼	489 (2.8)	-2 (1.9)	506 (2.9)	16 (2.0) ▲
France	488 (2.9)	483 (3.0)	-5 (1.7) ▼	503 (3.0)	15 (2.0) ▲	476 (3.1)	-12 (1.7) ▼
Turkey	483 (3.1)	489 (3.2)	6 (1.2) ▲	475 (3.0)	-8 (0.9) ▼	476 (3.4)	-7 (1.3) ▼
1 Georgia	463 (3.6)	483 (3.5)	20 (1.1) ▲	429 (4.6)	-35 (2.2) ▼	435 (4.4)	-28 (1.9) ▼
Chile	459 (2.4)	455 (2.7)	-4 (1.2) ▼	460 (3.1)	1 (1.8)	463 (3.2)	5 (2.2) ▲
United Arab Emirates	452 (2.4)	455 (2.4)	3 (0.8) ▲	442 (2.7)	-10 (0.8) ▼	453 (2.4)	2 (0.9) ▲
2 Bahrain	451 (1.6)	453 (1.7)	2 (0.9) ▲	447 (1.9)	-4 (1.1) ▼	454 (2.3)	3 (1.8)
Qatar	439 (3.4)	446 (3.4)	7 (1.6) ▲	423 (4.4)	-16 (2.1) ▼	435 (3.9)	-4 (1.7) ▼
Iran, Islamic Rep. of	431 (3.2)	435 (3.2)	4 (1.3) ▲	428 (3.5)	-4 (1.6) ▼	416 (3.2)	-16 (1.8) ▼
Oman	425 (2.5)	423 (2.6)	-3 (1.0) ▼	430 (2.9)	5 (1.9) ▲	414 (2.6)	-12 (1.5) ▼
Indonesia	397 (3.7)	399 (3.6)	2 (0.9)	394 (4.2)	-3 (1.8)	385 (4.2)	-12 (1.9) ▼
Jordan	388 (3.1)	388 (3.1)	-1 (1.1)	394 (3.1)	6 (1.0) ▲	381 (3.4)	-7 (1.5) ▼
ψ Saudi Arabia	383 (4.1)	384 (4.1)	0 (1.8)	381 (5.0)	-2 (3.1)	365 (4.2)	-18 (2.5) ▼
Morocco	377 (3.4)	381 (3.3)	3 (0.9) ▲	385 (3.8)	8 (1.7) ▲	351 (4.2)	-27 (1.4) ▼
South Africa (5)	376 (3.5)	379 (3.4)	3 (0.9) ▲	359 (3.7)	-16 (1.1) ▼	381 (4.0)	5 (1.8) ▲
ψ Kuwait	353 (4.6)	356 (4.6)	3 (1.2) ▲	338 (4.9)	-15 (1.4) ▼	345 (5.4)	-8 (2.4) ▼

▲ Subscale score significantly higher than overall mathematics score

▼ Subscale score significantly lower than overall mathematics score

Numbers of items are based on the TIMSS 2015 fourth grade mathematics assessment items included in scaling.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.1: Achievement in Mathematics Content Domains (Continued)

Country	Overall Mathematics Average Scale Score	Number (89 items)		Geometric Shapes and Measures (56 items)		Data Display (24 items)	
		Average Scale Score	Difference from Overall Mathematics Score	Average Scale Score	Difference from Overall Mathematics Score	Average Scale Score	Difference from Overall Mathematics Score
Benchmarking Participants							
[1] Florida, US	546 (4.7)	556 (4.9)	10 (1.9) ▲	529 (5.6)	-17 (3.2) ▼	541 (6.1)	-5 (4.3)
‡ Quebec, Canada	536 (4.0)	533 (4.2)	-3 (1.5)	542 (4.6)	7 (1.8) ▲	541 (5.0)	5 (3.1)
Ontario, Canada	512 (2.3)	500 (2.6)	-13 (1.3) ▼	526 (2.9)	14 (1.6) ▲	536 (2.6)	23 (1.4) ▲
Dubai, UAE	511 (1.4)	514 (1.5)	3 (1.2) ▲	503 (1.9)	-8 (1.2) ▼	517 (1.7)	6 (1.0) ▲
Norway (4)	493 (2.3)	489 (2.2)	-4 (1.6) ▼	499 (2.7)	6 (1.9) ▲	495 (2.9)	2 (2.2)
Buenos Aires, Argentina	432 (2.9)	445 (2.9)	13 (1.0) ▲	403 (3.2)	-29 (1.6) ▼	411 (3.4)	-21 (1.3) ▼
[2] ψ Abu Dhabi, UAE	419 (4.7)	422 (4.7)	2 (1.6)	412 (5.1)	-8 (1.5) ▼	423 (4.8)	4 (1.7) ▲

▲ Subscale score significantly higher than overall mathematics score

▼ Subscale score significantly lower than overall mathematics score

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.2: Achievement in Mathematics Content Domains

Country	Overall Mathematics Average Scale Score	Number (64 items)			Algebra (61 items)		
		Average Scale Score	Difference from Overall Mathematics Score		Average Scale Score	Difference from Overall Mathematics Score	
[2] Singapore	621 (3.2)	629 (3.2)	8 (1.3)	▲	623 (3.4)	2 (1.2)	
Korea, Rep. of	606 (2.6)	601 (2.4)	-5 (1.1)	▼	612 (2.9)	6 (1.2)	▲
Chinese Taipei	599 (2.4)	590 (2.4)	-9 (1.0)	▼	613 (2.8)	14 (1.0)	▲
Hong Kong SAR	594 (4.6)	594 (4.9)	0 (1.9)		593 (4.7)	-1 (1.3)	
Japan	586 (2.3)	572 (2.4)	-14 (1.3)	▼	596 (2.8)	9 (1.5)	▲
Russian Federation	538 (4.7)	533 (4.5)	-5 (1.1)	▼	558 (5.2)	20 (1.3)	▲
Kazakhstan	528 (5.3)	516 (5.1)	-11 (1.5)	▼	555 (5.6)	27 (1.4)	▲
[1] † Canada	527 (2.2)	537 (2.4)	10 (0.7)	▲	513 (2.2)	-14 (0.6)	▼
Ireland	523 (2.7)	544 (3.3)	21 (1.7)	▲	501 (2.8)	-22 (1.1)	▼
† United States	518 (3.1)	520 (3.1)	1 (0.7)	▲	525 (3.1)	7 (0.9)	▲
England	518 (4.2)	528 (4.5)	9 (1.4)	▲	492 (4.7)	-26 (1.6)	▼
Slovenia	516 (2.1)	524 (2.4)	7 (1.3)	▲	498 (2.5)	-18 (1.5)	▼
Hungary	514 (3.8)	518 (4.0)	3 (1.1)	▲	503 (4.1)	-12 (1.6)	▼
Norway (9)	512 (2.3)	529 (2.6)	17 (1.1)	▲	471 (2.7)	-40 (1.3)	▼
[2] Lithuania	511 (2.8)	511 (2.8)	0 (1.4)		497 (3.3)	-14 (1.2)	▼
[3] Israel	511 (4.1)	518 (4.0)	7 (1.6)	▲	517 (4.7)	6 (1.7)	▲
Australia	505 (3.1)	511 (3.2)	6 (0.7)	▲	491 (3.4)	-14 (1.3)	▼
Sweden	501 (2.8)	513 (2.9)	12 (1.6)	▲	482 (3.2)	-19 (1.2)	▼
[2] Italy	494 (2.5)	494 (2.7)	0 (1.3)		481 (3.0)	-13 (1.8)	▼
Malta	494 (1.0)	501 (1.6)	7 (1.7)	▲	492 (1.8)	-1 (1.4)	
† New Zealand	493 (3.4)	500 (3.5)	7 (1.5)	▲	475 (3.5)	-18 (1.3)	▼
Malaysia	465 (3.6)	472 (3.6)	6 (0.7)	▲	467 (3.4)	2 (1.2)	
United Arab Emirates	465 (2.0)	464 (1.9)	-1 (0.9)		485 (2.0)	20 (0.7)	▲
Turkey	458 (4.7)	447 (4.6)	-10 (1.5)	▼	459 (4.6)	1 (1.5)	
Bahrain	454 (1.4)	436 (2.0)	-18 (1.5)	▼	483 (2.1)	29 (2.0)	▲
[1] [2] Georgia	453 (3.4)	457 (3.4)	4 (1.3)	▲	469 (3.8)	16 (1.4)	▲
Lebanon	442 (3.6)	440 (4.1)	-2 (2.2)		466 (4.0)	23 (2.0)	▲
ψ Qatar	437 (3.0)	435 (2.9)	-2 (1.6)		452 (2.6)	15 (2.0)	▲
ψ Iran, Islamic Rep. of	436 (4.6)	432 (4.7)	-5 (1.7)	▼	437 (5.1)	1 (2.8)	
Thailand	431 (4.8)	430 (5.0)	-1 (1.6)		429 (5.1)	-2 (1.5)	
ψ Chile	427 (3.2)	427 (3.3)	0 (1.1)		413 (3.4)	-14 (1.3)	▼
ψ Oman	403 (2.4)	389 (2.6)	-14 (2.1)	▼	426 (2.7)	23 (1.3)	▲
ψ Kuwait	392 (4.6)	395 (4.8)	2 (1.9)		384 (4.8)	-8 (2.4)	▼
ψ Egypt	392 (4.1)	393 (3.7)	1 (1.8)		420 (4.3)	27 (1.0)	▲
ψ Botswana (9)	391 (2.0)	393 (3.2)	3 (2.0)		400 (2.3)	9 (1.2)	▲
ж Jordan	386 (3.2)	380 (3.2)	-5 (1.3)	▼	418 (3.5)	32 (1.3)	▲
ж Morocco	384 (2.3)	382 (2.1)	-2 (1.1)		372 (2.3)	-12 (1.0)	▼
ж South Africa (9)	372 (4.5)	368 (4.7)	-4 (0.9)	▼	394 (4.3)	21 (1.1)	▲
ж Saudi Arabia	368 (4.6)	352 (4.5)	-16 (2.1)	▼	391 (4.4)	23 (1.7)	▲
Benchmarking Participants							
‡ Quebec, Canada	543 (3.9)	557 (4.3)	14 (1.4)	▲	530 (4.4)	-13 (2.6)	▼
Ontario, Canada	522 (2.9)	530 (3.0)	7 (0.8)	▲	507 (3.0)	-15 (1.4)	▼
Dubai, UAE	512 (2.1)	509 (2.5)	-3 (1.5)	▼	528 (2.7)	17 (1.8)	▲
[1] Florida, US	493 (6.4)	498 (6.6)	5 (1.6)	▲	502 (6.8)	9 (1.4)	▲
Norway (8)	487 (2.0)	504 (2.2)	17 (1.2)	▲	423 (2.7)	-63 (1.6)	▼
Abu Dhabi, UAE	442 (4.7)	443 (4.4)	1 (1.7)		462 (4.5)	20 (1.5)	▲
† ж Buenos Aires, Argentina	396 (4.2)	415 (4.2)	19 (1.9)	▲	371 (5.1)	-25 (2.0)	▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

▲ Subscale score significantly higher than overall mathematics score

▼ Subscale score significantly lower than overall mathematics score

Numbers of items are based on the TIMSS 2015 eighth grade mathematics assessment items included in scaling.

ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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Exhibit 3.2: Achievement in Mathematics Content Domains (Continued)

Country	Geometry (43 items)			Data and Chance (41 items)		
	Average Scale Score	Difference from Overall Mathematics Score		Average Scale Score	Difference from Overall Mathematics Score	
[2] Singapore	617 (3.5)	-4 (1.4)	▼	617 (3.4)	-4 (0.8)	▼
Korea, Rep. of	612 (3.4)	6 (2.0)	▲	600 (2.4)	-6 (1.4)	▼
Chinese Taipei	607 (2.6)	8 (1.6)	▲	588 (2.5)	-11 (1.0)	▼
Hong Kong SAR	602 (5.1)	8 (1.6)	▲	597 (5.9)	3 (2.9)	
Japan	598 (2.6)	11 (1.1)	▲	589 (2.3)	3 (1.2)	▲
Russian Federation	536 (5.6)	-2 (1.8)		507 (5.0)	-31 (2.2)	▼
Kazakhstan	529 (6.4)	1 (1.7)		492 (5.5)	-36 (1.9)	▼
[1] † Canada	527 (2.5)	-1 (1.0)		534 (2.9)	7 (1.6)	▲
Ireland	503 (3.1)	-20 (1.4)	▼	534 (3.8)	10 (2.3)	▲
† United States	500 (3.2)	-18 (1.0)	▼	522 (3.5)	4 (0.8)	▲
England	514 (4.1)	-4 (1.4)	▼	541 (4.7)	23 (2.3)	▲
Slovenia	522 (2.8)	6 (1.9)	▲	525 (2.7)	8 (1.4)	▲
Hungary	518 (4.2)	4 (1.4)	▲	519 (3.9)	4 (1.2)	▲
Norway (9)	498 (2.5)	-14 (1.2)	▼	542 (3.2)	31 (2.1)	▲
[2] Lithuania	515 (3.1)	3 (1.2)	▲	521 (2.7)	10 (1.4)	▲
[3] Israel	487 (4.6)	-24 (1.5)	▼	503 (4.9)	-8 (2.5)	▼
Australia	500 (3.1)	-5 (1.1)	▼	519 (3.1)	14 (1.2)	▲
Sweden	478 (3.4)	-23 (2.3)	▼	512 (3.7)	11 (2.1)	▲
[2] Italy	504 (3.5)	10 (2.2)	▲	496 (2.7)	2 (1.3)	
Malta	484 (1.7)	-10 (1.4)	▼	487 (2.6)	-7 (2.3)	▼
† New Zealand	488 (3.2)	-5 (1.5)	▼	509 (3.7)	16 (1.8)	▲
Malaysia	455 (3.9)	-10 (1.0)	▼	451 (3.8)	-14 (1.0)	▼
United Arab Emirates	447 (2.4)	-17 (1.0)	▼	449 (2.5)	-16 (1.1)	▼
Turkey	463 (4.9)	5 (2.0)	▲	467 (5.2)	9 (2.0)	▲
Bahrain	449 (2.5)	-5 (2.1)	▼	453 (2.2)	-1 (1.8)	
[1] [2] Georgia	441 (3.9)	-13 (1.7)	▼	421 (3.7)	-32 (1.5)	▼
Lebanon	444 (4.0)	1 (2.3)		395 (4.6)	-47 (2.6)	▼
ψ Qatar	433 (3.0)	-4 (2.3)		417 (3.9)	-20 (1.7)	▼
ψ Iran, Islamic Rep. of	448 (4.7)	11 (2.4)	▲	417 (5.0)	-19 (1.7)	▼
Thailand	429 (4.9)	-2 (1.5)		425 (4.6)	-7 (1.5)	▼
ψ Chile	428 (3.4)	0 (2.8)		429 (3.8)	2 (1.7)	
ψ Oman	415 (2.8)	11 (1.7)	▲	376 (3.0)	-27 (1.7)	▼
ψ Kuwait	382 (5.3)	-11 (2.9)	▼	377 (5.0)	-15 (3.3)	▼
ψ Egypt	393 (4.1)	1 (1.2)		338 (4.4)	-54 (1.4)	▼
ψ Botswana (9)	377 (2.5)	-14 (1.8)	▼	374 (3.1)	-17 (2.3)	▼
ж Jordan	381 (3.4)	-5 (2.0)	▼	346 (4.0)	-39 (2.3)	▼
ж Morocco	410 (3.0)	26 (2.0)	▲	353 (2.9)	-31 (2.0)	▼
ж South Africa (9)	364 (4.5)	-9 (1.1)	▼	357 (4.9)	-15 (1.8)	▼
ж Saudi Arabia	342 (5.3)	-25 (2.9)	▼	361 (4.9)	-6 (2.9)	▼
Benchmarking Participants						
‡ Quebec, Canada	540 (4.3)	-3 (1.1)	▼	546 (5.0)	3 (2.0)	
Ontario, Canada	524 (3.5)	2 (1.6)		531 (3.9)	9 (2.5)	▲
Dubai, UAE	496 (2.6)	-16 (1.8)	▼	504 (3.0)	-8 (2.1)	▼
[1] Florida, US	470 (6.5)	-24 (2.6)	▼	489 (8.1)	-4 (4.0)	
Norway (8)	477 (2.4)	-9 (1.2)	▼	519 (3.0)	33 (2.0)	▲
Abu Dhabi, UAE	425 (5.4)	-16 (1.7)	▼	426 (5.5)	-16 (2.6)	▼
† ж Buenos Aires, Argentina	358 (5.0)	-38 (2.2)	▼	373 (5.3)	-23 (2.2)	▼

▲ Subscale score significantly higher than overall mathematics score

▼ Subscale score significantly lower than overall mathematics score

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.3: Achievement in Mathematics Cognitive Domains

Country	Overall Mathematics Average Scale Score	Knowing (64 items)		Applying (72 items)		Reasoning (33 items)	
		Average Scale Score	Difference from Overall Mathematics Score	Average Scale Score	Difference from Overall Mathematics Score	Average Scale Score	Difference from Overall Mathematics Score
[2] Singapore	618 (3.8)	631 (4.0)	13 (1.4) ▲	619 (4.0)	2 (1.0)	603 (4.5)	-15 (1.4) ▼
† Hong Kong SAR	615 (2.9)	618 (3.1)	4 (1.3) ▲	621 (3.1)	6 (1.3) ▲	600 (3.2)	-15 (1.5) ▼
Korea, Rep. of	608 (2.2)	627 (2.9)	19 (1.4) ▲	595 (2.1)	-13 (1.2) ▼	619 (2.5)	11 (2.0) ▲
Chinese Taipei	597 (1.9)	620 (2.3)	24 (1.9) ▲	593 (2.1)	-3 (1.5) ▼	576 (3.1)	-21 (2.0) ▼
Japan	593 (2.0)	601 (2.4)	9 (1.3) ▲	589 (2.1)	-4 (1.2) ▼	595 (2.7)	2 (1.9)
‡ Northern Ireland	570 (2.9)	582 (3.9)	11 (1.6) ▲	575 (3.2)	5 (1.2) ▲	550 (3.3)	-21 (1.9) ▼
Russian Federation	564 (3.4)	556 (3.4)	-7 (1.0) ▼	566 (3.7)	3 (1.7)	570 (4.0)	6 (1.8) ▲
Norway (5)	549 (2.5)	544 (3.1)	-5 (1.9) ▼	550 (2.6)	1 (1.1)	556 (2.9)	7 (2.2) ▲
Ireland	547 (2.1)	554 (2.9)	7 (2.2) ▲	549 (2.2)	1 (1.2)	535 (2.7)	-12 (1.7) ▼
England	546 (2.8)	554 (3.3)	8 (1.5) ▲	544 (3.2)	-2 (1.7)	540 (3.2)	-6 (2.0) ▼
† Belgium (Flemish)	546 (2.1)	554 (2.3)	8 (0.8) ▲	544 (2.2)	-2 (1.1)	536 (2.7)	-10 (1.4) ▼
Kazakhstan	544 (4.5)	546 (4.4)	1 (1.3)	541 (4.9)	-4 (1.3) ▼	553 (4.6)	9 (1.6) ▲
[2] Portugal	541 (2.2)	548 (2.6)	6 (1.9) ▲	540 (2.4)	-2 (1.2)	532 (2.3)	-10 (1.3) ▼
[2] † United States	539 (2.3)	547 (2.3)	8 (1.2) ▲	537 (2.4)	-2 (1.0)	531 (2.5)	-9 (1.3) ▼
[2] † Denmark	539 (2.7)	536 (3.3)	-3 (1.6)	538 (2.8)	-1 (1.7)	548 (3.2)	9 (2.0) ▲
[2] Lithuania	535 (2.5)	532 (2.5)	-3 (1.1) ▼	537 (2.7)	1 (1.3)	534 (2.8)	-1 (1.4)
Finland	535 (2.0)	530 (2.2)	-5 (1.4) ▼	536 (2.1)	1 (1.0)	540 (3.1)	5 (2.2) ▲
Poland	535 (2.1)	517 (2.4)	-18 (1.0) ▼	541 (2.1)	6 (0.7) ▲	546 (2.3)	11 (1.3) ▲
† Netherlands	530 (1.7)	521 (1.8)	-9 (0.8) ▼	531 (1.7)	1 (1.4)	543 (2.6)	13 (2.4) ▲
Hungary	529 (3.2)	532 (3.1)	3 (1.2) ▲	526 (3.3)	-3 (1.0) ▼	529 (3.6)	0 (1.5)
Czech Republic	528 (2.2)	519 (2.5)	-9 (1.2) ▼	528 (2.4)	0 (0.9)	544 (3.0)	16 (1.9) ▲
Bulgaria	524 (5.3)	527 (5.1)	3 (1.7)	523 (5.6)	-2 (1.8)	521 (5.8)	-4 (1.8) ▼
Cyprus	523 (2.7)	519 (2.8)	-4 (1.7) ▼	529 (2.8)	6 (1.6) ▲	519 (3.1)	-4 (1.6) ▼
Germany	522 (2.0)	524 (2.3)	2 (0.9) ▲	515 (2.2)	-6 (1.2) ▼	535 (2.4)	13 (1.6) ▲
Slovenia	520 (1.9)	517 (1.9)	-3 (1.2) ▼	521 (2.1)	1 (0.8)	524 (2.2)	4 (1.2) ▲
[2] Sweden	519 (2.8)	501 (3.4)	-18 (1.8) ▼	521 (2.7)	3 (0.9) ▲	542 (3.3)	23 (1.5) ▲
[3] Serbia	518 (3.5)	513 (3.5)	-5 (1.7) ▼	521 (3.4)	3 (1.4) ▲	517 (3.8)	-1 (1.8)
Australia	517 (3.1)	509 (3.5)	-8 (1.6) ▼	521 (3.0)	4 (1.2) ▲	523 (3.0)	6 (1.7) ▲
[1 2] † Canada	511 (2.3)	505 (2.4)	-5 (0.7) ▼	510 (2.3)	0 (0.6)	521 (2.4)	10 (0.7) ▲
[2] Italy	507 (2.6)	511 (2.9)	4 (1.0) ▲	504 (2.5)	-3 (1.7)	503 (3.3)	-4 (3.0)
[2] Spain	505 (2.5)	505 (2.4)	0 (1.2)	505 (2.4)	0 (0.9)	502 (2.5)	-3 (0.9) ▼
Croatia	502 (1.8)	502 (1.9)	0 (1.2)	499 (1.9)	-4 (1.2) ▼	507 (2.1)	5 (1.1) ▲
Slovak Republic	498 (2.5)	491 (2.4)	-8 (1.3) ▼	497 (2.5)	-2 (1.0)	515 (2.9)	17 (1.8) ▲
New Zealand	491 (2.3)	475 (2.6)	-15 (1.3) ▼	497 (2.5)	6 (1.5) ▲	504 (2.7)	13 (1.3) ▲
France	488 (2.9)	484 (2.8)	-4 (0.9) ▼	488 (3.1)	0 (1.0)	491 (3.4)	3 (2.2)
Turkey	483 (3.1)	491 (3.4)	8 (1.5) ▲	482 (3.5)	-1 (2.0)	466 (3.5)	-17 (2.0) ▼
[1] Georgia	463 (3.6)	466 (4.0)	3 (1.8)	461 (4.1)	-2 (2.4)	452 (4.4)	-11 (2.1) ▼
Chile	459 (2.4)	449 (2.8)	-10 (1.8) ▼	462 (2.4)	4 (1.2) ▲	466 (2.3)	7 (1.2) ▲
United Arab Emirates	452 (2.4)	453 (2.7)	1 (1.0)	452 (2.5)	1 (0.7)	445 (2.4)	-6 (1.0) ▼
[2] Bahrain	451 (1.6)	453 (1.8)	2 (1.2)	450 (1.6)	-1 (0.9)	447 (2.0)	-4 (1.4) ▼
Qatar	439 (3.4)	444 (3.4)	5 (1.2) ▲	434 (3.5)	-5 (1.0) ▼	431 (4.4)	-8 (3.0) ▼
Iran, Islamic Rep. of	431 (3.2)	429 (3.2)	-3 (1.7)	435 (2.9)	3 (1.4) ▲	426 (3.3)	-5 (1.8) ▼
Oman	425 (2.5)	422 (2.7)	-3 (1.0) ▼	428 (2.4)	2 (1.2) ▲	420 (2.4)	-6 (1.1) ▼
Indonesia	397 (3.7)	395 (4.2)	-3 (1.8)	397 (3.6)	0 (1.0)	397 (3.5)	-1 (1.2)
Jordan	388 (3.1)	389 (3.1)	1 (0.9)	388 (3.1)	0 (1.1)	385 (3.3)	-3 (1.9)
ψ Saudi Arabia	383 (4.1)	374 (4.6)	-10 (2.0) ▼	382 (4.5)	-2 (2.1)	383 (4.3)	-1 (2.4)
Morocco	377 (3.4)	377 (3.7)	-1 (1.2)	375 (3.6)	-3 (0.9) ▼	379 (3.6)	2 (1.7)
South Africa (5)	376 (3.5)	378 (3.6)	2 (0.6) ▲	377 (3.4)	1 (0.7)	369 (3.5)	-7 (0.9) ▼
ψ Kuwait	353 (4.6)	354 (4.5)	1 (1.6)	348 (4.8)	-5 (1.7) ▼	332 (5.0)	-21 (1.5) ▼

▲ Subscale score significantly higher than overall mathematics score

▼ Subscale score significantly lower than overall mathematics score

Numbers of items are based on the TIMSS 2015 fourth grade mathematics assessment items included in scaling.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.3: Achievement in Mathematics Cognitive Domains (Continued)

Country	Overall Mathematics Average Scale Score	Knowing (64 items)		Applying (72 items)		Reasoning (33 items)	
		Average Scale Score	Difference from Overall Mathematics Score	Average Scale Score	Difference from Overall Mathematics Score	Average Scale Score	Difference from Overall Mathematics Score
Benchmarking Participants							
[1] Florida, US	546 (4.7)	555 (5.2)	9 (2.8) ▲	545 (4.9)	-2 (1.6)	534 (6.2)	-12 (3.7) ▼
‡ Quebec, Canada	536 (4.0)	542 (4.3)	6 (1.9) ▲	533 (4.1)	-3 (1.3) ▼	536 (4.9)	1 (2.3)
Ontario, Canada	512 (2.3)	505 (2.5)	-8 (1.0) ▼	513 (2.3)	1 (0.8)	524 (2.6)	12 (1.0) ▲
Dubai, UAE	511 (1.4)	514 (2.0)	3 (1.6)	510 (1.8)	0 (1.5)	507 (1.7)	-4 (1.1) ▼
Norway (4)	493 (2.3)	479 (2.6)	-14 (1.3) ▼	495 (2.5)	2 (1.9)	506 (3.0)	13 (2.0) ▲
Buenos Aires, Argentina	432 (2.9)	432 (2.9)	0 (1.3)	427 (3.0)	-5 (0.9) ▼	437 (3.4)	5 (1.8) ▲
[2] ψ Abu Dhabi, UAE	419 (4.7)	418 (5.1)	-1 (1.3)	422 (4.8)	2 (1.8)	414 (4.4)	-6 (1.4) ▼

▲ Subscale score significantly higher than overall mathematics score

▼ Subscale score significantly lower than overall mathematics score

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.4: Achievement in Mathematics Cognitive Domains

Country	Overall Mathematics Average Scale Score	Knowing (69 items)			Applying (94 items)			Reasoning (46 items)		
		Average Scale Score	Difference from Overall Mathematics Score		Average Scale Score	Difference from Overall Mathematics Score		Average Scale Score	Difference from Overall Mathematics Score	
[2] Singapore	621 (3.2)	633 (3.4)	12 (0.7)	▲	619 (3.2)	-2 (1.6)		616 (3.7)	-5 (1.6)	▼
Korea, Rep. of	606 (2.6)	607 (2.8)	1 (1.2)		606 (2.8)	0 (1.1)		608 (2.7)	2 (1.3)	
Chinese Taipei	599 (2.4)	598 (2.9)	-1 (1.2)		602 (2.5)	3 (0.7)	▲	602 (2.5)	3 (1.1)	▲
Hong Kong SAR	594 (4.6)	600 (5.1)	5 (2.1)	▲	595 (4.5)	1 (1.1)		591 (5.1)	-3 (1.4)	▼
Japan	586 (2.3)	578 (2.6)	-9 (1.2)	▼	592 (2.3)	5 (0.8)	▲	591 (2.6)	4 (1.5)	▲
Russian Federation	538 (4.7)	543 (5.6)	5 (1.4)	▲	541 (4.6)	3 (0.8)	▲	528 (5.0)	-10 (1.2)	▼
Kazakhstan	528 (5.3)	533 (6.3)	5 (2.0)	▲	527 (5.4)	-1 (1.1)		525 (5.5)	-3 (1.5)	▼
[1] † Canada	527 (2.2)	520 (2.3)	-7 (0.9)	▼	528 (2.2)	1 (0.7)		534 (2.4)	7 (1.0)	▲
Ireland	523 (2.7)	527 (3.0)	4 (1.8)	▲	520 (3.0)	-3 (1.1)	▼	521 (3.1)	-2 (1.9)	
† United States	518 (3.1)	528 (3.5)	10 (1.2)	▲	515 (3.2)	-4 (0.6)	▼	514 (3.1)	-4 (0.8)	▼
England	518 (4.2)	513 (4.1)	-5 (0.9)	▼	519 (4.1)	1 (1.0)		522 (4.4)	4 (1.9)	▲
Slovenia	516 (2.1)	518 (2.4)	2 (1.3)		514 (2.1)	-2 (0.8)	▼	516 (2.7)	0 (1.5)	
Hungary	514 (3.8)	511 (3.9)	-3 (1.3)	▼	516 (3.8)	2 (1.1)		515 (3.9)	1 (1.4)	
Norway (9)	512 (2.3)	500 (2.3)	-11 (1.2)	▼	516 (2.3)	5 (1.1)	▲	516 (2.5)	4 (1.5)	▲
[2] Lithuania	511 (2.8)	502 (3.1)	-9 (2.0)	▼	520 (2.6)	9 (1.0)	▲	501 (3.0)	-10 (1.5)	▼
[3] Israel	511 (4.1)	511 (4.2)	0 (1.2)		512 (4.0)	1 (0.8)		510 (4.4)	-1 (1.5)	
Australia	505 (3.1)	504 (3.1)	-1 (1.5)		502 (3.0)	-3 (1.0)	▼	512 (3.1)	7 (1.2)	▲
Sweden	501 (2.8)	484 (2.8)	-16 (1.0)	▼	507 (2.8)	6 (1.2)	▲	509 (3.5)	9 (2.3)	▲
[2] Italy	494 (2.5)	489 (2.7)	-6 (1.4)	▼	495 (2.6)	1 (1.2)		500 (2.8)	6 (1.2)	▲
Malta	494 (1.0)	499 (1.5)	5 (1.0)	▲	493 (1.5)	0 (1.4)		484 (2.2)	-9 (1.9)	▼
† New Zealand	493 (3.4)	488 (3.4)	-5 (1.1)	▼	493 (3.3)	0 (1.3)		499 (3.5)	6 (1.6)	▲
Malaysia	465 (3.6)	472 (3.8)	7 (0.7)	▲	463 (3.6)	-2 (1.0)	▼	453 (3.7)	-12 (1.3)	▼
United Arab Emirates	465 (2.0)	476 (2.2)	11 (1.0)	▲	457 (2.1)	-7 (0.9)	▼	461 (2.2)	-4 (1.1)	▼
Turkey	458 (4.7)	447 (4.9)	-11 (1.6)	▼	460 (4.3)	2 (1.4)		472 (4.8)	15 (1.5)	▲
Bahrain	454 (1.4)	463 (2.3)	9 (2.0)	▲	445 (1.7)	-9 (1.2)	▼	452 (2.2)	-2 (2.0)	
[1] [2] Georgia	453 (3.4)	456 (4.1)	3 (1.8)		454 (3.6)	1 (1.5)		441 (4.5)	-13 (2.1)	▼
Lebanon	442 (3.6)	456 (3.8)	13 (1.3)	▲	439 (3.9)	-4 (1.4)	▼	406 (4.5)	-37 (2.1)	▼
ψ Qatar	437 (3.0)	440 (3.1)	3 (1.8)		435 (2.9)	-2 (2.0)		431 (2.8)	-6 (2.0)	▼
ψ Iran, Islamic Rep. of	436 (4.6)	435 (4.9)	-1 (2.2)		434 (4.4)	-2 (1.8)		436 (4.7)	0 (1.8)	
Thailand	431 (4.8)	425 (5.1)	-6 (1.2)	▼	431 (4.7)	0 (1.5)		435 (4.8)	4 (1.7)	▲
ψ Chile	427 (3.2)	423 (3.4)	-5 (2.3)	▼	427 (3.3)	-1 (2.4)		432 (3.3)	4 (2.3)	
ψ Oman	403 (2.4)	401 (3.1)	-2 (1.9)		401 (2.5)	-2 (1.2)	▼	402 (3.1)	-1 (1.8)	
ψ Kuwait	392 (4.6)	398 (4.7)	5 (2.0)	▲	389 (4.5)	-3 (2.3)		374 (4.5)	-19 (2.1)	▼
ψ Egypt	392 (4.1)	399 (4.3)	7 (1.2)	▲	385 (3.9)	-7 (1.0)	▼	379 (4.3)	-13 (1.8)	▼
ψ Botswana (9)	391 (2.0)	394 (3.0)	3 (1.9)		385 (2.3)	-5 (1.3)	▼	389 (2.0)	-2 (1.0)	
ж Jordan	386 (3.2)	391 (3.2)	5 (1.4)	▲	378 (3.2)	-7 (1.2)	▼	380 (3.3)	-6 (1.9)	▼
ж Morocco	384 (2.3)	382 (2.4)	-2 (1.9)		385 (2.2)	1 (1.5)		374 (2.8)	-10 (1.9)	▼
ж South Africa (9)	372 (4.5)	371 (5.2)	-1 (1.1)		362 (4.6)	-10 (1.3)	▼	383 (4.2)	11 (1.4)	▲
ж Saudi Arabia	368 (4.6)	359 (4.9)	-8 (1.6)	▼	364 (4.2)	-4 (2.4)		374 (4.0)	6 (2.0)	▲
Benchmarking Participants										
‡ Quebec, Canada	543 (3.9)	541 (4.2)	-3 (1.8)		546 (4.0)	3 (1.4)	▲	538 (4.2)	-5 (2.1)	▼
Ontario, Canada	522 (2.9)	513 (3.0)	-9 (1.3)	▼	522 (2.8)	0 (1.3)		534 (3.1)	12 (1.2)	▲
Dubai, UAE	512 (2.1)	521 (2.3)	9 (1.3)	▲	505 (2.5)	-7 (1.3)	▼	509 (2.8)	-2 (2.0)	
[1] Florida, US	493 (6.4)	501 (7.3)	8 (2.9)	▲	488 (6.7)	-5 (1.7)	▼	491 (6.6)	-3 (2.8)	
Norway (8)	487 (2.0)	476 (2.6)	-10 (2.2)	▼	492 (2.3)	5 (1.7)	▲	488 (2.3)	1 (1.4)	
Abu Dhabi, UAE	442 (4.7)	453 (4.8)	12 (1.6)	▲	434 (4.7)	-8 (1.1)	▼	440 (4.7)	-2 (1.4)	
† ж Buenos Aires, Argentina	396 (4.2)	397 (4.4)	1 (1.6)		392 (4.8)	-4 (2.2)		383 (5.3)	-14 (2.3)	▼

▲ Subscale score significantly higher than overall mathematics score
▼ Subscale score significantly lower than overall mathematics score

Numbers of items are based on the TIMSS 2015 eighth grade mathematics assessment items included in scaling.

ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.5: Differences in Achievement for Mathematics Content Domains Across Assessment Years

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Number Average Scale Score	Number: Differences Between Years 2011	Number: Differences Between Years 2007	Geometric Shapes and Measures Average Scale Score	Geometric Shapes and Measures: Differences Between Years 2011	Geometric Shapes and Measures: Differences Between Years 2007	Data Display Average Scale Score	Data Display: Differences Between Years 2011	Data Display: Differences Between Years 2007
Australia									
2015	509 (3.1)	1	6	527 (3.3)	-7	-9	533 (3.6)	17 ▲	0
2011	508 (3.2)		5	534 (3.0)		-3	515 (3.1)		-17 ▼
2007	503 (3.6)			536 (3.6)			532 (4.3)		
Bahrain									
2 2015	453 (1.7)	14 ▲		447 (1.9)	25 ▲		454 (2.3)	12 ▲	
2011	439 (3.1)			422 (3.8)			442 (4.0)		
Belgium (Flemish)									
† 2015	543 (2.1)	-8 ▼		564 (2.3)	11 ▲		523 (3.0)	-13 ▼	
2011	552 (2.1)			552 (1.9)			536 (2.8)		
Chile									
2015	455 (2.7)	-7		460 (3.1)	4		463 (3.2)	-2	
2011	462 (2.7)			455 (3.0)			465 (2.6)		
Chinese Taipei									
2015	599 (1.8)	0	17 ▲	597 (3.0)	24 ▲	31 ▲	591 (2.2)	-9 ▼	15 ▲
2011	599 (2.0)		17 ▲	573 (2.1)		7 ▲	600 (2.6)		24 ▲
2007	583 (1.8)			566 (2.7)			576 (2.4)		
Croatia									
2015	498 (1.8)	7 ▲		512 (2.3)	22 ▲		498 (3.0)	10 ▲	
2 2011	491 (1.9)			490 (2.5)			488 (2.9)		
Czech Republic									
2015	528 (2.4)	19 ▲	42 ▲	531 (2.5)	18 ▲	44 ▲	525 (3.0)	6	43 ▲
2011	509 (2.5)		23 ▲	513 (3.0)		26 ▲	519 (2.9)		37 ▲
2007	486 (2.7)			487 (3.2)			482 (4.1)		
Denmark									
2 † 2015	535 (2.7)	1	21 ▲	555 (3.2)	7	10 ▲	526 (3.5)	-6	-1
2 2011	534 (2.5)		21 ▲	548 (3.1)		2	532 (2.9)		5
† 2007	513 (2.7)			546 (3.1)			527 (4.0)		
England									
2015	547 (3.2)	8	11 ▲	542 (3.3)	-3	-9 ▼	552 (3.2)	3	2
2011	539 (3.7)		4	545 (3.8)		-6	549 (4.6)		-1
2007	535 (3.2)			552 (3.3)			551 (3.3)		
Finland									
2015	532 (2.1)	-14 ▼		539 (2.5)	-4		542 (3.3)	-9	
2011	545 (2.4)			543 (3.0)			551 (3.7)		
Georgia									
1 2015	483 (3.5)	10 ▲	12 ▲	429 (4.6)	17 ▲	33 ▲	435 (4.4)	2	45 ▲
1 2011	473 (3.2)		2	411 (4.2)		16 ▲	433 (4.2)		43 ▲
1 2007	470 (3.7)			395 (5.9)			390 (5.4)		
Germany									
2015	515 (2.1)	-5	-9 ▼	531 (2.5)	-5	4	535 (2.6)	-11 ▼	3
2011	520 (2.3)		-4	536 (2.7)		9 ▲	546 (2.8)		14 ▲
2007	524 (2.2)			527 (2.4)			532 (3.7)		
Hong Kong SAR									
† 2015	616 (3.1)	12 ▲	9	617 (3.4)	12 ▲	3	611 (3.8)	18 ▲	10 ▲
2 2011	604 (3.3)		-4	605 (3.4)		-9	593 (3.7)		-7
2007	608 (3.7)			613 (3.8)			600 (3.3)		
Hungary									
2015	531 (3.0)	16 ▲	16 ▲	536 (3.6)	16 ▲	29 ▲	513 (3.6)	3	16 ▲
2011	515 (3.3)		0	520 (3.7)		14 ▲	510 (4.1)		13 ▲
2007	515 (3.4)			507 (3.9)			497 (4.3)		

▲ More recent year significantly higher

▼ More recent year significantly lower

Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish or in Russian.

⋇ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

⧓ Tested the same cohort of students as other countries, but later in the assessment year at the beginning of the next school year.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.5: Differences in Achievement for Mathematics Content Domains Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Number Average Scale Score	Number: Differences Between Years 2011	Number: Differences Between Years 2007	Geometric Shapes and Measures Average Scale Score	Geometric Shapes and Measures: Differences Between Years 2011	Geometric Shapes and Measures: Differences Between Years 2007	Data Display Average Scale Score	Data Display: Differences Between Years 2011	Data Display: Differences Between Years 2007
Iran, Islamic Rep. of									
2015	435 (3.2)	-5	28 ▲	428 (3.5)	-7	19 ▲	416 (3.2)	18 ▲	42 ▲
2011	440 (3.3)		32 ▲	435 (3.7)		26 ▲	397 (4.2)		24 ▲
2007	407 (3.5)			408 (4.0)			374 (5.1)		
Ireland									
2015	551 (2.2)	18 ▲		542 (2.9)	22 ▲		548 (3.8)	25 ▲	
2011	533 (2.6)			520 (3.1)			523 (3.0)		
Italy									
[2] 2015	510 (2.4)	0	0	503 (2.8)	-9 ▼	-3	498 (2.9)	3	-1
2011	510 (2.7)		0	513 (3.2)		6	495 (3.2)		-4
2007	510 (2.9)			507 (3.6)			499 (4.0)		
Japan									
2015	592 (1.9)	8 ▲	28 ▲	601 (2.5)	12 ▲	26 ▲	593 (2.6)	4	6
2011	584 (1.7)		20 ▲	589 (1.9)		14 ▲	590 (3.0)		2
2007	564 (2.1)			575 (2.7)			588 (3.5)		
Kazakhstan									
2015	552 (4.0)	37 ▲		540 (5.8)	48 ▲		524 (5.3)	48 ▲	
[2] 2011	515 (4.1)			491 (5.4)			476 (5.5)		
Korea, Rep. of									
2015	610 (2.6)	4		610 (2.3)	3		607 (2.6)	4	
2011	606 (2.0)			607 (2.0)			603 (1.8)		
Kuwait									
ψ 2015	329 (3.0)	-4		315 (3.8)	-6		321 (3.9)	-26 ▼	
[1] Ж 2011	333 (4.0)			321 (4.1)			347 (3.8)		
Lithuania									
[2] 2015	539 (2.8)	1	3	527 (3.2)	-4	9 ▲	542 (4.0)	16 ▲	13 ▲
[1] [2] 2011	537 (2.4)		1	531 (2.9)		12 ▲	526 (2.8)		-3
[1] 2007	536 (2.2)			518 (3.1)			529 (3.7)		
Morocco									
2015	381 (3.3)	41 ▲		385 (3.8)	35 ▲		351 (4.2)	80 ▲	
Ж 2011	340 (4.0)			350 (3.8)			271 (4.7)		
Netherlands									
† 2015	531 (2.2)	-12 ▼	-8 ▼	522 (1.9)	-2	0	539 (3.4)	-20 ▼	-6
† 2011	543 (1.7)		4	524 (2.9)		2	559 (2.8)		14 ▲
‡ 2007	539 (2.2)			522 (2.6)			545 (2.8)		
New Zealand									
2015	485 (2.7)	3	0	489 (2.8)	6	-7	506 (2.9)	15 ▲	0
2011	483 (2.7)		-3	483 (2.6)		-12 ▼	491 (2.8)		-15 ▼
2007	485 (2.6)			495 (2.5)			506 (3.0)		
Northern Ireland									
‡ 2015	574 (3.1)	8		566 (3.3)	6		567 (3.8)	12 ▲	
† 2011	566 (2.9)			560 (3.2)			555 (2.9)		
Norway (4)									
2015	489 (2.2)	1	21 ▲	499 (2.7)	-7	20 ▲	495 (2.9)	1	21 ▲
‡ 2011	488 (3.0)		20 ▲	507 (2.9)		27 ▲	494 (3.2)		20 ▲
2007	468 (2.8)			479 (3.5)			474 (2.9)		
Oman									
2015	423 (2.6)	39 ▲		430 (2.9)	54 ▲		414 (2.6)	33 ▲	
ψ 2011	384 (3.1)			376 (3.2)			381 (3.0)		
Portugal									
[2] 2015	541 (2.1)	18 ▲		539 (2.6)	-9		546 (2.8)	-2	
2011	522 (3.6)			548 (4.0)			548 (2.9)		
Qatar									
2015	446 (3.4)	29 ▲		423 (4.4)	24 ▲		435 (3.9)	19 ▲	
[2] 2011	417 (3.4)			399 (4.0)			416 (4.7)		

▲ More recent year significantly higher
▼ More recent year significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.5: Differences in Achievement for Mathematics Content Domains Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Number Average Scale Score	Number: Differences Between Years 2011	Number: Differences Between Years 2007	Geometric Shapes and Measures Average Scale Score	Geometric Shapes and Measures: Differences Between Years 2011	Geometric Shapes and Measures: Differences Between Years 2007	Data Display Average Scale Score	Data Display: Differences Between Years 2011	Data Display: Differences Between Years 2007
Russian Federation									
2015	567 (3.3)	22 ▲	18 ▲	557 (4.4)	15 ▲	14	573 (3.6)	40 ▲	44 ▲
2011	545 (3.3)		-4	542 (4.2)		-1	533 (4.0)		4
2007	549 (4.4)			543 (6.2)			529 (6.2)		
Saudi Arabia									
ψ 2015	384 (4.1)	-27 ▼		381 (5.0)	-23 ▼		365 (4.2)	-38 ▼	
2011	410 (5.5)			404 (6.2)			403 (6.1)		
Serbia									
[3] 2015	524 (3.4)	-5		503 (3.8)	6		517 (3.8)	14 ▲	
[2] 2011	529 (3.0)			497 (3.7)			503 (3.7)		
Singapore									
[2] 2015	630 (4.2)	11 ▲	18 ▲	607 (4.2)	18 ▲	24 ▲	600 (4.1)	12 ▲	3
[2] 2011	619 (3.4)		8	589 (3.6)		5	588 (3.3)		-9
2007	611 (4.0)			584 (4.2)			597 (3.7)		
Slovak Republic									
2015	502 (2.4)	-9 ▼	2	491 (2.6)	-9	-3	496 (3.8)	-8	14 ▲
2011	511 (3.7)		11 ▲	500 (4.2)		6	504 (4.6)		22 ▲
2007	500 (4.0)			494 (5.3)			482 (5.6)		
Slovenia									
2015	511 (1.8)	8 ▲	21 ▲	530 (2.1)	4	10 ▲	540 (3.1)	8	28 ▲
2011	503 (2.5)		13 ▲	526 (2.2)		6 ▲	532 (2.4)		21 ▲
2007	490 (1.8)			520 (1.9)			512 (2.5)		
Spain									
[2] 2015	504 (2.5)	18 ▲		503 (2.8)	26 ▲		509 (3.1)	30 ▲	
2011	487 (2.9)			476 (2.9)			479 (3.6)		
Sweden									
[2] 2015	514 (2.7)	14 ▲	19 ▲	523 (3.3)	23 ▲	19 ▲	529 (3.9)	6	2
2011	500 (2.2)		5	500 (2.4)		-4	523 (3.0)		-4
2007	495 (2.5)			503 (2.9)			527 (3.4)		
Turkey									
2015	489 (3.2)	12 ▲		475 (3.0)	28 ▲		476 (3.4)	-2	
2011	477 (4.5)			447 (5.0)			478 (5.1)		
United Arab Emirates									
2015	455 (2.4)	17 ▲		442 (2.7)	24 ▲		453 (2.4)	16 ▲	
2011	438 (2.1)			418 (2.2)			437 (1.9)		
United States									
[2] † 2015	546 (2.2)	3	16 ▲	525 (2.6)	-9 ▼	3	540 (2.8)	-4	-5
[2] 2011	543 (2.0)		13 ▲	535 (2.2)		13 ▲	545 (1.8)		-1
[2] † 2007	529 (2.6)			522 (3.0)			546 (2.8)		

▲ More recent year significantly higher
▼ More recent year significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.5: Differences in Achievement for Mathematics Content Domains Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Number Average Scale Score	Number: Differences Between Years 2011	Number: Differences Between Years 2007	Geometric Shapes and Measures Average Scale Score	Geometric Shapes and Measures: Differences Between Years 2011	Geometric Shapes and Measures: Differences Between Years 2007	Data Display Average Scale Score	Data Display: Differences Between Years 2011	Data Display: Differences Between Years 2007
Benchmarking Participants									
Ontario, Canada									
2015	500 (2.6)	-4	4	526 (2.9)	-9	-3	536 (2.6)	-1	-9
2011	504 (3.4)		9	535 (3.5)		5	536 (3.6)		-9
2 2007	495 (3.5)			530 (3.7)			545 (4.0)		
Quebec, Canada									
‡ 2015	533 (4.2)	1	17 ▲	542 (4.6)	6	18 ▲	541 (5.0)	4	18 ▲
2011	531 (2.6)		16 ▲	536 (3.2)		12 ▲	538 (3.7)		15 ▲
2 2007	515 (3.0)			524 (3.8)			523 (4.4)		
Abu Dhabi, UAE									
2 ψ 2015	422 (4.7)	2		412 (5.1)	10		423 (4.8)	5	
2011	420 (4.7)			401 (5.3)			418 (4.4)		
Dubai, UAE									
2015	514 (1.5)	40 ▲	61 ▲	503 (1.9)	54 ▲	79 ▲	517 (1.7)	45 ▲	73 ▲
2011	474 (1.7)		21 ▲	449 (2.3)		26 ▲	471 (3.1)		27 ▲
◆◆ ‡ 2007	452 (2.1)			424 (3.4)			444 (3.0)		
Florida, US									
1 2015	556 (4.9)	8		529 (5.6)	-16 ▼		541 (6.1)	0	
1 3 2011	548 (3.2)			546 (3.9)			541 (3.6)		

▲ More recent year significantly higher

▼ More recent year significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.6: Differences in Achievement for Mathematics Content Domains Across Assessment Years

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Number Average Scale Score	Number: Differences Between Years 2011	Number: Differences Between Years 2007	Algebra Average Scale Score	Algebra: Differences Between Years 2011	Algebra: Differences Between Years 2007	Geometry Average Scale Score	Geometry: Differences Between Years 2011	Geometry: Differences Between Years 2007	Data and Chance Average Scale Score	Data and Chance: Differences Between Years 2011	Data and Chance: Differences Between Years 2007
Australia												
2015	511 (3.2)	-1	8	491 (3.4)	2	16 ▲	500 (3.1)	1	12 ▲	519 (3.1)	-16 ▼	-7
2011	513 (5.5)		9	489 (5.3)		15 ▲	499 (5.3)		11	534 (6.0)		8
2007	504 (4.0)			474 (4.2)			488 (4.0)			526 (4.4)		
Bahrain												
2015	436 (2.0)	39 ▲	54 ▲	483 (2.1)	58 ▲	86 ▲	449 (2.5)	51 ▲	46 ▲	453 (2.2)	46 ▲	53 ▲
ψ ◆◆ 2011	397 (1.7)		15 ▲	424 (1.7)		28 ▲	398 (2.5)		-5	407 (2.5)		8 ▲
2007	381 (2.5)			397 (1.7)			403 (2.9)			400 (2.6)		
Botswana (9)												
ψ 2015	393 (3.2)	1		400 (2.3)	-7		377 (2.5)	-4		374 (3.1)	-17 ▼	
ψ 2011	392 (3.2)			407 (3.2)			381 (3.1)			391 (3.0)		
Chile												
ψ 2015	427 (3.3)	15 ▲		413 (3.4)	11 ▲		428 (3.4)	9		429 (3.8)	4	
2011	413 (2.9)			403 (3.6)			419 (3.0)			426 (3.0)		
Chinese Taipei												
2015	590 (2.4)	-8	4	613 (2.8)	-15 ▼	-16 ▼	607 (2.6)	-18 ▼	2	588 (2.5)	4	9
2011	598 (3.2)		12 ▲	628 (3.8)		-1	625 (3.7)		20 ▲	584 (2.9)		5
2007	586 (4.3)			629 (5.9)			605 (5.7)			579 (4.6)		
Egypt												
ψ 2015	393 (3.7)		8	420 (4.3)		15 ▲	393 (4.1)		-4	338 (4.4)		-20 ▼
2007	386 (3.6)			405 (3.5)			397 (3.7)			358 (3.9)		
England												
2015	528 (4.5)	15 ▲	17 ▲	492 (4.7)	3	-4	514 (4.1)	16 ▲	1	541 (4.7)	-2	-11
‡ 2011	512 (5.9)		1	489 (5.8)		-7	498 (5.9)		-15 ▼	543 (7.0)		-9
† 2007	511 (5.4)			496 (5.1)			513 (5.2)			552 (6.2)		
Georgia												
1 2 2015	457 (3.4)	22 ▲	40 ▲	469 (3.8)	18 ▲	52 ▲	441 (3.9)	34 ▲	39 ▲	421 (3.7)	30 ▲	71 ▲
1 2011	435 (3.5)		19 ▲	450 (3.9)		34 ▲	406 (4.3)		5	392 (4.5)		42 ▲
1 2007	416 (5.9)			416 (7.6)			402 (7.1)			350 (5.1)		
Hong Kong SAR												
2015	594 (4.9)	6	19 ▲	593 (4.7)	10	18 ▲	602 (5.1)	4	22 ▲	597 (5.9)	16 ▲	37 ▲
2011	588 (3.7)		13	583 (4.0)		8	597 (4.4)		18 ▲	581 (4.1)		21 ▲
† 2007	575 (6.0)			575 (6.1)			580 (6.1)			560 (5.9)		
Hungary												
2015	518 (4.0)	8	-3	503 (4.1)	6	-5	518 (4.2)	17 ▲	8	519 (3.9)	2	-8
2011	510 (3.8)		-11	496 (4.0)		-11 ▼	501 (4.1)		-9	517 (4.2)		-10
2007	520 (3.8)			508 (3.8)			510 (4.0)			527 (3.9)		
Iran, Islamic Rep. of												
ψ 2015	432 (4.7)	30 ▲	44 ▲	437 (5.1)	15 ▲	33 ▲	448 (4.7)	10	33 ▲	417 (5.0)	24 ▲	21 ▲
ψ 2011	402 (5.0)		14 ▲	422 (4.4)		18 ▲	437 (4.7)		23 ▲	393 (4.9)		-3
2007	388 (4.4)			405 (4.2)			414 (4.7)			396 (3.8)		
Israel												
3 2015	518 (4.0)	0		517 (4.7)	-4		487 (4.6)	-9		503 (4.9)	-12	
3 2011	518 (4.1)			521 (4.7)			496 (4.4)			515 (4.7)		
Italy												
2 2015	494 (2.7)	-2	14 ▲	481 (3.0)	-10 ▼	21 ▲	504 (3.5)	-8	13 ▲	496 (2.7)	-3	12 ▲
2011	496 (2.8)		16 ▲	491 (2.6)		30 ▲	512 (3.5)		21 ▲	499 (3.1)		15 ▲
2007	480 (3.1)			460 (3.7)			491 (3.6)			485 (3.6)		
Japan												
2015	572 (2.4)	15 ▲	14 ▲	596 (2.8)	26 ▲	29 ▲	598 (2.6)	12 ▲	14 ▲	589 (2.3)	10 ▲	-2
2011	557 (3.0)		-2	570 (3.1)		3	586 (3.6)		2	579 (3.1)		-11 ▼
2007	558 (2.4)			567 (2.9)			584 (2.5)			591 (2.7)		

▲ More recent year significantly higher
▼ More recent year significantly lower

Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish or in Russian. South Africa (9) tested one year later.

⋇ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.

◆◆ Tested the same cohort of students as other countries, but later in the assessment year at the beginning of the next school year.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.6: Differences in Achievement for Mathematics Content Domains Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Number Average Scale Score	Number: Differences Between Years 2011	Number: Differences Between Years 2007	Algebra Average Scale Score	Algebra: Differences Between Years 2011	Algebra: Differences Between Years 2007	Geometry Average Scale Score	Geometry: Differences Between Years 2011	Geometry: Differences Between Years 2007	Data and Chance Average Scale Score	Data and Chance: Differences Between Years 2011	Data and Chance: Differences Between Years 2007
Jordan												
ж 2015	380 (3.2)	-10 ▼	-32 ▼	418 (3.5)	-14 ▼	-28 ▼	381 (3.4)	-26 ▼	-48 ▼	346 (4.0)	-33 ▼	-60 ▼
ψ 2011	390 (3.8)		-22 ▼	432 (3.9)		-14 ▼	407 (3.7)		-22 ▼	379 (3.9)		-27 ▼
2007	412 (4.8)			445 (4.3)			429 (4.2)			406 (4.3)		
Kazakhstan												
2015	516 (5.1)	37 ▲		555 (5.6)	49 ▲		529 (6.4)	39 ▲		492 (5.5)	48 ▲	
2011	479 (4.1)			506 (4.5)			491 (4.5)			444 (4.4)		
Korea, Rep. of												
2015	601 (2.4)	-17 ▼	9 ▲	612 (2.9)	-4	4	612 (3.4)	0	12 ▲	600 (2.4)	-15 ▼	-1
2011	618 (2.7)		25 ▲	617 (3.3)		9	612 (2.8)		12 ▲	616 (2.6)		14 ▲
2007	592 (2.5)			608 (3.3)			600 (2.7)			602 (2.6)		
Kuwait												
ψ 2015	376 (4.0)		38 ▲	364 (3.9)		23 ▲	366 (4.2)		-11 ▼	361 (4.3)		22 ▲
♦ 2007	338 (2.8)			341 (3.6)			377 (3.0)			339 (5.1)		
Lebanon												
2015	440 (4.1)	-11 ▼	-13 ▼	466 (4.0)	-5	-2	444 (4.0)	-4	-12 ▼	395 (4.6)	2	7
2011	451 (3.8)		-1	471 (3.8)		3	447 (3.8)		-8	393 (5.2)		5
2007	453 (3.9)			468 (3.6)			455 (4.2)			388 (5.3)		
Lithuania												
2 2015	512 (2.9)	11 ▲	5	498 (3.5)	6	10 ▲	516 (3.2)	16 ▲	7	524 (2.8)	9 ▲	-1
1 2011	501 (2.5)		-6	492 (2.8)		5	500 (3.2)		-9 ▼	515 (2.8)		-10 ▼
1 2007	507 (2.8)			487 (2.9)			509 (3.1)			526 (2.9)		
Malaysia												
2015	472 (3.6)	21 ▲	-22 ▼	467 (3.4)	37 ▲	11	455 (3.9)	23 ▲	-19 ▼	451 (3.8)	22 ▲	-7
2011	451 (5.8)		-43 ▼	430 (5.2)		-26 ▼	432 (6.4)		-42 ▼	429 (5.4)		-30 ▼
2007	494 (5.5)			455 (4.9)			474 (6.3)			459 (5.0)		
Malta												
2015	501 (1.6)		2	492 (1.8)		18 ▲	484 (1.7)		-10 ▼	487 (2.6)		5
2007	499 (1.1)			475 (1.5)			494 (1.4)			482 (2.1)		
Morocco												
ж 2015	382 (2.1)	3		372 (2.3)	16 ▲		410 (3.0)	20 ▲		353 (2.9)	21 ▲	
ж 2011	379 (2.5)			357 (2.6)			390 (2.5)			332 (1.9)		
New Zealand												
† 2015	500 (3.5)	7		475 (3.5)	3		488 (3.2)	5		509 (3.7)	-5	
2011	492 (6.0)			472 (5.6)			483 (5.6)			513 (6.9)		
Norway (8)												
2015	504 (2.2)	11 ▲	19 ▲	423 (2.7)	-9 ▼	-1	477 (2.4)	17 ▲	20 ▲	519 (3.0)	6	17 ▲
2011	492 (2.7)		8 ▲	432 (2.6)		8 ▲	461 (3.4)		3	513 (3.6)		11 ▲
2007	485 (2.1)			424 (2.7)			458 (2.5)			502 (2.9)		
Oman												
ψ 2015	389 (2.6)	38 ▲	35 ▲	426 (2.7)	43 ▲	43 ▲	415 (2.8)	38 ▲	38 ▲	376 (3.0)	34 ▲	11 ▲
ψ 2011	351 (2.9)		-4	383 (2.7)		0	377 (2.6)		0	342 (3.0)		-23 ▼
2007	354 (3.1)			384 (3.5)			377 (3.5)			365 (4.0)		

▲ More recent year significantly higher
▼ More recent year significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.6: Differences in Achievement for Mathematics Content Domains Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Number Average Scale Score	Number: Differences Between Years 2011	Number: Differences Between Years 2007	Algebra Average Scale Score	Algebra: Differences Between Years 2011	Algebra: Differences Between Years 2007	Geometry Average Scale Score	Geometry: Differences Between Years 2011	Geometry: Differences Between Years 2007	Data and Chance Average Scale Score	Data and Chance: Differences Between Years 2011	Data and Chance: Differences Between Years 2007
Qatar												
ψ 2015	435 (2.9)	27 ▲		452 (2.6)	27 ▲		433 (3.0)	45 ▲		417 (3.9)	27 ▲	
ψ 2011	408 (3.6)			425 (2.8)			387 (3.4)			390 (3.6)		
Russian Federation												
2015	533 (4.5)	-1	23 ▲	558 (5.2)	2	33 ▲	536 (5.6)	3	25 ▲	507 (5.0)	-4	24 ▲
2 2011	534 (3.4)		25 ▲	556 (3.8)		31 ▲	533 (4.0)		23 ▲	511 (4.0)		28 ▲
2007	510 (4.1)			525 (4.6)			510 (4.8)			483 (4.5)		
Saudi Arabia												
ж 2015	352 (4.5)	-41 ▼		391 (4.4)	-8		342 (5.3)	-22 ▼		361 (4.9)	-25 ▼	
ψ 2011	393 (4.8)			399 (4.9)			364 (5.4)			387 (5.3)		
Singapore												
2 2015	629 (3.2)	18 ▲	24 ▲	623 (3.4)	8	31 ▲	617 (3.5)	8	27 ▲	617 (3.4)	10	28 ▲
2 2011	611 (3.7)		6	614 (4.1)		23 ▲	609 (4.0)		19 ▲	607 (4.4)		18 ▲
2007	605 (3.8)			591 (4.0)			590 (4.1)			589 (5.2)		
Slovenia												
2015	524 (2.4)	13 ▲	20 ▲	498 (2.5)	5	8 ▲	522 (2.8)	18 ▲	22 ▲	525 (2.7)	7	16 ▲
2011	511 (2.5)		7	493 (2.7)		2	504 (3.1)		4	518 (3.3)		9 ▲
2007	504 (2.6)			491 (2.6)			500 (2.9)			509 (2.9)		
South Africa (9)												
ж 2015	368 (4.7)	10		394 (4.3)	32 ▲		364 (4.5)	48 ▲		357 (4.9)	24 ▲	
ж 2011	359 (2.6)			361 (2.6)			315 (3.1)			333 (3.5)		
Sweden												
2015	513 (2.9)	9 ▲	7 ▲	482 (3.2)	23 ▲	23 ▲	478 (3.4)	22 ▲	5	512 (3.7)	8	-14 ▼
2011	504 (1.8)		-2	459 (2.2)		0	456 (2.3)		-17 ▼	504 (2.8)		-22 ▼
2007	505 (1.9)			459 (2.7)			472 (2.8)			526 (3.9)		
Thailand												
2015	430 (5.0)	6	-12	429 (5.1)	4	-1	429 (4.9)	14	-8	425 (4.6)	-6	-14 ▼
2011	425 (4.7)		-18 ▼	425 (4.4)		-5	415 (5.4)		-22 ▼	431 (4.1)		-8
2007	443 (5.3)			431 (5.6)			437 (5.9)			438 (4.9)		
Turkey												
2015	447 (4.6)	13 ▲		459 (4.6)	4		463 (4.9)	8		467 (5.2)	-1	
2011	435 (4.0)			455 (4.3)			454 (4.4)			467 (4.0)		
United Arab Emirates												
2015	464 (1.9)	5		485 (2.0)	17 ▲		447 (2.4)	17 ▲		449 (2.5)	9 ▲	
2011	459 (2.3)			468 (2.2)			431 (2.4)			440 (2.4)		
United States												
† 2015	520 (3.1)	6	6	525 (3.1)	13 ▲	18 ▲	500 (3.2)	15 ▲	20 ▲	522 (3.5)	-5	-11 ▼
2 2011	514 (3.0)		0	512 (2.6)		5	485 (2.7)		5	527 (3.3)		-5
2 † 2007	514 (2.9)			507 (3.1)			480 (2.9)			533 (3.4)		
Benchmarking Participants												
Ontario, Canada												
2015	530 (3.0)	11 ▲	2	507 (3.0)	11 ▲	11 ▲	524 (3.5)	12 ▲	13 ▲	531 (3.9)	0	-16 ▼
2 2011	519 (2.8)		-9	497 (2.4)		1	512 (2.8)		1	531 (4.2)		-17 ▼
2 2007	528 (4.2)			496 (3.9)			510 (4.5)			547 (5.1)		
Quebec, Canada												
‡ 2015	557 (4.3)	14 ▲	19 ▲	530 (4.4)	15 ▲	18 ▲	540 (4.3)	12 ▲	13 ▲	546 (5.0)	-2	6
2011	543 (2.4)		5	516 (2.9)		4	529 (2.6)		1	549 (3.0)		8
3 2007	537 (3.7)			512 (3.6)			527 (3.5)			540 (3.8)		
Abu Dhabi, UAE												
2015	443 (4.4)	-10		462 (4.5)	3		425 (5.4)	1		426 (5.5)	-8	
2011	452 (4.0)			459 (3.9)			424 (4.5)			434 (4.3)		
Dubai, UAE												
2015	509 (2.5)	29 ▲	50 ▲	528 (2.7)	40 ▲	53 ▲	496 (2.6)	44 ▲	51 ▲	504 (3.0)	36 ▲	59 ▲
2011	479 (2.4)		21 ▲	489 (2.4)		13 ▲	453 (3.1)		7	468 (2.9)		23 ▲
♦♦ ‡ 2007	458 (3.3)			476 (2.6)			445 (3.6)			444 (3.5)		
Florida, US												
1 2015	498 (6.6)	-19 ▼		502 (6.8)	-11		470 (6.5)	-29 ▼		489 (8.1)	-39 ▼	
1 2 2011	517 (7.0)			513 (6.6)			499 (6.9)			528 (8.8)		

▲ More recent year significantly higher

▼ More recent year significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.7: Differences in Achievement for Mathematics Cognitive Domains Across Assessment Years

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Knowing Average Scale Score	Knowing: Differences Between Years 2011	Knowing: Differences Between Years 2007	Applying Average Scale Score	Applying: Differences Between Years 2011	Applying: Differences Between Years 2007	Reasoning Average Scale Score	Reasoning: Differences Between Years 2011	Reasoning: Differences Between Years 2007
Australia									
2015	509 (3.5)	-7	-2	521 (3.0)	2	-1	523 (3.0)	10 ▲	7
2011	516 (3.4)		5	519 (3.0)		-3	513 (2.7)		-3
2007	511 (4.1)			522 (3.6)			516 (3.7)		
Bahrain									
[2] 2015	453 (1.8)	15 ▲		450 (1.6)	19 ▲		447 (2.0)	8 ▲	
2011	438 (3.8)			431 (3.3)			439 (3.2)		
Belgium (Flemish)									
† 2015	554 (2.3)	-10 ▼		544 (2.2)	-2		536 (2.7)	4	
2011	564 (2.0)			546 (2.2)			532 (2.7)		
Chile									
2015	449 (2.8)	-7		462 (2.4)	0		466 (2.3)	-3	
2011	455 (2.4)			463 (2.4)			469 (2.5)		
Chinese Taipei									
2015	620 (2.3)	21 ▲	35 ▲	593 (2.1)	0	19 ▲	576 (3.1)	-2	5
2011	599 (2.0)		13 ▲	593 (2.1)		19 ▲	577 (2.5)		6
2007	586 (1.9)			574 (1.9)			571 (2.0)		
Croatia									
2015	502 (1.9)	8 ▲		499 (1.9)	15 ▲		507 (2.1)	15 ▲	
[2] 2011	495 (1.9)			484 (2.0)			492 (2.9)		
Czech Republic									
2015	519 (2.5)	17 ▲	48 ▲	528 (2.4)	16 ▲	35 ▲	544 (3.0)	21 ▲	52 ▲
2011	502 (2.4)		30 ▲	512 (2.8)		19 ▲	523 (2.5)		31 ▲
2007	472 (2.5)			493 (2.9)			491 (3.6)		
Denmark									
[2] † 2015	536 (3.3)	5	22 ▲	538 (2.8)	-1	11 ▲	548 (3.2)	5	22 ▲
[2] 2011	531 (2.7)		18 ▲	539 (2.9)		12 ▲	543 (2.7)		17 ▲
† 2007	514 (2.7)			527 (2.8)			525 (2.5)		
England									
2015	554 (3.3)	2	8	544 (3.2)	2	3	540 (3.2)	9	1
2011	552 (4.3)		6	542 (3.7)		0	531 (3.8)		-8
2007	546 (3.6)			542 (3.3)			539 (3.4)		
Finland									
2015	530 (2.2)	-18 ▼		536 (2.1)	-8 ▼		540 (3.1)	-5	
2011	548 (2.6)			544 (2.6)			546 (2.3)		
Georgia									
[1] 2015	466 (4.0)	16 ▲	21 ▲	461 (4.1)	14 ▲	31 ▲	452 (4.4)	1	19 ▲
[1] 2011	449 (3.7)		4	447 (3.4)		17 ▲	450 (3.3)		18 ▲
[1] 2007	445 (4.4)			430 (4.7)			433 (4.7)		
Germany									
2015	524 (2.3)	0	9 ▲	515 (2.2)	-13 ▼	-15 ▼	535 (2.4)	3	5
2011	524 (2.4)		9 ▲	528 (2.3)		-2	532 (3.0)		2
2007	515 (2.1)			530 (2.3)			530 (2.9)		
Hong Kong SAR									
† 2015	618 (3.1)	-1	-4	621 (3.1)	23 ▲	14 ▲	600 (3.2)	11 ▲	4
[2] 2011	619 (3.4)		-3	597 (3.4)		-9	589 (3.3)		-7
2007	622 (3.8)			606 (3.8)			596 (3.8)		
Hungary									
2015	532 (3.1)	13 ▲	21 ▲	526 (3.3)	13 ▲	20 ▲	529 (3.6)	15 ▲	20 ▲
2011	519 (3.8)		8	513 (3.3)		7	514 (3.7)		5
2007	511 (3.8)			506 (3.8)			510 (4.3)		

▲ More recent year significantly higher

▼ More recent year significantly lower

Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish or in Russian.

⋇ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

◆◆ Tested the same cohort of students as other countries, but later in the assessment year at the beginning of the next school year.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.7: Differences in Achievement for Mathematics Cognitive Domains Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Knowing Average Scale Score	Knowing Differences Between Years 2011	Knowing Differences Between Years 2007	Applying Average Scale Score	Applying Differences Between Years 2011	Applying Differences Between Years 2007	Reasoning Average Scale Score	Reasoning Differences Between Years 2011	Reasoning Differences Between Years 2007
Iran, Islamic Rep. of									
2015	429 (3.2)	-6	25 ▲	435 (2.9)	7	38 ▲	426 (3.3)	4	26 ▲
2011	435 (4.0)		31 ▲	427 (3.7)		30 ▲	423 (3.2)		22 ▲
2007	404 (3.9)			397 (4.0)			401 (4.3)		
Ireland									
2015	554 (2.9)	15 ▲		549 (2.2)	20 ▲		535 (2.7)	26 ▲	
2011	539 (3.1)			529 (2.7)			510 (3.1)		
Italy									
[2] 2015	511 (2.9)	1	-1	504 (2.5)	-2	5	503 (3.3)	-3	-8
2011	510 (2.8)		-3	506 (2.8)		7	505 (3.2)		-5
2007	512 (3.5)			499 (3.1)			511 (3.4)		
Japan									
2015	601 (2.4)	11 ▲	35 ▲	589 (2.1)	10 ▲	19 ▲	595 (2.7)	3	26 ▲
2011	590 (1.7)		24 ▲	579 (1.6)		9 ▲	592 (1.9)		22 ▲
2007	567 (2.4)			570 (2.2)			569 (2.3)		
Kazakhstan									
2015	546 (4.4)	43 ▲		541 (4.9)	42 ▲		553 (4.6)	52 ▲	
[2] 2011	503 (4.7)			499 (5.0)			501 (4.7)		
Korea, Rep. of									
2015	627 (2.9)	13 ▲		595 (2.1)	-5		619 (2.5)	16 ▲	
2011	614 (2.0)			600 (2.2)			603 (2.3)		
Kuwait									
ψ 2015	326 (3.0)	-16 ▼		322 (3.3)	-8		306 (3.4)	-23 ▼	
[1] Ж 2011	343 (3.5)			330 (4.6)			329 (3.6)		
Lithuania									
[2] 2015	534 (2.8)	8 ▲	14 ▲	538 (2.9)	-2	-3	536 (3.2)	-1	7
[1] [2] 2011	525 (2.9)		5	540 (2.4)		0	536 (2.5)		8 ▲
[1] 2007	520 (2.8)			540 (2.7)			529 (2.8)		
Morocco									
2015	377 (3.7)	57 ▲		375 (3.6)	43 ▲		379 (3.6)	32 ▲	
Ж 2011	320 (4.3)			332 (3.9)			347 (4.2)		
Netherlands									
† 2015	521 (1.8)	-17 ▼	-8 ▼	531 (1.7)	-10 ▼	-10 ▼	543 (2.6)	0	6
† 2011	537 (2.0)		9 ▲	540 (1.7)		0	543 (2.7)		7
‡ 2007	528 (2.3)			540 (2.2)			537 (2.5)		
New Zealand									
2015	475 (2.6)	-1	-8 ▼	497 (2.5)	7 ▲	4	504 (2.7)	13 ▲	2
2011	476 (3.2)		-7	490 (2.4)		-3	490 (2.5)		-12 ▼
2007	484 (2.7)			493 (2.5)			502 (2.7)		
Northern Ireland									
‡ 2015	582 (3.9)	2		575 (3.2)	11 ▲		550 (3.3)	12 ▲	
† 2011	580 (3.4)			565 (2.9)			538 (3.4)		
Norway (4)									
2015	479 (2.6)	-8	20 ▲	495 (2.5)	-4	20 ▲	506 (3.0)	5	20 ▲
‡ 2011	487 (3.2)		28 ▲	499 (2.9)		24 ▲	501 (3.2)		15 ▲
2007	459 (3.0)			475 (2.9)			486 (2.9)		
Oman									
2015	422 (2.7)	43 ▲		428 (2.4)	46 ▲		420 (2.4)	29 ▲	
ψ 2011	380 (3.2)			382 (2.9)			391 (2.7)		
Portugal									
[2] 2015	548 (2.6)	17 ▲		540 (2.4)	6		532 (2.3)	1	
2011	531 (3.3)			534 (3.7)			531 (3.7)		
Qatar									
2015	444 (3.4)	33 ▲		434 (3.5)	23 ▲		431 (4.4)	15 ▲	
[2] 2011	411 (3.7)			411 (3.4)			416 (4.4)		

▲ More recent year significantly higher
▼ More recent year significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.7: Differences in Achievement for Mathematics Cognitive Domains Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Knowing Average Scale Score	Knowing: Differences Between Years 2011	Knowing: Differences Between Years 2007	Applying Average Scale Score	Applying: Differences Between Years 2011	Applying: Differences Between Years 2007	Reasoning Average Scale Score	Reasoning: Differences Between Years 2011	Reasoning: Differences Between Years 2007
Russian Federation									
2015	556 (3.4)	16 ▲	18 ▲	566 (3.7)	27 ▲	18 ▲	570 (4.0)	22 ▲	26 ▲
2011	541 (3.4)		2	539 (3.9)		-9	548 (3.4)		4
2007	539 (5.0)			549 (5.2)			544 (5.1)		
Saudi Arabia									
ψ 2015	374 (4.6)	-36 ▼		382 (4.5)	-23 ▼		383 (4.3)	-29 ▼	
2011	409 (6.0)			405 (5.8)			412 (6.0)		
Serbia									
[3] 2015	513 (3.5)	-7		521 (3.4)	10 ▲		517 (3.8)	2	
[2] 2011	520 (3.0)			511 (3.2)			514 (3.9)		
Singapore									
[2] 2015	631 (4.0)	2	5	619 (4.0)	17 ▲	23 ▲	603 (4.5)	15 ▲	19 ▲
[2] 2011	629 (3.6)		4	602 (3.4)		5	588 (3.7)		4
2007	625 (4.2)			597 (4.1)			584 (4.0)		
Slovak Republic									
2015	491 (2.4)	-16 ▼	-1	497 (2.5)	-9	1	515 (2.9)	5	17 ▲
2011	506 (3.7)		15 ▲	505 (3.9)		9	511 (3.8)		12 ▲
2007	491 (4.4)			496 (4.4)			499 (4.8)		
Slovenia									
2015	517 (1.9)	7 ▲	19 ▲	521 (2.1)	7 ▲	19 ▲	524 (2.2)	8 ▲	20 ▲
2011	510 (2.7)		12 ▲	514 (2.3)		12 ▲	516 (2.6)		12 ▲
2007	498 (2.0)			502 (2.0)			504 (2.5)		
Spain									
[2] 2015	505 (2.4)	23 ▲		505 (2.4)	22 ▲		502 (2.5)	19 ▲	
2011	482 (3.4)			483 (3.1)			483 (2.9)		
Sweden									
[2] 2015	501 (3.4)	12 ▲	18 ▲	521 (2.7)	14 ▲	16 ▲	542 (3.3)	22 ▲	22 ▲
2011	489 (2.2)		6	507 (2.2)		2	520 (2.9)		0
2007	483 (2.6)			506 (2.4)			519 (2.8)		
Turkey									
2015	491 (3.4)	17 ▲		482 (3.5)	13 ▲		466 (3.5)	5	
2011	475 (5.3)			469 (4.7)			462 (4.3)		
United Arab Emirates									
2015	453 (2.7)	16 ▲		452 (2.5)	22 ▲		445 (2.4)	11 ▲	
2011	437 (2.2)			430 (2.0)			434 (2.3)		
United States									
[2] † 2015	547 (2.3)	-8 ▼	6	537 (2.4)	-2	13 ▲	531 (2.5)	5	6
[2] 2011	556 (2.1)		14 ▲	539 (2.1)		15 ▲	525 (2.1)		1
[2] † 2007	541 (2.8)			524 (2.8)			525 (2.4)		

▲ More recent year significantly higher
▼ More recent year significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.7: Differences in Achievement for Mathematics Cognitive Domains Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Knowing Average Scale Score	Knowing: Differences Between Years 2011	Knowing: Differences Between Years 2007	Applying Average Scale Score	Applying: Differences Between Years 2011	Applying: Differences Between Years 2007	Reasoning Average Scale Score	Reasoning: Differences Between Years 2011	Reasoning: Differences Between Years 2007
Benchmarking Participants									
Ontario, Canada									
2015	505 (2.5)	-5	7	513 (2.3)	-8	0	524 (2.6)	3	-2
2011	510 (3.4)		11 ▲	521 (3.4)		8	522 (3.1)		-5
2 2007	498 (3.5)			513 (3.3)			526 (3.1)		
Quebec, Canada									
‡ 2015	542 (4.3)	6	23 ▲	533 (4.1)	3	17 ▲	536 (4.9)	2	14 ▲
2011	536 (2.4)		18 ▲	529 (2.4)		13 ▲	534 (2.5)		12 ▲
2 2007	519 (3.3)			516 (3.1)			523 (3.2)		
Abu Dhabi, UAE									
2 ψ 2015	418 (5.1)	0		422 (4.8)	9		414 (4.4)	-5	
2011	418 (4.9)			413 (4.7)			418 (4.5)		
Dubai, UAE									
2015	514 (2.0)	42 ▲	60 ▲	510 (1.8)	45 ▲	74 ▲	507 (1.7)	44 ▲	66 ▲
2011	472 (2.4)		18 ▲	465 (2.3)		29 ▲	464 (2.2)		23 ▲
◆ ‡ 2007	454 (2.5)			436 (2.2)			441 (3.0)		
Florida, US									
1 2015	555 (5.2)	-13 ▼		545 (4.9)	3		534 (6.2)	11	
1 3 2011	568 (3.7)			542 (3.6)			523 (3.9)		

▲ More recent year significantly higher
▼ More recent year significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.8: Differences in Achievement for Mathematics Cognitive Domains Across Assessment Years

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Knowing Average Scale Score	Knowing: Differences Between Years 2011	Knowing: Differences Between Years 2007	Applying Average Scale Score	Applying: Differences Between Years 2011	Applying: Differences Between Years 2007	Reasoning Average Scale Score	Reasoning: Differences Between Years 2011	Reasoning: Differences Between Years 2007
Australia									
2015	504 (3.1)	0	15 ▲	502 (3.0)	-4	4	512 (3.1)	6	9
2011	504 (5.2)		14 ▲	506 (4.9)		8	506 (5.2)		3
2007	490 (3.9)			498 (3.8)			503 (4.0)		
Bahrain									
2015	463 (2.3)	52 ▲	74 ▲	445 (1.7)	45 ▲	45 ▲	452 (2.2)	37 ▲	46 ▲
ψ ◆◆ 2011	411 (2.4)		23 ▲	400 (2.4)		0	415 (2.1)		9 ▲
2007	389 (1.8)			400 (2.4)			406 (2.4)		
Botswana (9)									
ψ 2015	394 (3.0)	-10 ▼		385 (2.3)	2		389 (2.0)	-9 ▼	
ψ 2011	404 (2.7)			383 (2.8)			398 (2.4)		
Chile									
ψ 2015	423 (3.4)	17 ▲		427 (3.3)	2		432 (3.3)	10 ▲	
2011	405 (2.9)			425 (2.6)			422 (2.9)		
Chinese Taipei									
2015	598 (2.9)	-13 ▼	-6	602 (2.5)	-12 ▼	5	602 (2.5)	-7	0
2011	611 (3.6)		7	614 (3.4)		17 ▲	609 (3.4)		7
2007	604 (5.0)			597 (4.8)			602 (4.4)		
Egypt									
ψ 2015	399 (4.3)		14 ▲	385 (3.9)		-6	379 (4.3)		-7
2007	385 (3.7)			391 (3.9)			386 (3.7)		
England									
2015	513 (4.1)	12	5	519 (4.1)	11	6	522 (4.4)	12	4
‡ 2011	501 (5.5)		-6	508 (5.6)		-5	510 (5.6)		-8
† 2007	508 (4.7)			514 (5.1)			518 (5.1)		
Georgia									
1 2 2015	456 (4.1)	18 ▲	37 ▲	454 (3.6)	30 ▲	55 ▲	441 (4.5)	27 ▲	57 ▲
1 2011	438 (4.1)		19 ▲	425 (3.8)		26 ▲	414 (4.0)		30 ▲
1 2007	419 (6.1)			399 (5.9)			383 (6.1)		
Hong Kong SAR									
2015	600 (5.1)	9	17 ▲	595 (4.5)	8	23 ▲	591 (5.1)	11	24 ▲
2011	591 (4.1)		8	587 (3.8)		15 ▲	580 (4.0)		13
† 2007	583 (6.0)			572 (6.2)			567 (6.1)		
Hungary									
2015	511 (3.9)	4	-10	516 (3.8)	11 ▲	3	515 (3.9)	13 ▲	0
2011	507 (3.9)		-15 ▼	505 (3.6)		-9	502 (3.8)		-13 ▼
2007	522 (3.7)			513 (3.5)			515 (3.7)		
Iran, Islamic Rep. of									
ψ 2015	435 (4.9)	25 ▲	38 ▲	434 (4.4)	23 ▲	35 ▲	436 (4.7)	8	19 ▲
ψ 2011	410 (4.4)		13 ▲	411 (4.6)		12	428 (4.3)		11
2007	397 (4.3)			399 (4.4)			417 (3.9)		
Israel									
3 2015	511 (4.2)	-5		512 (4.0)	-1		510 (4.4)	-10	
3 2011	516 (4.2)			513 (4.4)			520 (4.2)		
Italy									
2 2015	489 (2.7)	-5	15 ▲	495 (2.6)	-8 ▼	13 ▲	500 (2.8)	4	18 ▲
2011	494 (2.7)		20 ▲	503 (2.3)		20 ▲	496 (2.6)		14 ▲
2007	474 (3.4)			482 (3.0)			482 (3.4)		
Japan									
2015	578 (2.6)	20 ▲	9 ▲	592 (2.3)	17 ▲	23 ▲	591 (2.6)	12 ▲	14 ▲
2011	558 (2.8)		-11 ▼	574 (2.5)		6	579 (3.0)		2
2007	569 (2.9)			568 (2.3)			577 (2.6)		

▲ More recent year significantly higher

▼ More recent year significantly lower

Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish or in Russian. South Africa (9) tested one year later.

ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.

◆◆ Tested the same cohort of students as other countries, but later in the assessment year at the beginning of the next school year.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.8: Differences in Achievement for Mathematics Cognitive Domains Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country		Knowing Average Scale Score	Knowing: Differences Between Years 2011	Knowing: Differences Between Years 2007	Applying Average Scale Score	Applying: Differences Between Years 2011	Applying: Differences Between Years 2007	Reasoning Average Scale Score	Reasoning: Differences Between Years 2011	Reasoning: Differences Between Years 2007
Jordan										
ж	2015	391 (3.2)	-14 ▼	-35 ▼	378 (3.2)	-19 ▼	-43 ▼	380 (3.3)	-36 ▼	-55 ▼
ψ	2011	405 (4.2)		-20 ▼	397 (3.7)		-24 ▼	416 (4.0)		-19 ▼
	2007	425 (4.5)			421 (4.5)			434 (4.1)		
Kazakhstan										
	2015	533 (6.3)	44 ▲		527 (5.4)	43 ▲		525 (5.5)	42 ▲	
	2011	489 (4.4)			484 (4.3)			482 (4.9)		
Korea, Rep. of										
	2015	607 (2.8)	-9 ▼	-1	606 (2.8)	-10 ▼	6	608 (2.7)	-5	15 ▲
	2011	616 (3.1)		8	617 (2.8)		16 ▲	612 (2.6)		20 ▲
	2007	608 (3.1)			600 (2.8)			592 (2.5)		
Kuwait										
ψ	2015	381 (3.8)		37 ▲	371 (4.1)		13 ▲	353 (4.2)		11 ▲
♦	2007	344 (3.4)			358 (2.5)			342 (3.5)		
Lebanon										
	2015	456 (3.8)	-8	-1	439 (3.9)	3	-8	406 (4.5)	-20 ▼	-17 ▼
	2011	464 (3.9)		7	436 (4.1)		-11	426 (4.6)		3
	2007	457 (4.2)			447 (4.5)			423 (4.7)		
Lithuania										
2	2015	503 (3.2)	1	-6	521 (2.8)	14 ▲	10 ▲	502 (3.2)	10 ▲	15 ▲
1	2011	502 (2.6)		-8 ▼	508 (2.4)		-3	493 (2.6)		6
1	2007	509 (2.7)			511 (2.5)			487 (2.8)		
Malaysia										
	2015	472 (3.8)	28 ▲	-1	463 (3.6)	24 ▲	-14 ▼	453 (3.7)	27 ▲	-13 ▼
	2011	444 (5.8)		-29 ▼	439 (5.3)		-38 ▼	426 (5.6)		-40 ▼
	2007	473 (5.4)			477 (5.2)			466 (4.6)		
Malta										
	2015	499 (1.5)		9 ▲	493 (1.5)		3	484 (2.2)		10 ▲
	2007	490 (2.2)			491 (1.3)			474 (1.2)		
Morocco										
ж	2015	382 (2.4)	19 ▲		385 (2.2)	7 ▲		374 (2.8)	17 ▲	
ж	2011	363 (2.3)			378 (2.0)			357 (2.8)		
New Zealand										
†	2015	488 (3.4)	7		493 (3.3)	2		499 (3.5)	5	
	2011	481 (5.7)			491 (5.2)			494 (5.5)		
Norway (8)										
	2015	476 (2.6)	12 ▲	19 ▲	492 (2.3)	12 ▲	17 ▲	488 (2.3)	10 ▲	14 ▲
	2011	465 (2.4)		8 ▲	480 (2.7)		5	478 (3.0)		4
	2007	457 (2.0)			475 (2.5)			474 (2.5)		
Oman										
ψ	2015	401 (3.1)	37 ▲	36 ▲	401 (2.5)	41 ▲	36 ▲	402 (3.1)	33 ▲	14 ▲
ψ	2011	365 (3.0)		-1	360 (3.0)		-5	369 (3.0)		-20 ▼
	2007	366 (3.6)			365 (3.1)			389 (3.1)		

▲ More recent year significantly higher
▼ More recent year significantly lower

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Exhibit 3.8: Differences in Achievement for Mathematics Cognitive Domains Across Assessment Years (Continued)

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Knowing Average Scale Score	Knowing: Differences Between Years 2011	Knowing: Differences Between Years 2007	Applying Average Scale Score	Applying: Differences Between Years 2011	Applying: Differences Between Years 2007	Reasoning Average Scale Score	Reasoning: Differences Between Years 2011	Reasoning: Differences Between Years 2007
Qatar									
ψ 2015	440 (3.1)	22 ▲		435 (2.9)	39 ▲		431 (2.8)	25 ▲	
ψ 2011	418 (3.0)			396 (3.4)			406 (3.6)		
Russian Federation									
2015	543 (5.6)	-5	22 ▲	541 (4.6)	3	31 ▲	528 (5.0)	-4	28 ▲
2 2011	548 (3.8)		28 ▲	538 (3.6)		28 ▲	531 (3.8)		32 ▲
2007	521 (4.5)			510 (3.9)			499 (4.0)		
Saudi Arabia									
ж 2015	359 (4.9)	-42 ▼		364 (4.2)	-11		374 (4.0)	-13 ▼	
ψ 2011	402 (4.8)			375 (4.8)			388 (4.9)		
Singapore									
2 2015	633 (3.4)	16 ▲	41 ▲	619 (3.2)	7	22 ▲	616 (3.7)	12 ▲	27 ▲
2 2011	617 (3.9)		25 ▲	613 (4.0)		16 ▲	604 (4.3)		15 ▲
2007	592 (3.7)			597 (3.9)			589 (4.5)		
Slovenia									
2015	518 (2.4)	10 ▲	17 ▲	514 (2.1)	12 ▲	12 ▲	516 (2.7)	16 ▲	19 ▲
2011	508 (2.4)		7 ▲	502 (2.1)		0	500 (2.7)		3
2007	501 (2.5)			502 (2.2)			497 (2.8)		
South Africa (9)									
ж 2015	371 (5.2)	19 ▲		362 (4.6)	26 ▲		383 (4.2)	20 ▲	
ж 2011	352 (2.3)			336 (2.7)			363 (2.5)		
Sweden									
2015	484 (2.8)	7	4	507 (2.8)	17 ▲	12 ▲	509 (3.5)	32 ▲	17 ▲
2011	478 (2.0)		-2	489 (2.2)		-6	478 (2.4)		-15 ▼
2007	480 (2.2)			495 (2.2)			493 (2.8)		
Thailand									
2015	425 (5.1)	2	-6	431 (4.7)	3	-13	435 (4.8)	6	-16 ▼
2011	423 (4.6)		-8	428 (4.0)		-16 ▼	429 (4.2)		-23 ▼
2007	432 (5.2)			444 (4.8)			452 (5.0)		
Turkey									
2015	447 (4.9)	7		460 (4.3)	1		472 (4.8)	7	
2011	441 (4.2)			459 (4.0)			465 (3.7)		
United Arab Emirates									
2015	476 (2.2)	9 ▲		457 (2.1)	16 ▲		461 (2.2)	12 ▲	
2011	467 (2.2)			442 (2.3)			449 (2.2)		
United States									
† 2015	528 (3.5)	9 ▲	11 ▲	515 (3.2)	12 ▲	13 ▲	514 (3.1)	11 ▲	8
2 2011	519 (2.7)		2	503 (2.9)		1	503 (2.7)		-3
2 † 2007	517 (2.9)			502 (3.1)			506 (2.8)		
Benchmarking Participants									
Ontario, Canada									
2015	513 (3.0)	10 ▲	4	522 (2.8)	12 ▲	4	534 (3.1)	10 ▲	9
2 2011	503 (2.6)		-6	510 (2.3)		-8	524 (2.7)		-1
2 2007	509 (3.6)			518 (4.0)			526 (3.8)		
Quebec, Canada									
‡ 2015	541 (4.2)	13 ▲	16 ▲	546 (4.0)	11 ▲	17 ▲	538 (4.2)	9	10
2011	528 (2.9)		4	536 (2.7)		6	529 (2.7)		1
3 2007	524 (3.1)			529 (3.3)			528 (3.5)		
Abu Dhabi, UAE									
2015	453 (4.8)	-6		434 (4.7)	-1		440 (4.7)	-2	
2011	459 (3.8)			434 (4.3)			442 (4.2)		
Dubai, UAE									
2015	521 (2.3)	33 ▲	56 ▲	505 (2.5)	40 ▲	51 ▲	509 (2.8)	40 ▲	50 ▲
2011	488 (2.4)		23 ▲	465 (2.5)		11 ▲	470 (2.7)		10 ▲
♦♦ ‡ 2007	465 (2.6)			454 (3.2)			460 (3.0)		
Florida, US									
1 2015	501 (7.3)	-22 ▼		488 (6.7)	-16		491 (6.6)	-14	
1 2 2011	524 (6.9)			504 (7.4)			505 (6.9)		

▲ More recent year significantly higher
▼ More recent year significantly lower

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.9: Achievement in Mathematics Content Domains by Gender

Country	Number		Geometric Shapes and Measures		Data Display	
	Girls	Boys	Girls	Boys	Girls	Boys
Australia	503 (3.3)	515 (4.2) ▲	523 (3.7)	531 (3.8) ▲	530 (4.6)	535 (5.6)
2 Bahrain	458 (1.7) ▲	448 (2.5)	458 (2.4) ▲	436 (2.7)	469 (4.1) ▲	440 (2.9)
† Belgium (Flemish)	538 (2.5)	548 (2.3) ▲	562 (2.5)	565 (3.0)	525 (2.9)	522 (4.6)
Bulgaria	531 (5.0)	528 (4.6)	530 (6.5) ▲	520 (5.7)	509 (8.7) ▲	500 (7.0)
1 2 † Canada	497 (2.6)	509 (2.6) ▲	513 (2.7)	521 (2.8) ▲	526 (2.7)	531 (3.1)
Chile	454 (3.2)	455 (3.2)	459 (3.5)	460 (3.5)	462 (3.7)	464 (4.3)
Chinese Taipei	595 (2.4)	603 (2.3) ▲	597 (3.4)	597 (3.4)	591 (3.3)	592 (2.7)
Croatia	491 (2.3)	505 (2.4) ▲	506 (2.7)	519 (2.9) ▲	494 (3.2)	503 (3.4) ▲
Cyprus	523 (3.0)	534 (2.9) ▲	524 (3.2)	523 (3.4)	506 (4.1)	509 (4.4)
Czech Republic	524 (3.0)	532 (2.5) ▲	529 (3.5)	533 (2.8)	522 (3.4)	528 (3.7)
2 † Denmark	530 (3.1)	539 (3.2) ▲	553 (4.1)	557 (3.6)	526 (5.1)	526 (3.1)
England	542 (3.4)	552 (3.9) ▲	538 (3.6)	546 (3.9) ▲	555 (4.1)	549 (3.9)
Finland	536 (2.9) ▲	528 (2.6)	545 (2.5) ▲	534 (2.9)	550 (3.8) ▲	534 (3.6)
France	478 (3.4)	488 (3.1) ▲	500 (4.0)	507 (2.9) ▲	474 (4.6)	477 (4.0)
1 Georgia	484 (3.8)	482 (4.2)	430 (5.2)	427 (6.0)	443 (5.8)	427 (6.2)
Germany	511 (2.3)	519 (2.4) ▲	531 (2.9)	531 (3.1)	535 (3.2)	535 (3.0)
† Hong Kong SAR	610 (4.1)	621 (3.1) ▲	611 (4.5)	622 (3.8) ▲	608 (4.4)	613 (4.3)
Hungary	527 (3.2)	535 (3.8) ▲	530 (4.1)	542 (4.1) ▲	513 (4.0)	512 (4.3)
Indonesia	407 (3.8) ▲	392 (3.8)	394 (4.4)	395 (4.7)	392 (4.6) ▲	378 (4.5)
Iran, Islamic Rep. of	439 (4.7)	431 (4.5)	437 (4.7) ▲	419 (5.0)	423 (4.8) ▲	408 (4.6)
Ireland	549 (2.6)	553 (3.0)	538 (3.2)	546 (3.7) ▲	547 (5.5)	548 (4.1)
2 Italy	499 (2.6)	520 (2.8) ▲	497 (2.9)	510 (3.5) ▲	490 (3.1)	506 (3.8) ▲
Japan	591 (2.2)	592 (2.7)	605 (3.4)	597 (3.1)	594 (4.1)	593 (2.9)
Jordan	396 (3.4) ▲	380 (5.1)	408 (3.6) ▲	383 (5.2)	401 (3.4) ▲	364 (5.4)
Kazakhstan	553 (4.2)	551 (4.5)	539 (6.0)	540 (6.3)	528 (5.8)	520 (6.1)
Korea, Rep. of	605 (2.7)	614 (2.9) ▲	608 (2.7)	612 (3.0)	606 (2.7)	608 (4.1)
ψ Kuwait	360 (5.9)	353 (5.1)	350 (6.0) ▲	325 (5.8)	357 (6.0) ▲	333 (6.4)
2 Lithuania	539 (3.1)	537 (3.3)	527 (4.0)	524 (3.6)	542 (3.7)	538 (6.4)
Morocco	381 (3.5)	381 (4.0)	387 (3.9)	384 (4.4)	357 (4.4) ▲	345 (4.8)
† Netherlands	526 (2.6)	537 (2.6) ▲	518 (2.1)	525 (2.4) ▲	538 (3.3)	540 (4.3)
New Zealand	483 (3.1)	488 (3.1)	487 (3.7)	490 (2.7)	506 (3.3)	506 (3.5)
‡ Northern Ireland	573 (4.1)	576 (3.1)	564 (4.1)	568 (3.9)	566 (4.5)	567 (4.2)
Norway (5)	543 (2.7)	541 (3.2)	562 (3.3)	556 (4.6)	573 (3.0) ▲	559 (4.0)
Oman	432 (3.6) ▲	413 (2.8)	440 (3.2) ▲	421 (3.3)	428 (3.0) ▲	400 (3.5)
Poland	532 (2.7)	537 (2.8)	535 (2.8)	532 (3.1)	534 (3.6)	542 (3.4)
2 Portugal	535 (2.5)	546 (2.8) ▲	534 (3.5)	544 (3.3) ▲	542 (2.8)	550 (4.0)
Qatar	445 (4.4)	448 (4.7)	429 (5.0)	417 (6.1)	437 (4.8)	434 (5.9)
Russian Federation	567 (3.8)	567 (3.5)	558 (4.5)	556 (4.8)	572 (4.3)	573 (4.1)
ψ Saudi Arabia	401 (4.5) ▲	368 (6.6)	405 (5.1) ▲	358 (8.0)	394 (4.5) ▲	337 (7.1)
3 Serbia	523 (3.5)	525 (4.6)	504 (4.5)	501 (5.0)	522 (5.1)	512 (4.5)
2 Singapore	632 (4.3)	628 (4.7)	610 (4.5)	605 (4.5)	603 (4.2)	597 (5.2)
Slovak Republic	496 (2.9)	508 (2.7) ▲	483 (3.1)	498 (2.8) ▲	493 (4.8)	499 (3.7)
Slovenia	507 (2.2)	515 (2.4) ▲	530 (2.5)	530 (2.6)	541 (3.7)	539 (3.5)
South Africa (5)	386 (3.6) ▲	371 (4.3)	367 (3.9) ▲	353 (4.6)	391 (4.3) ▲	371 (4.9)
2 Spain	497 (2.8)	511 (2.7) ▲	497 (3.1)	508 (3.1) ▲	506 (3.5)	512 (3.6)
2 Sweden	513 (3.1)	515 (3.1)	524 (3.7)	522 (3.7)	535 (5.1) ▲	523 (3.9)
Turkey	487 (3.3)	491 (3.6)	474 (3.4)	476 (3.5)	478 (4.3)	474 (4.0)
United Arab Emirates	455 (3.9)	455 (3.4)	446 (4.0)	438 (3.7)	458 (4.0)	449 (3.5)
2 † United States	542 (2.2)	549 (2.7) ▲	519 (2.5)	532 (3.0) ▲	538 (3.2)	542 (2.8)
International Avg.	505 (0.5)	507 (0.5) ▲	504 (0.5) ▲	503 (0.6)	505 (0.6) ▲	499 (0.6)

▲ Average significantly higher than other gender

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.9: Achievement in Mathematics Content Domains by Gender (Continued)

Country	Number		Geometric Shapes and Measures		Data Display	
	Girls	Boys	Girls	Boys	Girls	Boys
Benchmarking Participants						
Buenos Aires, Argentina	442 (3.4)	448 (3.2)	401 (4.2)	405 (3.1)	410 (4.6)	412 (3.6)
Ontario, Canada	495 (3.1)	504 (2.9) ▲	523 (3.0)	530 (3.6) ▲	534 (3.0)	537 (3.0)
‡ Quebec, Canada	526 (4.1)	539 (5.1) ▲	538 (4.5)	547 (5.5) ▲	539 (5.2)	543 (5.7)
Norway (4)	487 (2.6)	491 (3.4)	498 (3.6)	500 (4.1)	495 (3.4)	495 (4.3)
[2] ψ Abu Dhabi, UAE	422 (7.9)	421 (6.5)	416 (8.2)	407 (7.1)	429 (8.1)	418 (6.8)
Dubai, UAE	511 (3.1)	516 (2.9)	503 (3.8)	502 (3.3)	518 (3.9)	516 (3.0)
[1] Florida, US	556 (4.9)	556 (5.4)	531 (5.5)	527 (7.0)	546 (6.3)	536 (7.0)

▲ Average significantly higher than other gender

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.10: Achievement in Mathematics Content Domains by Gender

Country	Number		Algebra		Geometry		Data and Chance	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Australia	506 (4.1)	517 (3.5) ▲	492 (4.3)	489 (3.7)	500 (4.0)	500 (3.6)	518 (4.1)	520 (3.6)
Bahrain	437 (3.3)	434 (2.2)	492 (2.2) ▲	474 (3.0)	459 (3.9) ▲	440 (3.7)	462 (3.6) ▲	444 (3.4)
ψ Botswana (9)	404 (3.9) ▲	382 (3.7)	410 (3.0) ▲	389 (2.5)	374 (3.2)	380 (4.0)	386 (3.5) ▲	361 (4.8)
1 † Canada	532 (2.4)	542 (2.9) ▲	512 (2.2)	514 (2.8)	525 (2.4)	528 (3.2)	532 (2.9)	536 (3.5)
ψ Chile	413 (3.9)	440 (4.1) ▲	411 (3.8)	415 (4.5)	419 (4.7)	435 (4.3) ▲	419 (4.4)	439 (4.9) ▲
Chinese Taipei	585 (2.7)	594 (3.0) ▲	617 (2.8)	610 (3.8)	610 (2.9)	604 (3.3)	586 (3.3)	590 (3.0)
ψ Egypt	394 (5.2)	392 (4.2)	427 (5.6) ▲	412 (5.4)	398 (6.0)	387 (4.6)	344 (6.2)	332 (6.0)
England	524 (5.9)	531 (5.3)	497 (5.8)	488 (5.5)	519 (5.1)	509 (5.0)	544 (5.5)	539 (5.7)
1 2 Georgia	453 (3.7)	460 (4.2)	474 (4.6)	464 (4.8)	441 (4.1)	440 (4.8)	422 (4.4)	421 (5.7)
Hong Kong SAR	590 (5.2)	598 (6.3)	593 (4.7)	593 (6.2)	601 (5.2)	602 (6.6)	593 (6.7)	601 (7.1)
Hungary	508 (4.6)	527 (4.5) ▲	503 (4.5)	502 (4.5)	517 (4.8)	520 (4.6)	513 (4.7)	525 (4.4) ▲
ψ Iran, Islamic Rep. of	426 (5.3)	437 (7.6)	447 (6.2)	428 (8.3)	455 (5.5)	441 (7.7)	416 (5.5)	418 (8.4)
Ireland	540 (3.2)	549 (4.7) ▲	502 (2.8)	500 (4.0)	500 (3.1)	507 (4.3)	530 (4.1)	538 (5.1)
3 Israel	510 (4.6)	525 (4.5) ▲	521 (4.9)	513 (5.4)	492 (5.3)	483 (5.3)	499 (5.4)	507 (5.5)
2 Italy	484 (3.5)	503 (2.9) ▲	485 (3.4) ▲	478 (3.2)	508 (4.4)	500 (3.6)	491 (3.4)	501 (3.4) ▲
Japan	569 (3.4)	576 (3.4)	601 (3.9) ▲	590 (3.6)	600 (3.9)	595 (3.2)	591 (3.4)	587 (3.5)
ж Jordan	381 (4.6)	380 (5.0)	438 (4.2) ▲	397 (5.7)	392 (4.5) ▲	369 (5.4)	353 (5.0)	339 (6.4)
Kazakhstan	516 (5.6)	517 (5.5)	564 (6.0) ▲	546 (5.8)	533 (6.9)	526 (6.7)	493 (6.2)	491 (6.0)
Korea, Rep. of	594 (2.7)	608 (2.9) ▲	616 (3.1) ▲	608 (3.6)	613 (3.4)	611 (4.3)	599 (2.7)	601 (3.2)
ψ Kuwait	392 (4.5)	398 (7.1)	390 (5.2)	379 (7.6)	390 (4.9)	374 (9.0)	385 (5.2) ▲	369 (7.6)
Lebanon	437 (4.4)	444 (5.0)	468 (3.8)	463 (5.1)	442 (4.3)	445 (6.1)	394 (4.9)	397 (6.1)
2 Lithuania	506 (3.4)	516 (3.8) ▲	502 (3.9) ▲	493 (4.0)	516 (3.9)	513 (4.2)	517 (3.1)	526 (3.5) ▲
Malaysia	474 (3.9)	469 (3.9)	476 (3.8) ▲	458 (3.6)	457 (4.1)	453 (4.3)	456 (4.5) ▲	447 (4.3)
Malta	498 (2.2)	503 (2.1) ▲	498 (1.8) ▲	487 (2.7)	486 (2.4)	482 (2.6)	488 (3.7)	485 (3.3)
ж Morocco	383 (2.4)	382 (2.6)	380 (2.4) ▲	366 (2.8)	407 (3.5)	412 (2.9) ▲	353 (3.1)	354 (3.2)
† New Zealand	496 (3.4)	503 (5.1)	479 (3.4)	470 (4.9)	489 (3.2)	488 (4.8)	511 (3.8)	506 (5.0)
Norway (9)	523 (3.1)	534 (2.9) ▲	470 (3.3)	472 (3.3)	500 (3.2)	495 (2.9)	544 (3.6)	541 (4.1)
ψ Oman	397 (3.4) ▲	382 (3.6)	449 (3.6) ▲	406 (3.8)	430 (3.9) ▲	401 (3.9)	395 (4.5) ▲	359 (4.4)
ψ Qatar	430 (3.4)	440 (4.2)	460 (3.2) ▲	444 (4.6)	441 (3.5) ▲	424 (4.5)	421 (4.1)	413 (6.0)
Russian Federation	523 (5.1)	542 (4.4) ▲	559 (5.7)	558 (5.0)	534 (6.3)	537 (5.5)	500 (5.1)	514 (5.5) ▲
ж Saudi Arabia	351 (5.0)	353 (7.1)	398 (4.8)	384 (7.0)	353 (6.5) ▲	331 (8.1)	370 (5.5)	352 (7.9)
2 Singapore	633 (3.5) ▲	625 (3.8)	630 (3.4) ▲	615 (4.5)	621 (3.7)	613 (4.3)	621 (3.7)	614 (4.2)
Slovenia	516 (2.8)	531 (2.8) ▲	503 (3.5) ▲	494 (2.4)	522 (3.5)	523 (3.4)	525 (3.2)	524 (3.2)
ж South Africa (9)	369 (5.7)	368 (4.6)	400 (5.2) ▲	387 (4.1)	366 (5.3)	362 (4.7)	362 (5.9) ▲	351 (5.0)
Sweden	505 (3.2)	520 (3.2) ▲	482 (3.4)	482 (3.9)	479 (4.5)	477 (3.2)	508 (4.1)	516 (4.2) ▲
Thailand	437 (5.5) ▲	423 (5.8)	441 (5.3) ▲	416 (6.4)	438 (5.2) ▲	419 (6.5)	433 (5.4) ▲	415 (5.7)
Turkey	443 (4.7)	452 (5.2) ▲	469 (4.7) ▲	450 (4.9)	472 (4.8) ▲	454 (5.6)	470 (5.5)	464 (6.2)
United Arab Emirates	464 (3.5)	464 (3.8)	495 (3.5) ▲	475 (3.9)	456 (4.1) ▲	439 (4.2)	455 (4.0)	443 (4.7)
† United States	515 (3.3)	524 (3.2) ▲	529 (3.3) ▲	521 (3.3)	499 (3.5)	501 (3.3)	520 (3.8)	523 (3.7)
International Avg.	478 (0.7)	484 (0.7) ▲	489 (0.7) ▲	478 (0.7)	481 (0.7) ▲	475 (0.8)	475 (0.7) ▲	472 (0.8)
Benchmarking Participants								
† ж Buenos Aires, Argentina	404 (4.6)	425 (5.1) ▲	373 (6.0)	368 (6.4)	357 (5.5)	360 (6.3)	367 (6.7)	379 (8.1)
Ontario, Canada	526 (3.2)	534 (3.6) ▲	508 (3.2)	507 (3.4)	524 (3.3)	524 (4.1)	531 (4.1)	532 (4.3)
‡ Quebec, Canada	549 (3.9)	566 (5.6) ▲	527 (4.3)	535 (5.5)	535 (4.0)	546 (5.7) ▲	540 (4.9)	553 (6.7) ▲
Norway (8)	500 (2.8)	508 (2.5) ▲	424 (3.4)	422 (3.1)	481 (3.5)	474 (2.7)	523 (3.9)	516 (3.3)
Abu Dhabi, UAE	450 (6.0)	435 (7.3)	479 (6.0) ▲	446 (7.3)	443 (6.6) ▲	408 (8.2)	440 (6.9) ▲	412 (8.9)
Dubai, UAE	501 (3.8)	516 (4.4) ▲	531 (3.9)	526 (4.8)	496 (4.3)	496 (5.0)	501 (4.7)	506 (5.1)
1 Florida, US	494 (7.5)	501 (6.8)	505 (8.1)	500 (6.6)	469 (8.0)	470 (6.4)	493 (9.3)	486 (8.1)

▲ Average significantly higher than other gender

ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.11: Achievement in Mathematics Cognitive Domains by Gender

Country	Knowing		Applying		Reasoning	
	Girls	Boys	Girls	Boys	Girls	Boys
Australia	503 (3.5)	515 (4.7) ▲	516 (3.5)	526 (3.5) ▲	519 (3.5)	528 (3.8) ▲
2 Bahrain	460 (1.9) ▲	446 (2.6)	457 (1.8) ▲	443 (2.3)	454 (2.3) ▲	440 (2.6)
† Belgium (Flemish)	550 (3.0)	558 (2.4) ▲	542 (2.4)	546 (2.6)	535 (3.3)	537 (3.2)
Bulgaria	529 (5.4)	526 (5.1)	525 (6.1)	521 (5.4)	524 (7.1)	518 (5.6)
1 2 † Canada	502 (2.5)	509 (2.8) ▲	506 (2.5)	514 (2.5) ▲	515 (2.5)	527 (2.8) ▲
Chile	450 (3.0)	447 (3.6)	461 (2.7)	464 (3.1)	464 (3.4)	467 (3.0)
Chinese Taipei	619 (2.7)	622 (3.1)	591 (2.4)	595 (2.7)	572 (3.6)	579 (3.3) ▲
Croatia	497 (2.1)	508 (2.7) ▲	493 (2.2)	504 (2.5) ▲	497 (2.9)	517 (3.3) ▲
Cyprus	514 (3.1)	524 (3.3) ▲	526 (3.0)	531 (3.8)	516 (4.2)	522 (3.3)
Czech Republic	514 (3.3)	524 (2.6) ▲	523 (3.0)	533 (2.7) ▲	545 (4.0)	542 (3.2)
2 † Denmark	531 (4.4)	541 (3.2) ▲	535 (3.2)	541 (3.1)	545 (4.3)	550 (3.9)
England	548 (3.8)	560 (3.8) ▲	542 (3.9)	547 (3.5)	537 (3.3)	543 (4.2)
Finland	532 (2.9)	528 (2.9)	542 (2.7) ▲	530 (2.4)	547 (3.1) ▲	534 (3.9)
France	482 (3.4)	487 (3.5)	484 (3.5)	492 (3.7) ▲	485 (3.8)	497 (3.8) ▲
1 Georgia	468 (4.5)	464 (4.6)	462 (4.4)	460 (4.8)	454 (4.8)	450 (5.5)
Germany	522 (2.9)	526 (2.9)	513 (2.6)	517 (2.6)	533 (2.8)	536 (2.9)
† Hong Kong SAR	614 (4.8)	621 (3.0)	615 (4.1)	626 (3.3) ▲	595 (4.6)	604 (3.5) ▲
Hungary	530 (3.6)	535 (3.8)	523 (3.4)	529 (4.1)	525 (4.3)	534 (4.3)
Indonesia	401 (4.9) ▲	389 (4.2)	403 (3.8) ▲	392 (3.9)	400 (3.8)	394 (3.9)
Iran, Islamic Rep. of	434 (4.8)	424 (4.6)	440 (4.3)	430 (4.3)	431 (4.5)	422 (5.0)
Ireland	552 (3.6)	556 (3.5)	547 (2.8)	550 (3.0)	532 (3.7)	538 (3.4)
2 Italy	501 (3.2)	520 (4.0) ▲	494 (2.7)	514 (3.1) ▲	491 (3.0)	513 (4.4) ▲
Japan	602 (2.9)	601 (3.2)	590 (2.2)	588 (2.6)	595 (2.8)	595 (4.0)
Jordan	400 (3.4) ▲	380 (5.0)	398 (3.3) ▲	380 (5.0)	395 (4.0) ▲	376 (5.1)
Kazakhstan	547 (4.7)	544 (5.0)	541 (4.8)	540 (5.4)	555 (5.2)	551 (5.0)
Korea, Rep. of	624 (3.1)	630 (3.3) ▲	592 (2.2)	599 (2.6) ▲	612 (3.8)	624 (3.6) ▲
ψ Kuwait	360 (5.5)	349 (5.3)	355 (6.2) ▲	340 (5.4)	340 (5.9) ▲	323 (6.2)
2 Lithuania	533 (3.2)	532 (3.0)	537 (3.2)	536 (3.3)	537 (3.3)	531 (4.1)
Morocco	378 (3.9)	376 (4.3)	375 (4.0)	374 (3.9)	383 (3.8)	375 (4.5)
† Netherlands	515 (2.0)	526 (2.5) ▲	528 (1.8)	533 (2.3) ▲	540 (2.8)	546 (3.6)
New Zealand	471 (3.1)	480 (3.1) ▲	497 (2.8)	497 (3.2)	503 (3.5)	504 (3.5)
‡ Northern Ireland	577 (5.4)	587 (3.9)	576 (4.3)	575 (3.2)	548 (4.6)	551 (3.5)
Norway (5)	545 (3.0)	543 (4.0)	551 (2.7)	549 (3.3)	559 (3.3)	553 (4.6)
Oman	435 (3.1) ▲	410 (3.2)	436 (3.2) ▲	420 (3.1)	428 (3.2) ▲	411 (3.2)
Poland	515 (2.5)	519 (3.0)	540 (2.3)	543 (2.7)	546 (2.5)	547 (3.0)
2 Portugal	540 (3.4)	554 (2.7) ▲	534 (2.7)	545 (2.9) ▲	527 (2.9)	536 (3.2) ▲
Qatar	445 (4.1)	444 (4.9)	435 (4.4)	434 (5.2)	433 (5.7)	429 (5.6)
Russian Federation	557 (4.0)	556 (3.8)	566 (3.9)	567 (3.9)	573 (4.2) ▲	567 (4.3)
ψ Saudi Arabia	398 (5.5) ▲	351 (7.4)	402 (5.1) ▲	362 (6.8)	406 (5.2) ▲	361 (7.0)
3 Serbia	513 (3.7)	512 (4.7)	522 (3.8)	520 (4.3)	517 (4.8)	516 (4.8)
2 Singapore	633 (4.5)	628 (4.1)	621 (4.3)	618 (4.4)	605 (4.9)	600 (4.9)
Slovak Republic	484 (2.8)	497 (2.9) ▲	491 (3.2)	502 (2.9) ▲	509 (3.4)	521 (3.3) ▲
Slovenia	514 (2.8)	520 (2.7)	518 (2.6)	523 (2.6)	522 (2.9)	526 (3.3)
South Africa (5)	387 (3.7) ▲	369 (4.6)	383 (3.6) ▲	371 (4.4)	376 (3.8) ▲	362 (4.5)
2 Spain	498 (3.1)	512 (2.6) ▲	499 (2.6)	511 (2.6) ▲	496 (3.2)	507 (3.2) ▲
2 Sweden	498 (3.7)	503 (3.8)	524 (3.0)	519 (3.0)	545 (3.8)	538 (4.3)
Turkey	490 (3.5)	493 (3.8)	481 (3.6)	484 (3.8)	466 (4.0)	467 (3.8)
United Arab Emirates	455 (4.2)	451 (3.8)	454 (4.1)	451 (3.5)	448 (3.9)	442 (3.3)
2 † United States	545 (2.5)	550 (2.7) ▲	532 (2.4)	542 (2.8) ▲	528 (2.7)	534 (2.9) ▲
International Avg.	504 (0.5)	505 (0.5)	504 (0.5)	505 (0.5)	504 (0.6)	504 (0.6)

▲ Average significantly higher than other gender

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.11: Achievement in Mathematics Cognitive Domains by Gender (Continued)

Country	Knowing		Applying		Reasoning	
	Girls	Boys	Girls	Boys	Girls	Boys
Benchmarking Participants						
Buenos Aires, Argentina	430 (4.1)	434 (2.7)	424 (3.7)	430 (2.9) ▲	436 (4.1)	438 (3.7)
Ontario, Canada	502 (2.9)	508 (2.9)	510 (2.7)	516 (2.8) ▲	519 (2.9)	529 (3.3) ▲
‡ Quebec, Canada	538 (4.1)	546 (5.3)	528 (4.1)	537 (4.8) ▲	529 (4.9)	544 (5.8) ▲
Norway (4)	478 (3.1)	481 (3.3)	492 (2.8)	498 (3.2)	507 (4.2)	506 (3.7)
[2] ψ Abu Dhabi, UAE	420 (8.3)	416 (7.1)	423 (8.1)	421 (6.5)	418 (7.5)	410 (5.9)
Dubai, UAE	513 (3.6)	515 (3.1)	509 (3.5)	512 (3.3)	508 (3.1)	507 (3.2)
[1] Florida, US	555 (5.4)	556 (6.1)	545 (5.0)	544 (5.7)	539 (6.4) ▲	530 (6.8)

▲ Average significantly higher than other gender

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 3.12: Achievement in Mathematics Cognitive Domains by Gender

Country	Knowing		Applying		Reasoning	
	Girls	Boys	Girls	Boys	Girls	Boys
Australia	505 (3.8)	504 (3.4)	500 (3.9)	504 (3.6)	511 (3.8)	513 (3.7)
Bahrain	469 (3.3) ▲	458 (3.1)	453 (2.5) ▲	438 (2.5)	463 (2.8) ▲	442 (3.1)
ψ Botswana (9)	404 (3.3) ▲	382 (3.5)	394 (3.3) ▲	376 (3.4)	396 (2.5) ▲	381 (2.9)
1 † Canada	518 (2.4)	523 (2.8) ▲	526 (2.1)	531 (2.7) ▲	532 (2.3)	536 (2.9)
ψ Chile	414 (3.9)	430 (4.3) ▲	416 (3.7)	436 (4.4) ▲	423 (4.4)	440 (4.2) ▲
Chinese Taipei	598 (3.0)	598 (3.5)	601 (2.5)	603 (3.4)	604 (2.9)	601 (3.5)
ψ Egypt	404 (6.1)	394 (5.3)	386 (5.6)	384 (4.4)	386 (5.8) ▲	370 (5.4)
England	517 (5.2)	509 (4.8)	520 (5.1)	519 (4.8)	524 (5.2)	521 (5.2)
1 2 Georgia	457 (4.5)	455 (4.9)	452 (3.8)	456 (4.5)	443 (4.7)	439 (5.3)
Hong Kong SAR	599 (5.2)	601 (6.5)	593 (4.5)	597 (6.0)	587 (5.2)	595 (6.5)
Hungary	508 (4.5)	514 (4.4)	510 (4.4)	522 (4.1) ▲	512 (4.5)	518 (4.2)
ψ Iran, Islamic Rep. of	437 (5.2)	434 (8.2)	435 (4.7)	434 (7.4)	438 (5.3)	435 (7.7)
Ireland	526 (2.9)	529 (4.2)	517 (2.7)	524 (4.4)	520 (3.4)	523 (4.3)
3 Israel	511 (4.4)	511 (5.1)	509 (4.3)	515 (4.8)	509 (4.7)	510 (5.0)
2 Italy	487 (3.2)	490 (3.1)	492 (3.3)	498 (2.8) ▲	496 (3.3)	503 (3.4)
Japan	579 (3.7)	576 (3.3)	592 (3.3)	591 (3.1)	593 (3.6)	588 (3.5)
ж Jordan	399 (4.2) ▲	382 (5.3)	385 (4.2)	372 (5.3)	393 (4.1) ▲	366 (5.7)
Kazakhstan	539 (6.7) ▲	528 (6.7)	528 (5.9)	526 (5.5)	530 (5.8) ▲	519 (5.9)
Korea, Rep. of	608 (2.9)	606 (3.6)	605 (2.8)	607 (3.7)	606 (3.3)	609 (3.7)
ψ Kuwait	399 (5.0)	396 (7.3)	391 (4.6)	388 (6.8)	379 (6.3)	369 (7.2)
Lebanon	454 (4.1)	458 (4.8)	437 (4.3)	440 (5.0)	406 (5.1)	405 (5.8)
2 Lithuania	502 (3.9)	502 (3.3)	518 (3.1)	521 (3.3)	501 (3.5)	502 (3.6)
Malaysia	482 (4.0) ▲	462 (4.2)	465 (3.9)	461 (4.0)	454 (3.9)	452 (4.2)
Malta	501 (2.3)	497 (1.9)	494 (2.1)	493 (1.8)	486 (2.5)	483 (2.7)
ж Morocco	384 (2.9)	380 (2.8)	385 (2.8)	385 (2.3)	374 (3.3)	374 (3.0)
† New Zealand	487 (3.2)	489 (4.7)	494 (3.1)	492 (4.8)	501 (3.3)	496 (5.0)
Norway (9)	500 (2.7)	501 (2.6)	515 (3.0)	517 (2.5)	515 (3.2)	517 (2.8)
ψ Oman	419 (3.9) ▲	385 (4.0)	413 (3.1) ▲	389 (3.6)	422 (3.5) ▲	385 (4.2)
ψ Qatar	440 (3.2)	440 (5.3)	437 (3.0)	433 (4.6)	441 (3.1) ▲	422 (4.7)
Russian Federation	538 (6.2)	548 (5.5) ▲	535 (5.2)	546 (4.5) ▲	522 (5.6)	533 (5.0) ▲
ж Saudi Arabia	361 (5.9)	358 (7.8)	369 (5.5)	358 (6.3)	389 (5.5) ▲	358 (6.2)
2 Singapore	641 (3.8) ▲	626 (3.9)	623 (3.5) ▲	616 (3.7)	621 (4.4) ▲	612 (4.2)
Slovenia	518 (2.8)	518 (2.8)	512 (2.7)	516 (2.5)	515 (3.0)	516 (3.2)
ж South Africa (9)	377 (5.9) ▲	365 (5.8)	363 (5.5)	361 (4.6)	387 (5.2) ▲	379 (4.1)
Sweden	480 (3.4)	489 (3.4) ▲	503 (3.1)	510 (3.2) ▲	508 (4.3)	511 (3.8)
Thailand	435 (5.6) ▲	415 (6.0)	439 (5.1) ▲	423 (5.4)	443 (5.1) ▲	426 (5.8)
Turkey	450 (5.2)	444 (5.2)	461 (4.5)	458 (4.7)	477 (5.0) ▲	467 (5.1)
United Arab Emirates	482 (3.8)	469 (4.1)	461 (3.7)	453 (4.4)	470 (3.7) ▲	452 (4.2)
† United States	529 (3.7)	527 (3.6)	513 (3.4)	516 (3.4)	512 (3.1)	516 (3.4)
International Avg.	483 (0.7) ▲	479 (0.8)	481 (0.6)	480 (0.7)	482 (0.7) ▲	477 (0.7)
Benchmarking Participants						
† ж Buenos Aires, Argentina	392 (5.1)	402 (5.8)	386 (5.4)	398 (5.8) ▲	379 (5.7)	385 (6.8)
Ontario, Canada	512 (3.2)	514 (3.4)	521 (3.0)	523 (3.3)	534 (3.5)	535 (3.5)
‡ Quebec, Canada	534 (4.0)	548 (5.7) ▲	541 (3.7)	553 (5.4) ▲	532 (3.9)	545 (5.8) ▲
Norway (8)	475 (2.7)	478 (2.9)	492 (2.9)	492 (2.5)	489 (3.1)	486 (3.3)
Abu Dhabi, UAE	467 (6.4) ▲	440 (7.8)	445 (6.5) ▲	422 (7.8)	456 (6.3) ▲	425 (7.6)
Dubai, UAE	520 (4.1)	523 (4.4)	502 (4.0)	509 (4.8)	510 (4.1)	508 (4.8)
1 Florida, US	501 (8.8)	501 (7.0)	488 (7.6)	489 (7.1)	492 (7.4)	490 (6.7)

▲ Average significantly higher than other gender

ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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TIMSS 2015

CHAPTER 4: HOME ENVIRONMENT SUPPORT

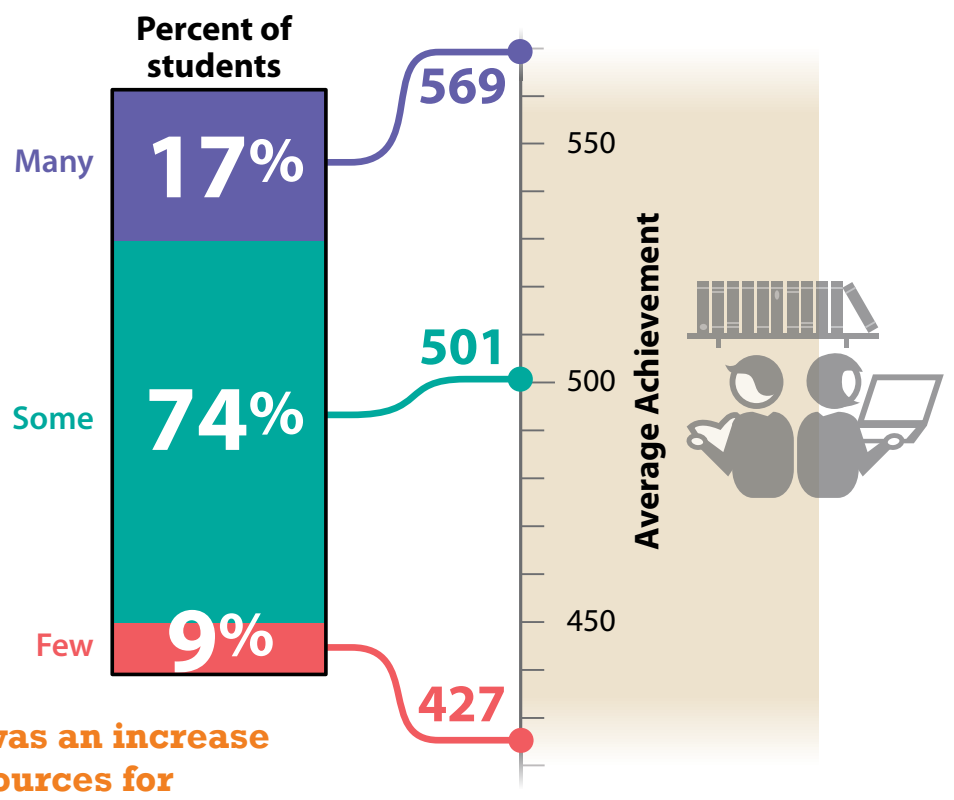
TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Supportive Home Environment for Learning

Home Resources for Learning

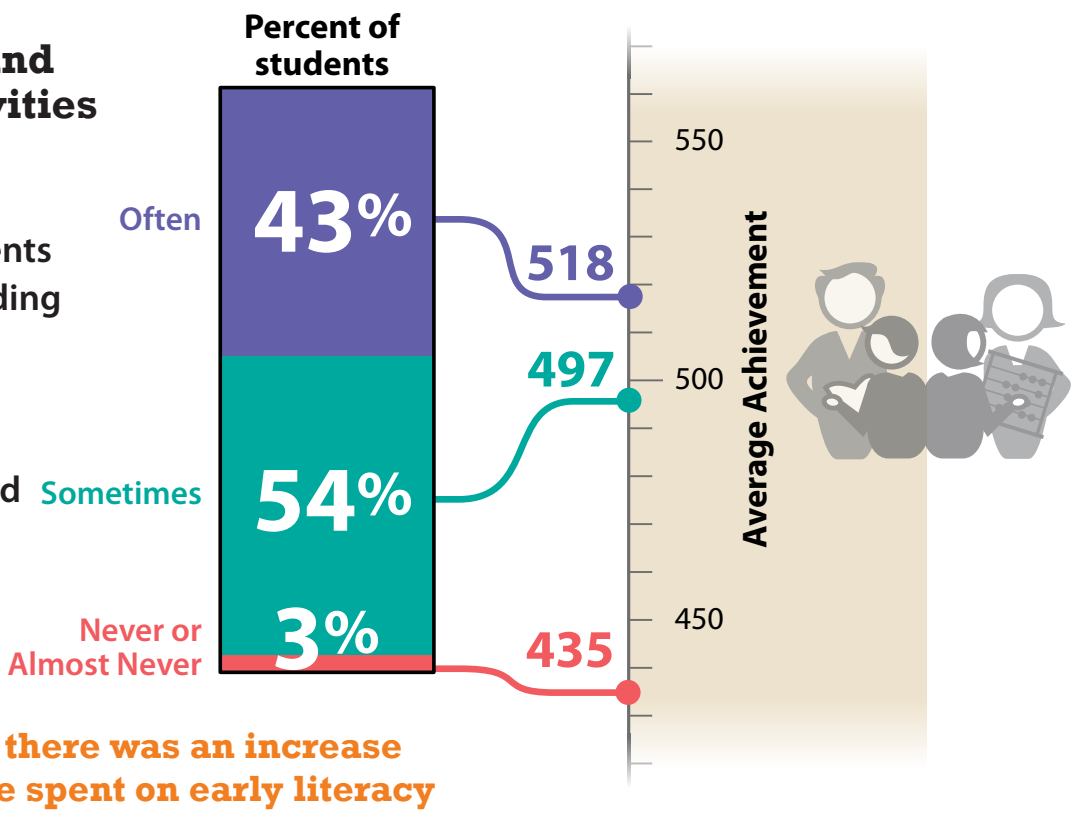
Students whose parents reported many home resources for learning had much higher achievement than students whose parents reported some or few resources.



In 8 countries, there was an increase in students' home resources for learning between 2011 and 2015.

Early Literacy and Numeracy Activities

Students whose parents reported often spending time with them on early literacy and numeracy learning activities had higher achievement.

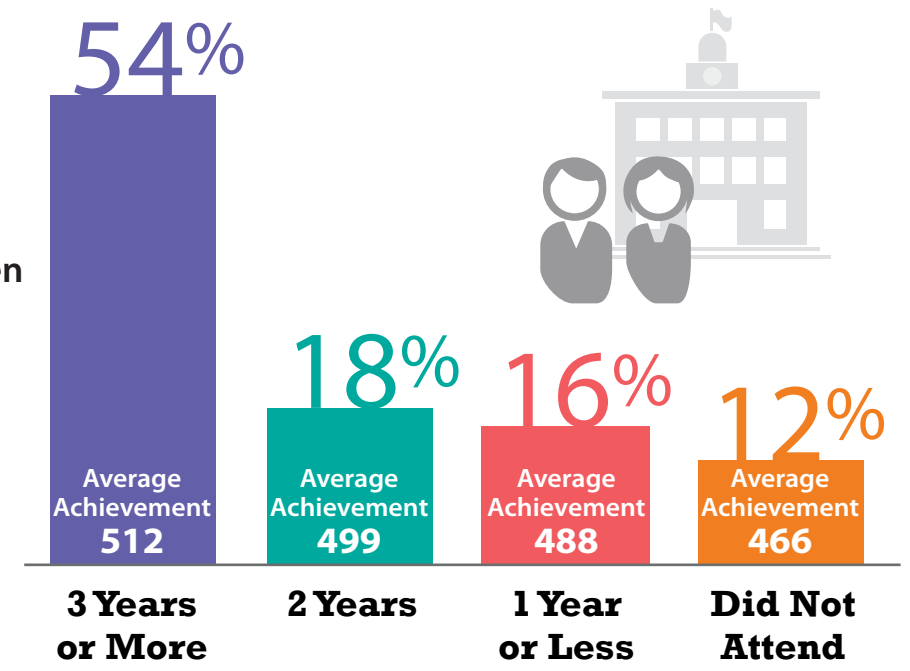


In 14 countries, there was an increase in students' time spent on early literacy and numeracy learning activities.

An Early Start in School

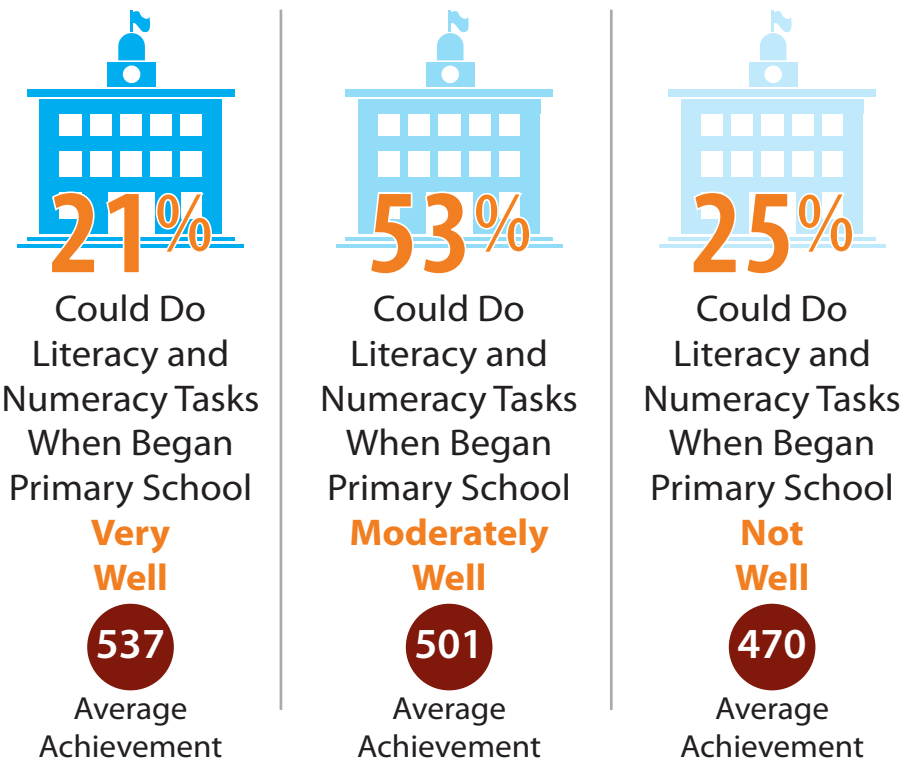
Preprimary Education

There was a positive relationship for fourth grade students between the number of years students attended preprimary education programs and mathematics achievement.



Early Literacy and Numeracy Tasks

Parents' reports on whether students could perform early literacy or numeracy tasks when they began primary school illustrates that early preparation appears to have an effect through the fourth grade.



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

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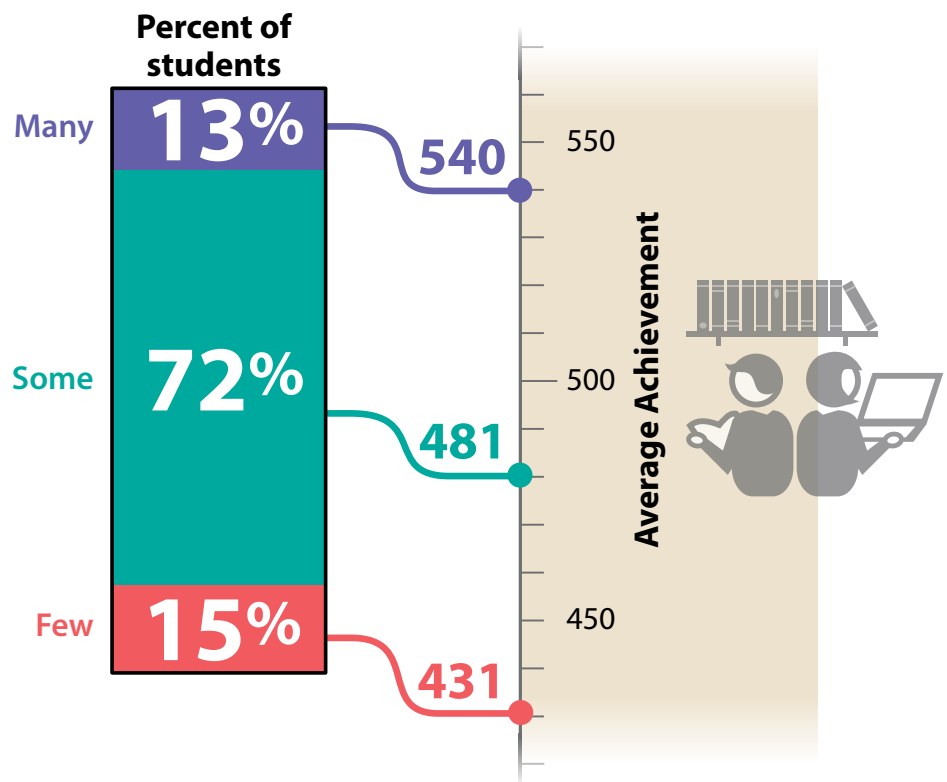
Lynch School of Education, Boston College

Home Educational Resources

Students who reported many home educational resources had much higher achievement than students who reported some or few resources.



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

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Exhibit 4.1: Home Resources for Learning

Reported by Parents, except Number of Books and Home Study Supports Reported by Students

Students were scored according to their own and their parents' responses concerning the availability of five resources on the *Home Resources for Learning* scale. Students with **Many Resources** had a score of at least 11.9, which is the point on the scale corresponding to students reporting they had more than 100 books in the home and both of the home study supports, and parents reporting that they had more than 25 children's books in the home, that at least one parent had finished university, and that at least one parent had a professional occupation, on average. Students with **Few Resources** had a score no higher than 7.4, which is the scale point corresponding to students reporting that they had 25 or fewer books in the home and neither of the home study supports, and parents reporting that they had 10 or fewer children's books in the home, that neither parent had gone beyond upper-secondary education, and that neither parent was a small business owner or had a clerical or professional occupation, on average. All other students were assigned to the **Some Resources** category.

Country	Many Resources		Some Resources		Few Resources		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Korea, Rep. of	50 (1.8)	635 (2.5)	49 (1.8)	584 (2.0)	1 (0.2)	~ ~	11.8 (0.07)	◊ ◊
New Zealand s	41 (1.4)	547 (2.9)	58 (1.4)	490 (3.1)	1 (0.2)	~ ~	11.4 (0.05)	◊ ◊
Sweden r	38 (1.6)	554 (2.6)	60 (1.6)	508 (2.8)	1 (0.3)	~ ~	11.3 (0.07)	r -0.1 (0.09)
Denmark	38 (0.9)	570 (3.3)	61 (0.9)	526 (3.3)	1 (0.2)	~ ~	11.3 (0.04)	◊ ◊
Northern Ireland s	35 (1.4)	632 (3.2)	64 (1.4)	564 (3.9)	1 (0.3)	~ ~	11.1 (0.06)	s 0.2 (0.09)
Finland	34 (1.4)	563 (2.0)	66 (1.4)	525 (2.1)	0 (0.1)	~ ~	11.2 (0.05)	0.0 (0.06)
Ireland	33 (1.5)	587 (2.4)	65 (1.4)	534 (2.2)	2 (0.3)	~ ~	11.0 (0.06)	0.2 (0.09)
Canada r	32 (1.2)	547 (2.4)	68 (1.2)	505 (2.1)	0 (0.1)	~ ~	11.2 (0.05)	◊ ◊
Singapore	27 (0.9)	669 (4.1)	71 (0.9)	605 (3.9)	2 (0.2)	~ ~	10.8 (0.04)	0.2 (0.05) ▲
Belgium (Flemish)	26 (1.1)	581 (2.8)	72 (1.1)	539 (1.9)	3 (0.4)	493 (4.9)	10.8 (0.05)	◊ ◊
Hungary	24 (1.4)	590 (2.7)	69 (1.2)	522 (2.5)	7 (0.8)	413 (7.5)	10.4 (0.08)	0.3 (0.12)
Hong Kong SAR	24 (1.5)	655 (4.7)	69 (1.4)	607 (2.8)	7 (1.0)	581 (5.5)	10.3 (0.08)	0.5 (0.11) ▲
France	23 (1.4)	542 (2.9)	75 (1.3)	479 (2.7)	2 (0.2)	~ ~	10.6 (0.06)	◊ ◊
Poland	22 (0.9)	578 (3.1)	75 (0.9)	526 (2.1)	3 (0.3)	456 (8.3)	10.4 (0.04)	◊ ◊
Slovenia s	21 (1.3)	569 (3.4)	78 (1.3)	519 (2.6)	1 (0.2)	~ ~	10.7 (0.05)	s 0.2 (0.06) ▲
Cyprus	20 (1.0)	567 (4.6)	79 (1.0)	520 (2.4)	1 (0.2)	~ ~	10.6 (0.04)	◊ ◊
Spain r	20 (0.9)	545 (3.1)	76 (0.8)	505 (2.0)	4 (0.5)	437 (8.4)	10.4 (0.05)	r 0.1 (0.08)
Czech Republic	18 (0.9)	579 (2.9)	80 (0.9)	520 (2.1)	2 (0.4)	~ ~	10.5 (0.04)	0.0 (0.06)
Germany s	18 (1.1)	576 (3.4)	80 (1.1)	528 (2.1)	2 (0.4)	~ ~	10.5 (0.06)	s -0.2 (0.09)
Chinese Taipei	17 (0.8)	641 (2.4)	76 (0.8)	592 (2.0)	6 (0.5)	547 (5.4)	10.1 (0.05)	-0.1 (0.08)
Portugal	16 (0.9)	591 (3.3)	77 (1.0)	537 (2.2)	7 (0.6)	496 (6.0)	9.9 (0.05)	0.1 (0.08)
Russian Federation	16 (1.0)	599 (5.0)	83 (1.0)	559 (3.2)	2 (0.3)	~ ~	10.4 (0.05)	0.0 (0.07)
Slovak Republic	15 (0.8)	555 (3.0)	77 (1.1)	498 (2.3)	8 (0.9)	404 (10.6)	10.0 (0.05)	0.1 (0.08)
Georgia	14 (1.0)	509 (6.6)	82 (1.0)	461 (3.6)	4 (0.6)	404 (10.3)	10.1 (0.06)	0.2 (0.09) ▲
Lithuania	13 (0.9)	586 (5.4)	84 (0.9)	535 (2.5)	3 (0.5)	454 (9.3)	10.2 (0.05)	0.3 (0.07) ▲
Bulgaria	12 (1.1)	578 (4.8)	68 (1.9)	529 (3.8)	20 (2.1)	488 (13.3)	9.4 (0.12)	◊ ◊
Japan	12 (0.9)	643 (3.5)	86 (0.9)	588 (1.6)	2 (0.2)	~ ~	10.2 (0.04)	◊ ◊
Qatar r	11 (1.1)	522 (10.9)	86 (1.2)	442 (3.1)	3 (0.4)	382 (9.1)	10.2 (0.05)	r 0.0 (0.07)
United Arab Emirates	11 (0.4)	538 (4.4)	86 (0.4)	452 (2.3)	4 (0.2)	369 (6.0)	10.1 (0.02)	0.2 (0.04) ▲
Croatia	9 (0.7)	547 (3.6)	88 (0.8)	501 (1.6)	3 (0.4)	430 (8.8)	10.0 (0.04)	0.2 (0.06) ▲
Serbia	8 (0.8)	587 (5.1)	87 (1.0)	519 (2.7)	5 (0.8)	428 (17.5)	9.7 (0.06)	◊ ◊
Italy	8 (0.7)	552 (4.4)	85 (0.8)	510 (2.6)	7 (0.6)	465 (6.0)	9.6 (0.05)	-0.1 (0.07)
Bahrain	7 (0.3)	517 (5.2)	88 (0.4)	454 (1.6)	5 (0.2)	412 (7.4)	9.8 (0.01)	◊ ◊
Kazakhstan	7 (1.0)	578 (12.0)	88 (1.0)	543 (4.5)	6 (0.7)	521 (7.7)	9.8 (0.07)	◊ ◊
Chile r	5 (0.5)	535 (6.8)	87 (0.9)	465 (2.4)	8 (0.9)	431 (5.6)	9.3 (0.06)	◊ ◊
Turkey	5 (0.7)	590 (5.9)	63 (1.2)	506 (2.6)	33 (1.3)	432 (5.0)	8.4 (0.07)	◊ ◊
Iran, Islamic Rep. of	4 (0.6)	533 (9.0)	62 (1.7)	453 (3.0)	33 (1.6)	386 (5.1)	8.3 (0.08)	0.2 (0.12)
Oman	3 (0.3)	485 (6.9)	78 (0.7)	436 (2.6)	19 (0.8)	398 (4.4)	8.9 (0.04)	0.2 (0.06) ▲
Kuwait r	3 (0.5)	425 (16.3)	94 (0.5)	359 (4.8)	3 (0.3)	317 (9.1)	9.6 (0.04)	◊ ◊
South Africa (5) r	2 (0.4)	~ ~	65 (1.2)	391 (4.1)	34 (1.2)	348 (3.2)	8.1 (0.05)	◊ ◊
Jordan	2 (0.3)	~ ~	82 (1.1)	405 (2.9)	16 (1.1)	340 (7.2)	8.8 (0.05)	◊ ◊
Saudi Arabia	1 (0.3)	~ ~	84 (1.0)	391 (3.8)	14 (1.0)	371 (8.0)	9.0 (0.05)	0.0 (0.09)
Morocco	1 (0.1)	~ ~	38 (1.4)	400 (4.4)	62 (1.4)	373 (4.8)	6.8 (0.07)	s -0.4 (0.12) ▼
Indonesia	0 (0.1)	~ ~	50 (1.4)	418 (4.1)	49 (1.4)	381 (4.3)	7.6 (0.06)	◊ ◊
Australia	x x	x x	x x	x x	x x	x x	x x	x x
Netherlands	x x	x x	x x	x x	x x	x x	x x	x x
Norway (5)	x x	x x	x x	x x	x x	x x	x x	x x
England	- -	- -	- -	- -	- -	- -	- -	- -
United States	- -	- -	- -	- -	- -	- -	- -	- -
International Avg.	17 (0.2)	569 (0.9)	74 (0.2)	501 (0.4)	9 (0.1)	427 (1.5)		

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.1: Home Resources for Learning (Continued)

Country		Many Resources		Some Resources		Few Resources		Average Scale Score	Difference in Average Scale Score from 2011
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants									
Ontario, Canada	r	34 (1.5)	547 (2.6)	66 (1.5)	504 (2.4)	0 (0.1)	~ ~	11.2 (0.06)	◊ ◊
Quebec, Canada	r	29 (2.4)	568 (4.8)	71 (2.3)	529 (3.7)	0 (0.1)	~ ~	11.0 (0.09)	r -0.1 (0.10)
Dubai, UAE		19 (0.6)	570 (2.9)	79 (0.6)	504 (1.9)	1 (0.2)	~ ~	10.6 (0.02)	0.0 (0.03)
Abu Dhabi, UAE	r	9 (1.1)	514 (14.4)	86 (1.2)	424 (4.3)	5 (0.5)	339 (11.3)	10.0 (0.06)	r 0.2 (0.09)
Buenos Aires, Argentina		x x	x x	x x	x x	x x	x x	x x	x x
Norway (4)		x x	x x	x x	x x	x x	x x	x x	x x
Florida, US		- -	- -	- -	- -	- -	- -	- -	- -

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

Number of books in the home (students):

1) 0-10
2) 11-25
3) 26-100
4) 101-200
5) More than 200

Number of children's books in the home (parents):

1) 0-10
2) 11-25
3) 26-50
4) 51-100
5) More than 100

Number of home study supports (students):

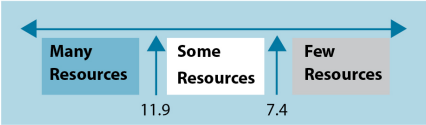
1) None
2) Internet connection or own room
3) Both

Highest level of education of either parent (parents):

1) Finished some primary or lower secondary or did not go to school
2) Finished lower secondary
3) Finished upper secondary
4) Finished post-secondary education
5) Finished university or higher

Highest level of occupation of either parent (parents):

1) Has never worked outside home for pay, general laborer, or semi-professional (skilled agricultural or fishery worker, craft or trade worker, plant or machine operator)
2) Clerical (clerk or service or sales worker)
3) Small business owner
4) Professional (corporate manager or senior official, professional, or technician or associate professional)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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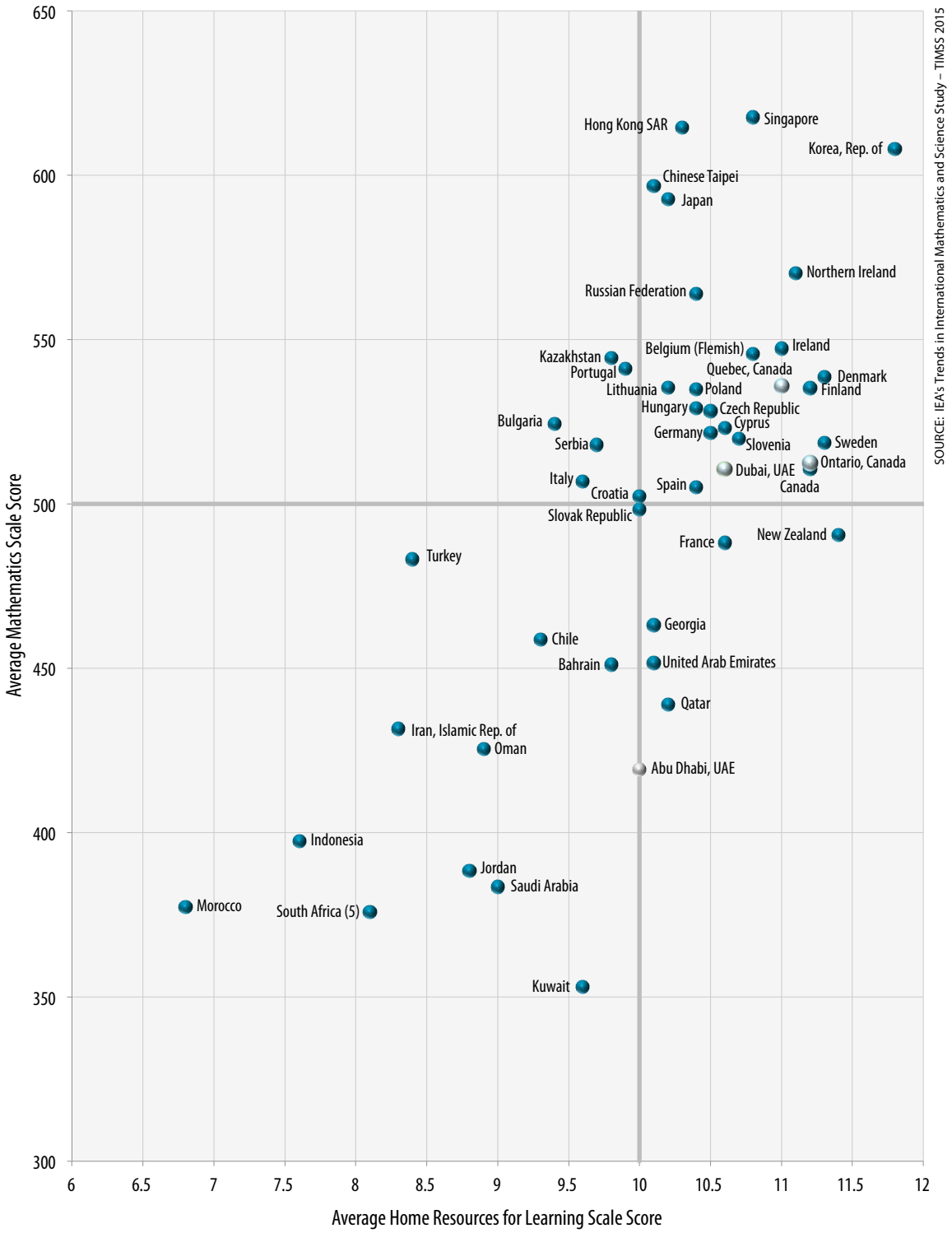
Exhibit 4.1: Home Resources for Learning (Continued)

Average Mathematics Achievement by Home Resources for Learning



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.2: Home Educational Resources

Reported by Students

Students were scored according to their responses concerning the availability of three home educational resources on the *Home Educational Resources* scale. Students with **Many Resources** had a score of at least 12.4, which is the point on the scale corresponding to students reporting that they had more than 100 books in the home, both of the home study supports, and that at least one parent had finished university, on average. Students with **Few Resources** had a score no higher than 8.3, which is the scale point corresponding to students reporting that they had 25 or fewer books in the home, neither of the home study supports, and that neither parent had gone beyond upper-secondary education, on average. All other students were assigned to the **Some Resources** category.

Country	Many Resources		Some Resources		Few Resources		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Korea, Rep. of	37 (1.3)	638 (3.3)	60 (1.2)	589 (2.4)	3 (0.2)	524 (8.1)	11.6 (0.05)	0.3 (0.07) ▲
Norway (9)	29 (1.2)	546 (3.3)	69 (1.1)	499 (2.0)	1 (0.2)	~ ~	11.5 (0.05)	◊ ◊
Georgia	23 (1.1)	492 (4.4)	70 (1.1)	448 (3.9)	7 (0.6)	392 (8.7)	10.9 (0.06)	0.4 (0.08) ▲
Sweden	23 (1.1)	543 (3.2)	74 (1.2)	491 (2.6)	3 (0.5)	449 (9.8)	11.1 (0.04)	-0.2 (0.06) ▼
Australia	23 (0.9)	548 (3.1)	73 (0.9)	497 (3.1)	4 (0.4)	439 (10.6)	11.1 (0.04)	0.0 (0.07)
Hungary	22 (1.5)	590 (4.4)	70 (1.3)	503 (3.0)	7 (0.7)	397 (7.8)	10.8 (0.07)	0.0 (0.09)
United States	22 (0.9)	567 (3.7)	71 (0.9)	509 (2.9)	7 (0.5)	469 (4.7)	10.9 (0.04)	0.0 (0.06)
Canada	21 (0.9)	563 (3.1)	76 (0.8)	520 (2.0)	2 (0.3)	~ ~	11.1 (0.04)	◊ ◊
Ireland	20 (0.9)	567 (3.6)	74 (0.8)	518 (2.5)	6 (0.6)	450 (10.4)	10.9 (0.05)	◊ ◊
Japan	19 (0.9)	638 (3.2)	77 (0.8)	577 (2.1)	4 (0.3)	515 (6.4)	11.0 (0.04)	0.2 (0.06) ▲
England	19 (1.0)	584 (4.7)	76 (1.0)	507 (4.2)	5 (0.4)	462 (7.1)	10.9 (0.05)	0.1 (0.07)
New Zealand	19 (0.7)	550 (3.3)	75 (0.6)	486 (3.2)	6 (0.5)	416 (6.6)	10.9 (0.04)	0.0 (0.07)
Israel r	16 (0.7)	581 (4.5)	82 (0.7)	512 (4.5)	2 (0.3)	~ ~	11.1 (0.04) r	0.1 (0.07)
Chinese Taipei	15 (0.9)	658 (3.7)	73 (0.9)	600 (2.3)	12 (0.6)	521 (4.3)	10.4 (0.04)	0.0 (0.06)
Lithuania	14 (1.1)	564 (5.2)	81 (1.2)	506 (2.5)	5 (0.4)	447 (9.5)	10.7 (0.05)	0.2 (0.06) ▲
Qatar	14 (0.6)	498 (4.3)	78 (0.8)	435 (3.0)	8 (0.5)	362 (6.1)	10.6 (0.03)	-0.1 (0.05)
Slovenia	14 (0.7)	553 (3.6)	83 (0.7)	513 (2.0)	3 (0.4)	455 (8.0)	10.8 (0.04)	-0.1 (0.05)
Malta	13 (0.5)	551 (3.3)	75 (0.7)	494 (1.2)	12 (0.5)	436 (3.9)	10.5 (0.03)	◊ ◊
Italy	13 (0.9)	540 (3.6)	72 (1.0)	497 (2.3)	15 (0.9)	444 (5.5)	10.2 (0.05)	-0.1 (0.07)
Russian Federation	12 (0.6)	567 (5.3)	83 (0.6)	535 (4.8)	5 (0.4)	512 (10.4)	10.7 (0.04)	-0.1 (0.06)
United Arab Emirates	12 (0.4)	519 (4.2)	77 (0.4)	465 (1.9)	11 (0.4)	406 (3.3)	10.4 (0.03)	0.1 (0.04)
Hong Kong SAR	12 (1.0)	634 (5.6)	74 (1.0)	595 (4.4)	15 (0.9)	560 (6.5)	10.2 (0.07)	0.3 (0.08) ▲
Singapore	12 (0.4)	668 (2.7)	77 (0.6)	622 (3.2)	11 (0.5)	565 (5.4)	10.3 (0.03)	0.0 (0.05)
Kazakhstan	11 (1.1)	554 (11.3)	79 (1.1)	528 (4.9)	11 (0.9)	502 (11.3)	10.3 (0.07)	0.3 (0.10) ▲
Iran, Islamic Rep. of	9 (0.8)	514 (8.1)	55 (1.2)	449 (4.9)	36 (1.5)	397 (4.1)	9.3 (0.08)	0.7 (0.12) ▲
Bahrain	8 (0.4)	490 (5.8)	78 (0.7)	456 (1.6)	13 (0.6)	429 (3.8)	10.1 (0.03)	0.0 (0.04)
Lebanon	7 (0.6)	471 (6.7)	73 (1.0)	448 (3.8)	20 (0.9)	418 (4.6)	9.9 (0.04)	0.5 (0.08) ▲
Turkey	7 (0.8)	575 (8.5)	54 (1.2)	476 (4.1)	40 (1.7)	414 (4.6)	9.1 (0.09)	0.7 (0.12) ▲
Chile	6 (0.5)	490 (6.6)	78 (0.9)	432 (3.1)	16 (0.9)	385 (4.8)	9.9 (0.04)	0.2 (0.06)
Oman	6 (0.3)	451 (5.6)	66 (0.8)	409 (2.5)	28 (1.0)	383 (3.5)	9.5 (0.04)	0.5 (0.06) ▲
Saudi Arabia	6 (0.6)	409 (10.5)	69 (1.3)	373 (4.7)	25 (1.4)	346 (5.2)	9.6 (0.06)	0.2 (0.10)
Jordan	5 (0.4)	430 (8.7)	73 (1.0)	395 (3.1)	22 (1.1)	350 (4.1)	9.6 (0.05)	0.1 (0.07)
Kuwait	5 (0.7)	450 (20.8)	82 (1.0)	395 (4.8)	13 (0.8)	360 (4.6)	10.0 (0.05)	◊ ◊
Egypt	5 (0.3)	426 (6.9)	67 (1.0)	404 (4.3)	28 (1.0)	365 (4.9)	9.4 (0.04)	◊ ◊
Malaysia	4 (0.3)	535 (5.2)	72 (1.0)	473 (3.7)	24 (1.0)	431 (4.5)	9.5 (0.04)	0.4 (0.08) ▲
Thailand	3 (0.5)	539 (16.0)	60 (1.1)	440 (5.5)	37 (1.2)	408 (4.3)	9.1 (0.05)	0.6 (0.08) ▲
South Africa (9)	3 (0.4)	477 (20.5)	66 (1.1)	380 (5.2)	31 (1.2)	349 (3.1)	9.1 (0.06)	0.4 (0.07) ▲
Botswana (9)	2 (0.2)	~ ~	51 (1.1)	402 (2.7)	47 (1.2)	379 (2.1)	8.6 (0.05)	0.1 (0.06)
Morocco	2 (0.2)	~ ~	43 (0.9)	396 (3.1)	55 (1.0)	374 (2.0)	8.2 (0.05)	0.2 (0.07)
International Avg.	13 (0.1)	540 (1.3)	72 (0.2)	481 (0.6)	15 (0.1)	431 (1.1)		

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.2: Home Educational Resources (Continued)

Country	Many Resources		Some Resources		Few Resources		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Norway (8)	25 (1.1)	519 (2.7)	74 (1.1)	478 (1.9)	1 (0.2)	~ ~	11.4 (0.05)	-0.2 (0.06) ▼
Ontario, Canada	24 (1.3)	560 (3.9)	74 (1.2)	513 (2.4)	2 (0.3)	~ ~	11.3 (0.05)	-0.1 (0.08)
Dubai, UAE	18 (0.6)	555 (4.4)	77 (0.7)	508 (2.0)	6 (0.5)	439 (7.0)	10.8 (0.03)	0.2 (0.04) ▲
Quebec, Canada	18 (1.0)	580 (4.7)	80 (1.1)	539 (3.5)	3 (0.6)	504 (14.3)	10.9 (0.06)	-0.1 (0.07)
Florida, US	13 (1.4)	558 (8.7)	77 (1.2)	490 (6.2)	10 (1.4)	446 (6.8)	10.4 (0.10)	-0.2 (0.13)
Abu Dhabi, UAE	11 (1.0)	504 (11.3)	77 (1.0)	442 (4.2)	12 (0.8)	387 (5.1)	10.3 (0.06)	0.0 (0.08)
Buenos Aires, Argentina	9 (0.9)	464 (7.3)	72 (1.3)	401 (4.2)	18 (1.3)	340 (5.9)	10.0 (0.07)	◊ ◊

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

Number of books in the home:

1) 0-10
2) 11-25
3) 26-100
4) 101-200
5) More than 200

Number of home study supports:

1) None
2) Internet connection or own room
3) Both

Highest level of education of either parent:

1) Finished some primary or lower secondary or did not go to school
2) Finished lower secondary
3) Finished upper secondary
4) Finished post-secondary education
5) Finished university or higher

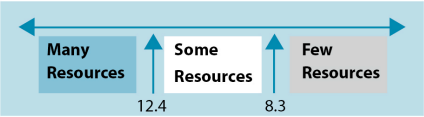

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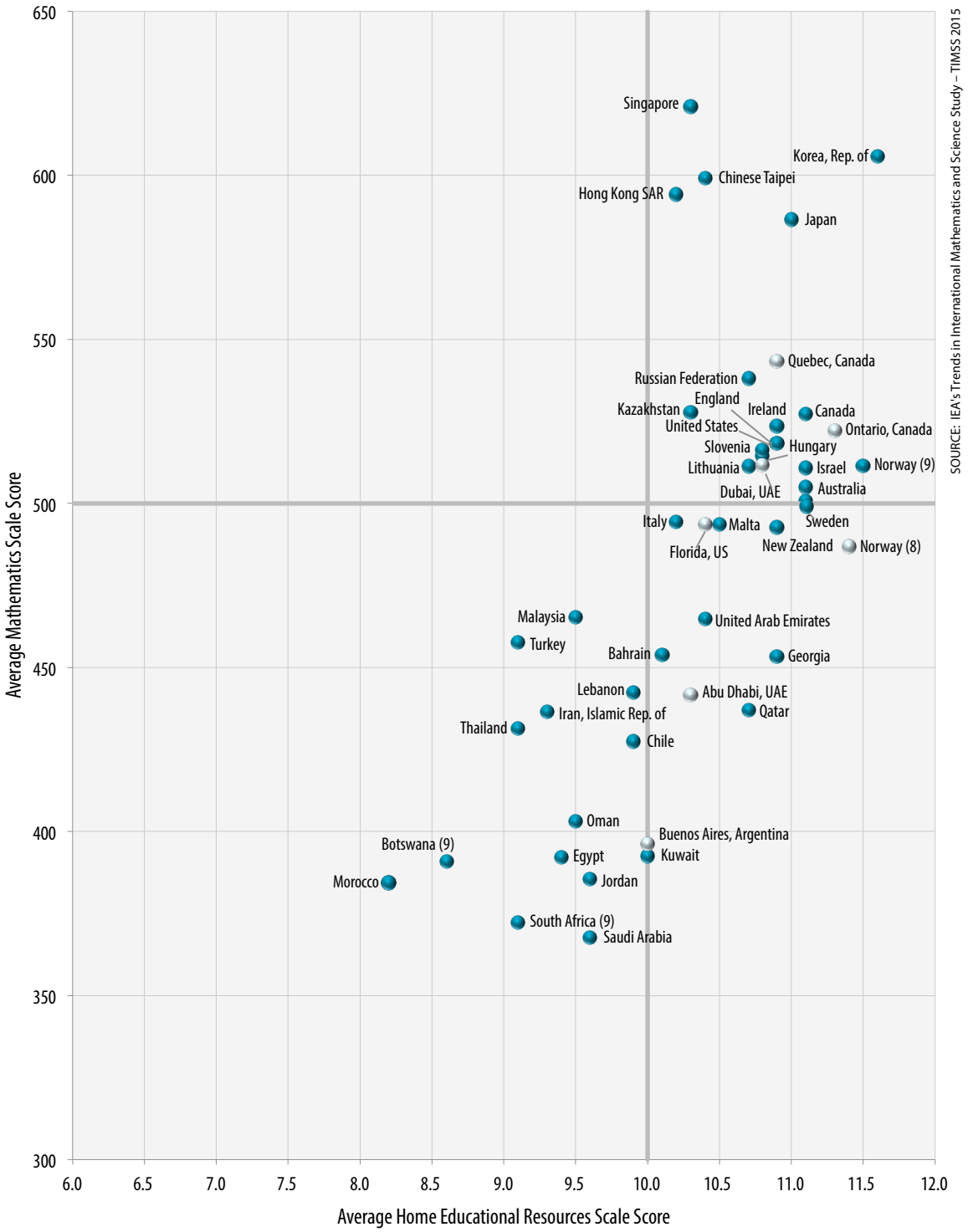
Exhibit 4.2: Home Educational Resources (Continued)

Mathematics Achievement by Home Educational Resources



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.3: Students Speak the Language of the Test at Home

Reported by Students

Country	Always		Almost Always		Sometimes		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	73 (1.3)	516 (3.2)	12 (0.7)	531 (5.3)	14 (1.0)	518 (6.7)	1 (0.2)	~ ~
Bahrain	56 (0.7)	450 (1.6)	12 (0.4)	470 (4.0)	28 (0.6)	457 (2.9)	5 (0.3)	433 (6.4)
Belgium (Flemish)	68 (1.1)	555 (2.2)	10 (0.5)	544 (3.5)	18 (0.9)	519 (3.7)	3 (0.5)	521 (7.8)
Bulgaria	67 (2.3)	535 (4.1)	9 (0.7)	529 (9.7)	18 (1.7)	508 (10.7)	6 (1.0)	466 (14.1)
Canada	58 (1.0)	507 (2.5)	17 (0.5)	533 (2.8)	22 (0.8)	509 (3.9)	3 (0.3)	486 (8.2)
Chile	81 (0.7)	462 (2.5)	9 (0.4)	468 (6.1)	6 (0.4)	458 (5.4)	5 (0.4)	420 (6.5)
Chinese Taipei	43 (1.0)	593 (2.7)	17 (0.6)	616 (3.5)	40 (0.9)	596 (2.6)	1 (0.2)	~ ~
Croatia	80 (0.9)	499 (1.9)	12 (0.6)	523 (4.4)	7 (0.5)	503 (5.8)	1 (0.4)	~ ~
Cyprus	62 (1.4)	524 (2.6)	14 (0.8)	545 (4.8)	21 (0.9)	520 (3.6)	3 (0.4)	496 (8.2)
Czech Republic	77 (0.9)	525 (2.4)	14 (0.8)	548 (3.8)	8 (0.4)	523 (5.3)	1 (0.1)	~ ~
Denmark	70 (1.1)	542 (2.8)	18 (0.8)	547 (4.0)	11 (0.7)	514 (5.7)	1 (0.1)	~ ~
England	72 (1.8)	544 (2.8)	11 (0.7)	572 (6.6)	16 (1.4)	542 (6.5)	2 (0.3)	~ ~
Finland	72 (1.0)	538 (1.9)	17 (0.8)	541 (4.1)	10 (0.7)	514 (6.7)	1 (0.2)	~ ~
France	71 (1.2)	493 (3.0)	12 (0.6)	495 (4.9)	16 (0.8)	466 (4.5)	1 (0.1)	~ ~
Georgia	78 (1.1)	466 (3.6)	9 (0.6)	475 (8.0)	12 (0.8)	465 (5.6)	1 (0.5)	~ ~
Germany r	66 (1.2)	532 (1.9)	14 (0.7)	524 (4.6)	18 (1.0)	503 (4.4)	1 (0.2)	~ ~
Hong Kong SAR	58 (1.7)	615 (3.2)	13 (0.8)	618 (4.7)	28 (1.6)	616 (4.5)	1 (0.3)	~ ~
Hungary	84 (0.7)	532 (3.1)	13 (0.7)	528 (5.6)	2 (0.3)	~ ~	0 (0.1)	~ ~
Indonesia	31 (1.8)	391 (5.1)	12 (0.6)	391 (5.4)	43 (1.7)	413 (4.8)	14 (0.9)	390 (7.0)
Iran, Islamic Rep. of	59 (2.0)	450 (3.7)	8 (0.6)	451 (6.6)	17 (1.1)	433 (5.5)	16 (1.5)	363 (9.4)
Ireland	77 (0.9)	553 (2.4)	11 (0.7)	531 (4.4)	10 (0.7)	538 (5.5)	2 (0.3)	~ ~
Italy	72 (1.1)	511 (2.6)	12 (0.8)	508 (4.2)	14 (0.8)	493 (5.3)	2 (0.3)	~ ~
Japan	91 (0.5)	596 (2.0)	7 (0.5)	576 (4.1)	1 (0.2)	~ ~	0 (0.1)	~ ~
Jordan	88 (1.0)	388 (3.2)	5 (0.6)	416 (12.3)	5 (0.5)	444 (7.0)	1 (0.4)	~ ~
Kazakhstan	78 (1.1)	544 (4.7)	9 (0.6)	553 (6.7)	12 (1.0)	548 (7.2)	1 (0.2)	~ ~
Korea, Rep. of	80 (0.7)	606 (2.3)	12 (0.6)	625 (3.5)	8 (0.5)	606 (5.1)	0 (0.0)	~ ~
Kuwait	17 (1.3)	334 (5.7)	11 (0.6)	359 (7.7)	34 (1.4)	376 (6.6)	37 (1.7)	342 (4.9)
Lithuania	77 (0.9)	534 (2.5)	14 (0.7)	556 (4.0)	9 (0.5)	525 (5.1)	0 (0.1)	~ ~
Morocco	35 (1.7)	361 (4.3)	12 (0.6)	380 (5.4)	25 (1.3)	401 (4.9)	29 (1.8)	387 (6.8)
Netherlands	65 (1.9)	532 (1.9)	15 (0.8)	541 (3.3)	17 (1.2)	512 (3.5)	3 (0.7)	531 (8.2)
New Zealand	69 (1.0)	492 (2.6)	15 (0.6)	500 (4.1)	14 (0.8)	481 (5.0)	2 (0.2)	~ ~
Northern Ireland	84 (1.1)	571 (3.1)	8 (0.6)	597 (7.4)	7 (0.9)	553 (6.2)	1 (0.2)	~ ~
Norway (5)	69 (1.5)	554 (2.8)	16 (0.8)	552 (3.8)	14 (1.1)	525 (6.3)	2 (0.2)	~ ~
Oman	50 (1.5)	432 (3.8)	13 (0.6)	427 (4.3)	24 (1.0)	425 (3.9)	13 (1.1)	416 (5.5)
Poland	83 (0.8)	531 (2.2)	14 (0.6)	558 (3.8)	4 (0.3)	538 (7.5)	0 (0.2)	~ ~
Portugal	84 (0.7)	541 (2.2)	7 (0.4)	561 (5.4)	8 (0.5)	529 (6.3)	1 (0.1)	~ ~
Qatar	41 (1.3)	416 (4.7)	12 (0.5)	453 (5.8)	39 (1.1)	466 (3.7)	8 (0.7)	419 (7.2)
Russian Federation	81 (1.5)	564 (3.3)	9 (0.7)	570 (5.1)	8 (1.0)	564 (8.9)	1 (0.3)	~ ~
Saudi Arabia	67 (1.7)	384 (4.4)	12 (1.1)	381 (6.4)	13 (1.0)	405 (6.4)	8 (0.8)	393 (10.0)
Serbia	87 (1.3)	521 (3.1)	8 (0.8)	540 (5.8)	5 (0.7)	475 (20.1)	0 (0.2)	~ ~
Singapore	28 (0.5)	622 (4.0)	20 (0.5)	640 (3.9)	48 (0.6)	609 (4.3)	4 (0.3)	574 (9.7)
Slovak Republic	70 (1.3)	505 (2.5)	15 (0.6)	519 (3.8)	12 (1.0)	465 (6.4)	3 (0.7)	404 (14.6)
Slovenia	72 (1.2)	524 (1.9)	14 (0.6)	532 (3.8)	11 (0.8)	496 (4.3)	3 (0.4)	466 (13.4)
South Africa (5)	20 (1.5)	414 (9.6)	10 (0.4)	401 (7.2)	56 (1.6)	374 (3.3)	14 (0.9)	317 (6.0)
Spain	60 (1.5)	504 (2.5)	14 (0.7)	528 (4.5)	18 (0.7)	505 (4.1)	9 (0.9)	484 (4.7)
Sweden	65 (1.5)	529 (2.5)	19 (0.8)	520 (3.9)	15 (1.1)	480 (5.8)	1 (0.3)	~ ~
Turkey	77 (1.3)	494 (2.7)	8 (0.5)	509 (5.8)	14 (1.0)	460 (8.0)	1 (0.3)	~ ~
United Arab Emirates	39 (0.8)	431 (3.1)	14 (0.5)	480 (3.6)	40 (0.8)	473 (3.2)	6 (0.3)	426 (5.3)
United States	67 (1.1)	543 (2.2)	12 (0.4)	557 (4.5)	19 (0.9)	525 (4.4)	2 (0.2)	~ ~
International Avg.	66 (0.2)	506 (0.5)	12 (0.1)	517 (0.8)	18 (0.1)	497 (0.9)	5 (0.1)	437 (1.9)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report achievement.
An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.3: Students Speak the Language of the Test at Home (Continued)

Country	Always		Almost Always		Sometimes		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Benchmarking Participants								
Buenos Aires, Argentina	78 (0.9)	435 (2.9)	9 (0.5)	456 (4.6)	12 (0.6)	439 (4.8)	1 (0.2)	~ ~
Ontario, Canada	55 (1.4)	506 (2.4)	19 (0.8)	534 (3.1)	24 (1.1)	515 (4.7)	2 (0.3)	~ ~
Quebec, Canada	60 (2.1)	534 (4.3)	18 (0.9)	551 (5.4)	20 (1.8)	529 (5.6)	3 (0.4)	530 (13.5)
Norway (4)	66 (1.4)	500 (2.2)	17 (0.7)	492 (4.0)	15 (0.9)	477 (4.7)	2 (0.3)	~ ~
Abu Dhabi, UAE	43 (1.9)	392 (5.6)	13 (0.7)	436 (7.9)	37 (1.7)	456 (6.7)	7 (0.6)	407 (8.8)
Dubai, UAE	29 (0.6)	503 (2.4)	19 (0.7)	529 (3.5)	46 (0.8)	516 (2.5)	6 (0.4)	468 (7.0)
Florida, US	61 (3.3)	551 (5.6)	11 (0.9)	566 (7.3)	26 (2.7)	529 (5.6)	2 (0.5)	~ ~

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.4: Students Speak the Language of the Test at Home

Reported by Students

Country	Always		Almost Always		Sometimes		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	82 (1.3)	504 (2.6)	11 (0.8)	514 (5.8)	6 (0.7)	516 (9.7)	1 (0.1)	~ ~
Bahrain	55 (0.7)	444 (2.0)	19 (0.7)	479 (4.2)	21 (0.7)	464 (3.1)	5 (0.4)	437 (6.6)
Botswana (9)	5 (0.3)	383 (7.3)	8 (0.5)	424 (6.3)	79 (0.8)	392 (2.0)	9 (0.5)	361 (5.6)
Canada	66 (1.4)	524 (2.2)	21 (0.8)	536 (2.9)	10 (0.6)	534 (3.8)	3 (0.4)	547 (7.5)
Chile	87 (0.7)	430 (3.3)	8 (0.4)	439 (4.8)	3 (0.4)	367 (9.6)	1 (0.3)	~ ~
Chinese Taipei	57 (1.1)	604 (2.8)	34 (0.8)	610 (3.1)	9 (0.6)	530 (5.8)	0 (0.1)	~ ~
Egypt	64 (1.6)	388 (4.8)	13 (0.8)	414 (5.7)	19 (1.0)	398 (4.4)	4 (0.5)	375 (8.4)
England	85 (1.2)	517 (4.3)	9 (0.8)	536 (6.9)	4 (0.5)	514 (8.7)	1 (0.1)	~ ~
Georgia	84 (1.3)	453 (3.5)	11 (0.7)	478 (7.1)	5 (0.8)	414 (9.8)	1 (0.2)	~ ~
Hong Kong SAR	75 (1.7)	590 (4.2)	9 (0.5)	596 (6.9)	13 (1.4)	617 (7.4)	3 (0.4)	598 (16.1)
Hungary	87 (0.7)	512 (3.8)	11 (0.6)	535 (5.8)	1 (0.2)	~ ~	0 (0.1)	~ ~
Iran, Islamic Rep. of	51 (1.8)	445 (5.7)	16 (0.9)	467 (7.1)	20 (1.2)	412 (5.0)	13 (1.0)	401 (7.5)
Ireland	82 (0.8)	525 (2.9)	7 (0.5)	523 (4.5)	7 (0.5)	505 (6.6)	4 (0.3)	506 (9.1)
Israel	78 (1.0)	512 (4.1)	15 (0.6)	519 (6.4)	6 (0.6)	498 (11.2)	1 (0.2)	~ ~
Italy	71 (1.4)	504 (2.7)	18 (0.9)	487 (3.6)	9 (0.8)	448 (7.0)	2 (0.3)	~ ~
Japan	96 (0.3)	588 (2.3)	3 (0.3)	566 (9.8)	1 (0.1)	~ ~	0 (0.1)	~ ~
Jordan	77 (1.3)	385 (3.3)	11 (0.6)	417 (5.0)	8 (0.7)	369 (5.6)	4 (0.6)	363 (16.7)
Kazakhstan	80 (1.1)	526 (5.3)	13 (0.7)	545 (7.8)	6 (0.6)	522 (14.2)	0 (0.1)	~ ~
Korea, Rep. of	89 (0.5)	605 (2.6)	11 (0.5)	618 (4.6)	0 (0.1)	~ ~	0 (0.0)	~ ~
Kuwait	10 (1.0)	378 (8.7)	10 (0.7)	410 (12.8)	47 (1.5)	402 (5.5)	33 (1.3)	378 (5.2)
Lebanon	10 (0.8)	444 (6.8)	17 (0.7)	456 (4.8)	59 (1.2)	442 (4.3)	14 (0.9)	430 (5.7)
Lithuania	79 (0.9)	510 (3.1)	18 (0.7)	520 (4.6)	3 (0.3)	491 (8.5)	0 (0.1)	~ ~
Malaysia	34 (1.5)	491 (4.5)	22 (0.8)	472 (4.0)	38 (1.4)	443 (5.2)	6 (0.7)	437 (8.0)
Malta	10 (0.5)	511 (5.1)	15 (0.6)	507 (3.8)	55 (0.8)	493 (1.7)	20 (0.5)	479 (3.3)
Morocco	25 (1.1)	369 (3.5)	14 (0.6)	387 (3.6)	46 (1.1)	391 (2.7)	15 (0.9)	389 (3.4)
New Zealand	79 (1.4)	495 (2.9)	14 (0.9)	491 (5.6)	6 (0.6)	476 (10.5)	1 (0.1)	~ ~
Norway (9)	81 (1.2)	516 (2.1)	12 (0.7)	497 (4.8)	5 (0.6)	484 (5.8)	1 (0.2)	~ ~
Oman	49 (1.4)	403 (3.0)	18 (0.7)	413 (4.8)	27 (0.9)	403 (3.6)	7 (0.4)	389 (5.4)
Qatar	50 (0.7)	411 (3.3)	19 (0.8)	470 (4.8)	26 (0.6)	465 (5.1)	4 (0.3)	440 (8.0)
Russian Federation	83 (1.6)	539 (4.4)	12 (0.6)	544 (7.0)	5 (1.3)	512 (27.6)	1 (0.1)	~ ~
Saudi Arabia	64 (1.7)	364 (4.7)	10 (0.6)	396 (7.5)	17 (1.2)	368 (7.6)	10 (1.0)	367 (11.3)
Singapore	33 (0.7)	631 (3.2)	32 (0.7)	630 (3.2)	31 (0.6)	603 (4.3)	4 (0.2)	601 (7.7)
Slovenia	70 (1.3)	524 (2.3)	21 (1.0)	512 (3.1)	7 (0.6)	468 (5.5)	3 (0.4)	474 (9.2)
South Africa (9)	16 (1.2)	409 (7.2)	14 (0.8)	424 (6.9)	63 (1.5)	356 (4.1)	6 (0.4)	325 (5.6)
Sweden	75 (1.5)	508 (2.9)	16 (1.0)	491 (4.5)	7 (0.7)	457 (8.2)	1 (0.2)	~ ~
Thailand	64 (1.9)	441 (5.5)	15 (0.8)	436 (6.3)	19 (1.7)	397 (5.2)	2 (0.2)	~ ~
Turkey	82 (1.6)	468 (4.6)	9 (0.5)	471 (8.2)	8 (1.0)	365 (10.4)	2 (0.5)	~ ~
United Arab Emirates	43 (0.9)	443 (2.7)	21 (0.6)	505 (2.9)	31 (0.8)	473 (3.3)	5 (0.3)	449 (6.2)
United States	74 (1.1)	521 (3.0)	17 (0.6)	518 (4.7)	8 (0.5)	504 (5.5)	1 (0.1)	~ ~
International Avg.	62 (0.2)	482 (0.7)	15 (0.1)	494 (0.9)	19 (0.1)	458 (1.4)	5 (0.1)	437 (1.9)
Benchmarking Participants								
Buenos Aires, Argentina	86 (0.8)	396 (4.4)	10 (0.6)	400 (8.8)	3 (0.4)	363 (14.7)	1 (0.2)	~ ~
Ontario, Canada	67 (1.6)	517 (2.8)	20 (1.1)	536 (4.1)	11 (0.7)	533 (4.9)	2 (0.4)	~ ~
Quebec, Canada	62 (2.6)	545 (3.2)	24 (1.5)	540 (5.2)	10 (1.5)	549 (6.6)	4 (0.9)	556 (12.4)
Norway (8)	80 (1.1)	490 (2.0)	14 (0.8)	478 (4.5)	5 (0.4)	471 (5.1)	1 (0.2)	~ ~
Abu Dhabi, UAE	50 (2.0)	422 (5.2)	17 (1.4)	484 (6.5)	28 (1.5)	456 (7.1)	5 (0.6)	419 (10.8)
Dubai, UAE	33 (0.9)	501 (2.6)	31 (0.8)	534 (3.3)	32 (0.9)	503 (3.2)	4 (0.4)	509 (7.8)
Florida, US	62 (3.6)	495 (6.7)	22 (1.8)	505 (8.7)	14 (1.9)	479 (12.0)	2 (0.5)	~ ~

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report achievement.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.5: Parental Attitude Toward Mathematics and Science

Reported by Parents

Students were scored on the *Parental Attitude Toward Mathematics and Science* scale according to their parents' responses to eight statements about their feelings toward the subjects. Students whose parents have a **Very Positive Attitude** had a score on the scale of at least 9.3, which corresponds to their parents "agreeing a lot" with four of the eight statements and "agreeing a little" with the other four, on average. Students whose parents have a **Less than Positive Attitude** had a score no higher than 5.9, which corresponds to their parents "disagreeing a little" with four of the eight statements and "agreeing a little" with the other four, on average. All other students had parents who have a **Positive Attitude** toward mathematics and science.

Country	Very Positive Attitude		Positive Attitude		Less than Positive Attitude		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Kazakhstan	91 (0.6)	546 (4.6)	9 (0.6)	535 (7.0)	0 (0.1)	~ ~	11.4 (0.04)
Indonesia	89 (1.0)	399 (3.6)	10 (0.9)	396 (6.8)	1 (0.3)	~ ~	11.4 (0.06)
Portugal	87 (0.6)	543 (2.2)	13 (0.6)	538 (4.3)	0 (0.1)	~ ~	10.9 (0.02)
South Africa (5)	87 (0.8)	381 (3.4)	12 (0.8)	368 (6.6)	1 (0.1)	~ ~	11.2 (0.05)
Iran, Islamic Rep. of	85 (0.9)	436 (3.4)	15 (0.8)	415 (6.0)	1 (0.1)	~ ~	10.9 (0.05)
Turkey	82 (0.8)	488 (3.0)	17 (0.7)	473 (5.6)	1 (0.2)	~ ~	10.7 (0.05)
Oman	81 (0.5)	431 (2.7)	18 (0.5)	411 (4.0)	1 (0.1)	~ ~	10.6 (0.03)
Jordan	80 (0.9)	399 (3.2)	19 (0.9)	366 (5.9)	1 (0.2)	~ ~	10.6 (0.04)
Bahrain	80 (0.4)	459 (1.8)	20 (0.4)	435 (3.0)	1 (0.1)	~ ~	10.6 (0.02)
Singapore	79 (0.6)	624 (3.7)	20 (0.5)	603 (4.7)	1 (0.1)	~ ~	10.7 (0.03)
Qatar r	79 (0.9)	454 (3.4)	20 (0.9)	423 (5.1)	1 (0.2)	~ ~	10.6 (0.04)
Kuwait r	78 (0.9)	366 (5.4)	21 (0.9)	337 (3.8)	1 (0.1)	~ ~	10.6 (0.05)
Spain	77 (0.8)	512 (2.3)	22 (0.8)	501 (2.6)	1 (0.2)	~ ~	10.5 (0.03)
Northern Ireland s	77 (1.1)	588 (3.7)	22 (1.1)	577 (5.3)	1 (0.3)	~ ~	10.4 (0.05)
Lithuania	76 (0.8)	542 (2.7)	24 (0.8)	530 (3.9)	0 (0.1)	~ ~	10.3 (0.03)
Ireland	76 (1.0)	555 (2.3)	24 (1.0)	536 (3.1)	1 (0.1)	~ ~	10.5 (0.04)
Chile r	75 (0.7)	467 (2.6)	24 (0.7)	456 (3.5)	1 (0.2)	~ ~	10.4 (0.03)
Cyprus	75 (0.6)	529 (2.6)	24 (0.7)	521 (3.7)	1 (0.2)	~ ~	10.3 (0.02)
Morocco	75 (1.3)	386 (3.4)	22 (1.0)	364 (5.9)	3 (0.5)	342 (16.2)	10.4 (0.08)
Denmark	73 (0.8)	545 (2.7)	26 (0.8)	532 (3.8)	1 (0.2)	~ ~	10.2 (0.03)
United Arab Emirates	72 (0.5)	468 (2.6)	27 (0.4)	423 (3.0)	1 (0.1)	~ ~	10.4 (0.02)
Georgia	71 (1.1)	465 (3.4)	28 (1.1)	462 (5.5)	0 (0.1)	~ ~	10.3 (0.06)
Serbia	71 (1.2)	523 (3.4)	27 (1.1)	512 (6.9)	2 (0.3)	~ ~	10.3 (0.05)
Poland	71 (0.8)	541 (2.3)	29 (0.8)	523 (2.8)	1 (0.1)	~ ~	10.2 (0.04)
Saudi Arabia	70 (1.1)	391 (3.8)	28 (1.1)	377 (6.5)	2 (0.4)	~ ~	10.2 (0.06)
Canada r	70 (1.1)	522 (2.1)	29 (1.0)	510 (2.4)	1 (0.2)	~ ~	10.2 (0.04)
New Zealand s	70 (1.3)	520 (3.0)	28 (1.3)	493 (3.2)	2 (0.2)	~ ~	10.2 (0.05)
Bulgaria	69 (1.5)	532 (4.8)	28 (1.3)	518 (7.2)	3 (0.6)	493 (20.3)	10.1 (0.08)
Russian Federation	68 (1.0)	564 (3.3)	31 (1.0)	565 (4.5)	1 (0.1)	~ ~	10.1 (0.03)
Sweden	65 (1.0)	530 (2.9)	35 (1.0)	513 (3.5)	1 (0.1)	~ ~	9.9 (0.04)
Hungary	60 (1.1)	537 (3.7)	38 (0.9)	521 (3.8)	2 (0.2)	~ ~	9.7 (0.04)
Finland	60 (0.8)	545 (2.3)	38 (0.7)	527 (2.4)	2 (0.3)	~ ~	9.7 (0.04)
Hong Kong SAR	60 (1.2)	623 (3.5)	38 (1.2)	606 (3.2)	2 (0.3)	~ ~	9.7 (0.05)
Italy	52 (0.8)	511 (3.3)	45 (0.8)	508 (2.6)	3 (0.3)	497 (8.9)	9.3 (0.03)
Slovak Republic	51 (0.9)	497 (3.3)	46 (0.9)	505 (2.4)	3 (0.3)	487 (10.1)	9.3 (0.04)
France	50 (1.1)	501 (3.7)	48 (1.1)	482 (2.9)	1 (0.2)	~ ~	9.4 (0.05)
Chinese Taipei	49 (0.8)	605 (2.5)	48 (0.8)	592 (2.4)	4 (0.3)	573 (6.1)	9.2 (0.03)
Czech Republic	48 (0.8)	533 (2.8)	49 (0.8)	526 (2.6)	3 (0.3)	526 (8.6)	9.2 (0.03)
Germany s	46 (1.0)	537 (2.8)	49 (1.1)	530 (2.2)	4 (0.5)	526 (6.2)	9.1 (0.04)
Belgium (Flemish)	42 (0.8)	553 (2.6)	54 (0.8)	547 (2.2)	4 (0.3)	520 (7.1)	8.9 (0.03)
Slovenia s	34 (1.2)	538 (2.9)	63 (1.1)	525 (2.6)	3 (0.4)	510 (9.2)	8.8 (0.04)
Korea, Rep. of	34 (0.8)	625 (2.8)	62 (0.8)	602 (2.2)	5 (0.4)	583 (5.7)	8.7 (0.03)
Croatia	24 (0.8)	506 (3.3)	71 (0.8)	503 (1.6)	5 (0.5)	480 (6.2)	8.2 (0.03)
Japan	14 (0.6)	613 (4.3)	68 (0.7)	595 (2.0)	18 (0.7)	573 (3.1)	7.5 (0.03)
Australia	x x	x x	x x	x x	x x	x x	x x
Netherlands	x x	x x	x x	x x	x x	x x	x x
Norway (5)	x x	x x	x x	x x	x x	x x	x x
England	- -	- -	- -	- -	- -	- -	- -
United States	- -	- -	- -	- -	- -	- -	- -
International Avg.	66 (0.1)	510 (0.5)	32 (0.1)	495 (0.6)	2 (0.0)	509 (2.9)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.
An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.5: Parental Attitude Toward Mathematics and Science (Continued)

Country	Very Positive Attitude		Positive Attitude		Less than Positive Attitude		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	80 (0.6)	519 (1.8)	19 (0.6)	487 (3.2)	1 (0.1)	~ ~	10.7 (0.03)
Ontario, Canada r	75 (2.0)	524 (2.5)	24 (1.8)	505 (3.4)	1 (0.3)	~ ~	10.4 (0.08)
Abu Dhabi, UAE r	67 (1.4)	441 (5.3)	32 (1.4)	393 (5.4)	1 (0.2)	~ ~	10.2 (0.06)
Quebec, Canada r	57 (1.5)	547 (4.4)	42 (1.4)	531 (4.0)	1 (0.3)	~ ~	9.6 (0.06)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x
Norway (4)	x x	x x	x x	x x	x x	x x	x x
Florida, US	- -	- -	- -	- -	- -	- -	- -

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How much do you agree with these statements about mathematics and science?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) Most occupations need skills in math, science, or technology	○	○	○	○
2) Science and technology can help solve the world's problems	○	○	○	○
3) Science explains how things in the world work	○	○	○	○
4) My child needs mathematics to get ahead in the world	○	○	○	○
5) Learning science is for everyone	○	○	○	○
6) Technology makes life easier	○	○	○	○
7) Mathematics is applicable to real life	○	○	○	○
8) Engineering is necessary to design things that are safe and useful	○	○	○	○

Very Positive Attitude — 9.3 — Positive Attitude — 5.9 — Less than Positive Attitude

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Exhibit 4.6: Early Literacy and Numeracy Activities Before Beginning Primary School

Reported by Parents

Students were scored according to their parents' frequency of doing the sixteen activities on the *Early Literacy and Numeracy Activities* scale. Students **Often** engaged in early learning activities had a score on the scale of at least 10.4, which corresponds to their parents "often" doing eight of the sixteen activities with them and "sometimes" doing the other eight, on average. Students **Never or Almost Never** engaged in such activities had a score no higher than 6.5, which corresponds to parents "never or almost never" doing eight of the sixteen activities with them and "sometimes" doing the other eight, on average. All other students had parents who **Sometimes** engaged them in early literacy and numeracy activities.

Country		Often		Sometimes		Never or Almost Never		Average Scale Score	Difference in Average Scale Score from 2011	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement			
Russian Federation		70 (0.8)	568 (3.7)	30 (0.8)	558 (3.6)	1 (0.2)	~ ~	11.3 (0.04)	0.2 (0.07)	▲
Northern Ireland	s	68 (1.3)	592 (3.5)	31 (1.2)	571 (5.5)	0 (0.1)	~ ~	11.5 (0.06)	s 0.2 (0.08)	▲
Kazakhstan		66 (1.3)	551 (4.9)	34 (1.3)	532 (4.6)	0 (0.1)	~ ~	11.1 (0.06)	◊ ◊	
Serbia		62 (1.1)	530 (3.2)	37 (0.9)	504 (4.8)	1 (0.5)	~ ~	10.9 (0.06)	◊ ◊	
Ireland		62 (1.0)	560 (2.2)	38 (1.0)	535 (3.1)	1 (0.2)	~ ~	11.1 (0.05)	0.2 (0.07)	▲
New Zealand	s	61 (1.0)	525 (2.7)	38 (1.0)	492 (3.7)	1 (0.1)	~ ~	11.2 (0.05)	◊ ◊	
Poland		60 (1.0)	541 (2.3)	39 (1.0)	528 (2.8)	0 (0.1)	~ ~	10.9 (0.04)	◊ ◊	
Slovak Republic		60 (0.8)	506 (2.8)	39 (0.8)	493 (3.2)	1 (0.4)	~ ~	10.8 (0.04)	0.0 (0.06)	
Croatia		59 (0.9)	511 (2.0)	41 (0.9)	491 (2.1)	0 (0.1)	~ ~	10.8 (0.03)	0.1 (0.05)	▲
Czech Republic		57 (0.9)	533 (2.3)	43 (0.9)	525 (2.8)	0 (0.1)	~ ~	10.7 (0.03)	0.1 (0.04)	
Hungary		56 (1.0)	538 (3.4)	43 (1.0)	522 (3.8)	1 (0.4)	~ ~	10.6 (0.03)	0.0 (0.06)	
Slovenia	s	56 (1.0)	533 (2.9)	43 (1.0)	524 (2.7)	1 (0.2)	~ ~	10.7 (0.04)	s 0.2 (0.06)	▲
Canada	r	55 (1.2)	525 (2.0)	44 (1.1)	510 (2.8)	1 (0.2)	~ ~	10.7 (0.05)	◊ ◊	
Georgia		53 (1.0)	469 (3.8)	46 (1.0)	460 (4.2)	1 (0.2)	~ ~	10.6 (0.04)	0.4 (0.08)	▲
Italy		51 (1.0)	515 (2.6)	48 (1.0)	504 (3.1)	1 (0.2)	~ ~	10.5 (0.04)	0.1 (0.05)	
Cyprus		50 (0.9)	538 (3.0)	48 (0.8)	513 (2.9)	2 (0.2)	~ ~	10.5 (0.04)	◊ ◊	
Korea, Rep. of		48 (0.9)	625 (2.6)	50 (0.9)	596 (2.4)	2 (0.3)	~ ~	10.4 (0.04)	◊ ◊	
Lithuania		48 (1.1)	547 (2.8)	51 (1.1)	531 (3.2)	1 (0.2)	~ ~	10.3 (0.04)	0.3 (0.05)	▲
Spain		48 (0.9)	520 (2.2)	51 (0.9)	500 (2.6)	1 (0.2)	~ ~	10.3 (0.03)	0.1 (0.05)	▲
Germany	s	46 (0.9)	537 (2.7)	53 (0.9)	529 (2.6)	1 (0.2)	~ ~	10.3 (0.04)	s 0.0 (0.05)	
Bulgaria		44 (1.6)	541 (3.8)	45 (1.1)	520 (5.0)	11 (1.5)	485 (16.9)	9.7 (0.12)	◊ ◊	
Chile	r	44 (1.1)	478 (2.6)	55 (1.1)	454 (2.7)	2 (0.3)	~ ~	10.2 (0.05)	◊ ◊	
Portugal		43 (0.9)	553 (2.4)	55 (0.9)	534 (2.8)	1 (0.2)	~ ~	10.1 (0.03)	0.2 (0.06)	▲
France		41 (1.1)	503 (3.4)	58 (1.1)	484 (2.9)	1 (0.2)	~ ~	10.1 (0.03)	◊ ◊	
Bahrain		40 (0.7)	471 (1.8)	58 (0.7)	443 (2.4)	2 (0.2)	~ ~	10.0 (0.02)	◊ ◊	
United Arab Emirates		38 (0.6)	479 (2.9)	60 (0.6)	441 (2.5)	2 (0.2)	~ ~	9.9 (0.03)	0.2 (0.04)	▲
Denmark		36 (1.0)	552 (3.2)	63 (1.0)	536 (3.2)	1 (0.2)	~ ~	9.9 (0.04)	◊ ◊	
Qatar	r	35 (1.1)	470 (4.3)	62 (1.2)	433 (3.5)	2 (0.2)	~ ~	9.8 (0.04)	r 0.1 (0.06)	
Singapore		35 (0.7)	636 (3.7)	61 (0.7)	611 (4.0)	4 (0.3)	581 (7.8)	9.8 (0.04)	0.2 (0.05)	▲
Jordan		33 (1.0)	417 (4.1)	62 (0.9)	381 (3.2)	5 (1.0)	323 (15.1)	9.6 (0.09)	◊ ◊	
Sweden		32 (0.9)	535 (3.4)	67 (0.9)	519 (2.7)	1 (0.2)	~ ~	9.8 (0.03)	0.1 (0.05)	
Saudi Arabia		32 (1.2)	391 (4.8)	65 (1.1)	384 (4.1)	4 (0.6)	364 (11.3)	9.7 (0.07)	◊ ◊	
Kuwait	r	31 (1.1)	375 (5.5)	66 (1.2)	352 (4.4)	3 (0.3)	311 (13.6)	9.6 (0.04)	◊ ◊	
Finland		29 (0.8)	547 (2.8)	69 (0.9)	533 (1.9)	1 (0.2)	~ ~	9.7 (0.03)	0.1 (0.04)	
Belgium (Flemish)		28 (0.8)	556 (2.3)	69 (0.8)	545 (2.4)	3 (0.2)	538 (7.7)	9.5 (0.03)	◊ ◊	
South Africa (5)		27 (1.0)	415 (6.2)	66 (1.1)	367 (3.3)	7 (0.9)	339 (5.8)	9.3 (0.07)	◊ ◊	
Indonesia		26 (1.2)	418 (4.3)	67 (1.2)	395 (3.9)	7 (1.0)	363 (9.7)	9.2 (0.08)	◊ ◊	
Iran, Islamic Rep. of		25 (1.1)	453 (5.5)	67 (1.1)	432 (3.6)	7 (0.9)	358 (13.7)	9.2 (0.08)	0.2 (0.09)	
Turkey		25 (1.1)	523 (3.7)	64 (1.1)	483 (3.2)	11 (0.9)	400 (6.3)	9.0 (0.07)	◊ ◊	
Oman		24 (0.7)	449 (3.8)	72 (0.7)	421 (2.5)	3 (0.3)	390 (7.3)	9.4 (0.03)	0.3 (0.04)	▲
Chinese Taipei		23 (0.8)	616 (2.8)	69 (0.8)	595 (2.0)	8 (0.6)	561 (4.0)	9.0 (0.05)	0.2 (0.06)	▲
Japan		22 (0.7)	611 (3.1)	72 (0.7)	590 (2.0)	5 (0.3)	570 (5.9)	9.2 (0.03)	◊ ◊	
Hong Kong SAR		21 (0.8)	638 (4.1)	75 (1.0)	612 (2.9)	5 (0.5)	587 (5.7)	9.2 (0.04)	0.3 (0.05)	▲
Morocco		13 (0.7)	401 (4.4)	58 (1.7)	382 (3.9)	29 (2.0)	362 (7.1)	7.7 (0.12)	-0.5 (0.18)	▼
Australia		x x	x x	x x	x x	x x	x x	x x	x x	
Netherlands		x x	x x	x x	x x	x x	x x	x x	x x	
Norway (5)		x x	x x	x x	x x	x x	x x	x x	x x	
England		- -	- -	- -	- -	- -	- -	- -	- -	
United States		- -	- -	- -	- -	- -	- -	- -	- -	
International Avg.		43 (0.1)	518 (0.5)	54 (0.2)	497 (0.5)	3 (0.1)	435 (2.6)			

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates that data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.6: Early Literacy and Numeracy Activities Before Beginning Primary School (Continued)

Country		Often		Sometimes		Never or Almost Never		Average Scale Score	Difference in Average Scale Score from 2011
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants									
Ontario, Canada	r	58 (1.8)	527 (2.4)	41 (1.7)	508 (3.2)	1 (0.2)	~ ~	10.9 (0.08)	◊ ◊
Quebec, Canada	r	47 (1.2)	547 (4.1)	51 (1.2)	534 (4.3)	2 (0.4)	~ ~	10.3 (0.05)	r 0.0 (0.07)
Dubai, UAE		45 (0.7)	533 (1.9)	54 (0.7)	496 (2.3)	1 (0.2)	~ ~	10.2 (0.02)	0.2 (0.04) ▲
Abu Dhabi, UAE		37 (1.0)	448 (6.1)	61 (1.0)	412 (5.1)	2 (0.3)	~ ~	9.9 (0.05)	0.3 (0.07) ▲
Buenos Aires, Argentina		x x	x x	x x	x x	x x	x x	x x	x x
Norway (4)		x x	x x	x x	x x	x x	x x	x x	x x
Florida, US		- -	- -	- -	- -	- -	- -	- -	- -

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

Before your child began primary/elementary school, how often did you or someone else in your home do the following activities with him or her?

	Often	Sometimes	Never or almost never
1) Read books	○	○	○
2) Tell stories	○	○	○
3) Sing songs	○	○	○
4) Play with alphabet toys (e.g., blocks with letters of the alphabet)	○	○	○
5) Talk about things you had done	○	○	○
6) Talk about what you had read	○	○	○
7) Play word games	○	○	○
8) Write letters or words	○	○	○
9) Read aloud signs and labels	○	○	○
10) Say counting rhymes or sing counting songs	○	○	○
11) Play with number toys (e.g., blocks with numbers)	○	○	○
12) Count different things	○	○	○
13) Play games involving shapes (e.g., shape sorting toys, puzzles)	○	○	○
14) Play with building blocks or construction toys	○	○	○
15) Play board or card games	○	○	○
16) Write numbers	○	○	○

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.7: Students Attended Preprimary Education

Policies Reported by National Research Coordinators and Preprimary Attendance Reported by Parents

Country		Country Provides Universal Preprimary Coverage	National Preprimary Curriculum Includes Mathematics and Numeracy Skills	Students Attended Preprimary Education							
				3 Years or More		2 Years		1 Year or Less		Did Not Attend	
				Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Hungary		●	●	93 (0.7)	534 (2.8)	4 (0.6)	479 (11.5)	2 (0.2)	~ ~	0 (0.1)	~ ~
Denmark		●	●	93 (0.5)	543 (2.8)	5 (0.5)	530 (8.5)	2 (0.2)	~ ~	1 (0.1)	~ ~
Italy		●	●	89 (0.6)	512 (2.5)	7 (0.4)	494 (5.4)	2 (0.3)	~ ~	2 (0.3)	~ ~
Sweden		●	●	89 (1.2)	527 (2.5)	5 (0.6)	510 (8.3)	4 (0.6)	503 (9.0)	2 (0.4)	~ ~
Belgium (Flemish)		●	●	88 (0.6)	552 (2.0)	5 (0.4)	531 (6.3)	3 (0.3)	527 (6.9)	3 (0.3)	497 (6.7)
France		●	●	88 (0.7)	495 (2.9)	6 (0.5)	476 (7.8)	4 (0.4)	464 (8.3)	3 (0.3)	472 (8.8)
Korea, Rep. of		●	●	86 (0.7)	610 (2.4)	11 (0.7)	599 (3.8)	2 (0.2)	~ ~	1 (0.2)	~ ~
Slovenia	s	●	●	80 (1.3)	531 (2.3)	9 (0.7)	530 (5.4)	5 (0.6)	503 (8.6)	5 (0.7)	525 (7.4)
Singapore		●	●	80 (0.6)	627 (3.6)	12 (0.5)	589 (5.8)	4 (0.2)	582 (9.0)	4 (0.3)	579 (9.5)
Czech Republic		●	●	78 (0.9)	535 (2.2)	14 (0.8)	516 (3.3)	5 (0.4)	504 (5.1)	3 (0.3)	496 (10.2)
Portugal		●	●	74 (1.0)	550 (2.3)	14 (0.8)	532 (3.6)	7 (0.4)	512 (4.2)	4 (0.4)	504 (6.6)
Slovak Republic		●	●	73 (1.4)	512 (2.4)	12 (0.7)	485 (5.5)	10 (1.0)	471 (11.1)	5 (0.6)	413 (10.1)
Hong Kong SAR		●	●	72 (0.9)	620 (3.0)	5 (0.4)	605 (11.4)	12 (0.5)	612 (4.5)	10 (0.8)	596 (5.3)
Finland		●	●	69 (1.4)	537 (2.5)	12 (0.8)	538 (3.6)	18 (1.0)	541 (3.8)	1 (0.2)	~ ~
Bulgaria		●	●	68 (1.8)	535 (3.7)	10 (1.2)	502 (9.8)	17 (1.1)	510 (12.8)	5 (0.7)	500 (13.8)
Lithuania		●	●	68 (1.2)	549 (2.6)	8 (0.6)	512 (6.5)	20 (1.0)	516 (3.9)	4 (0.4)	520 (8.8)
Germany	s	●	●	66 (1.1)	540 (2.3)	8 (0.6)	521 (4.9)	15 (0.7)	525 (4.6)	10 (0.8)	511 (5.4)
Poland		●	●	63 (1.5)	545 (2.3)	17 (0.8)	521 (3.5)	19 (1.5)	517 (4.1)	0 (0.1)	~ ~
Russian Federation		●	●	59 (1.7)	571 (4.2)	10 (0.5)	560 (4.2)	13 (0.7)	561 (4.1)	19 (1.1)	548 (4.3)
Georgia		●	●	59 (1.5)	468 (3.8)	21 (0.9)	460 (4.9)	10 (0.6)	464 (7.1)	11 (1.2)	446 (9.0)
Croatia		●	●	58 (1.6)	514 (2.1)	10 (0.8)	491 (4.3)	12 (0.8)	487 (4.6)	20 (1.7)	486 (3.7)
Spain	r	●	●	57 (0.9)	521 (2.1)	18 (0.8)	501 (3.7)	13 (0.6)	500 (4.8)	12 (0.5)	482 (4.8)
Cyprus		●	●	57 (1.0)	537 (2.8)	24 (0.8)	517 (3.4)	12 (0.6)	508 (4.5)	8 (0.6)	503 (5.6)
New Zealand	s	●	●	56 (1.2)	518 (3.1)	31 (1.0)	513 (3.4)	8 (0.6)	492 (7.2)	5 (0.5)	478 (10.5)
Chinese Taipei		●	●	52 (1.0)	601 (2.4)	40 (1.0)	596 (2.5)	7 (0.4)	586 (5.4)	1 (0.2)	~ ~
South Africa (5)		●	●	48 (1.3)	390 (4.6)	14 (0.8)	384 (5.6)	28 (1.2)	362 (3.5)	10 (0.6)	353 (4.3)
Kazakhstan		●	●	47 (1.7)	552 (5.6)	12 (1.1)	545 (7.1)	20 (1.1)	542 (5.8)	21 (1.4)	529 (7.0)
Serbia		●	●	46 (1.5)	541 (3.2)	12 (0.8)	517 (5.9)	38 (1.6)	498 (6.7)	4 (0.5)	471 (14.0)
Canada	r	●	●	44 (1.4)	529 (2.3)	25 (0.6)	515 (2.7)	20 (1.1)	505 (3.3)	11 (0.6)	506 (4.0)
Chile	r	●	●	42 (1.1)	471 (2.9)	35 (1.1)	464 (3.5)	15 (0.7)	455 (3.9)	7 (0.6)	444 (5.6)
Bahrain		●	●	34 (0.7)	462 (2.2)	34 (0.6)	460 (2.5)	17 (0.8)	451 (5.1)	15 (0.5)	429 (3.6)
Ireland		●	●	33 (1.0)	560 (2.6)	36 (1.0)	555 (3.0)	25 (0.9)	539 (4.1)	5 (0.5)	517 (7.0)
Morocco		●	●	29 (1.1)	397 (4.5)	21 (0.7)	383 (4.2)	18 (0.9)	360 (4.6)	32 (1.4)	373 (6.7)
United Arab Emirates		●	●	21 (0.4)	477 (3.6)	44 (0.6)	447 (2.7)	21 (0.4)	462 (3.6)	14 (0.5)	438 (3.9)
Qatar	r	●	●	20 (0.8)	463 (6.1)	33 (1.0)	454 (4.1)	25 (0.8)	449 (4.7)	22 (1.2)	417 (5.9)
Kuwait	r	●	●	20 (0.9)	372 (5.8)	40 (1.2)	352 (4.7)	20 (1.1)	367 (6.5)	20 (1.4)	355 (6.0)
Indonesia		●	●	18 (1.1)	410 (5.5)	28 (1.6)	425 (4.2)	26 (1.3)	405 (3.7)	28 (2.2)	360 (5.3)
Iran, Islamic Rep. of		●	●	17 (1.0)	452 (6.0)	14 (0.6)	462 (4.3)	48 (1.4)	432 (3.9)	21 (1.3)	396 (7.2)
Oman		○	n/a	15 (0.5)	441 (5.1)	27 (0.8)	444 (3.4)	29 (0.6)	432 (4.1)	29 (0.9)	400 (3.1)
Jordan		●	●	13 (0.9)	401 (7.0)	21 (1.0)	422 (4.8)	41 (1.3)	401 (3.5)	25 (1.1)	345 (5.1)
Turkey		●	●	11 (0.9)	496 (8.5)	11 (0.7)	523 (6.5)	50 (0.9)	493 (3.2)	28 (1.1)	447 (4.2)
Saudi Arabia		●	●	6 (0.6)	404 (8.4)	18 (1.2)	384 (5.6)	31 (1.4)	388 (4.4)	45 (1.8)	380 (5.6)
Australia		●	●	x x	x x	x x	x x	x x	x x	x x	x x
Netherlands		○	n/a	x x	x x	x x	x x	x x	x x	x x	x x
Norway (5)		●	●	x x	x x	x x	x x	x x	x x	x x	x x
England		●	●	- -	- -	- -	- -	- -	- -	- -	- -
Japan		●	●	- -	- -	- -	- -	- -	- -	- -	- -
Northern Ireland		●	●	- -	- -	- -	- -	- -	- -	- -	- -
United States		Varies by state	n/a	- -	- -	- -	- -	- -	- -	- -	- -
International Avg.				54 (0.2)	510 (0.6)	18 (0.1)	496 (0.9)	17 (0.1)	485 (1.0)	11 (0.1)	462 (1.2)

● Yes
○ No

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.
An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.7: Students Attended Preprimary Education (Continued)

Country		Country Provides Universal Preprimary Coverage	National Preprimary Curriculum Includes Mathematics and Numeracy Skills	Students Attended Preprimary Education							
				3 Years or More		2 Years		1 Year or Less		Did Not Attend	
				Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Benchmarking Participants											
Quebec, Canada	r	●	●	62 (1.6)	544 (4.2)	15 (0.8)	542 (5.5)	17 (1.3)	526 (5.1)	7 (0.9)	531 (7.6)
Ontario, Canada	r	●	●	40 (1.9)	527 (3.0)	29 (1.0)	518 (3.6)	17 (1.9)	514 (3.6)	14 (0.9)	506 (4.6)
Dubai, UAE		●	●	27 (0.6)	521 (2.8)	41 (0.7)	508 (1.9)	21 (0.6)	526 (3.2)	11 (0.5)	493 (4.4)
Abu Dhabi, UAE	r	●	●	19 (1.0)	456 (8.1)	45 (1.2)	412 (5.1)	22 (1.2)	430 (6.8)	14 (0.8)	419 (8.0)
Buenos Aires, Argentina		○	n/a	x x	x x	x x	x x	x x	x x	x x	x x
Norway (4)		●	●	x x	x x	x x	x x	x x	x x	x x	x x
Florida, US		●	●	- -	- -	- -	- -	- -	- -	- -	- -

● Yes
○ No

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.8: Early Preparation for School

Reported by Parents

Country		Attended Preprimary Education Program for Three Years or More and Often Engaged in Early Literacy and Numeracy Activities		Attended Preprimary Education Program for Three Years or More and Sometimes or Never Engaged in Early Literacy and Numeracy Activities		Attended Preprimary Education Program for Less than Three Years and Often Engaged in Early Literacy and Numeracy Activities		Attended Preprimary Education Program for Less than Three Years and Sometimes or Never Engaged in Early Literacy and Numeracy Activities	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Hungary		53 (1.0)	542 (3.2)	41 (0.9)	524 (3.4)	4 (0.4)	489 (14.3)	3 (0.4)	463 (12.5)
Italy		46 (1.0)	517 (2.7)	43 (1.1)	507 (3.2)	5 (0.4)	497 (5.9)	5 (0.4)	480 (6.4)
Slovenia	s	46 (1.1)	536 (3.3)	34 (0.9)	525 (2.8)	10 (0.7)	527 (5.2)	10 (0.9)	516 (5.8)
Slovak Republic		46 (1.0)	513 (2.6)	28 (0.9)	509 (2.9)	14 (0.8)	482 (6.0)	13 (0.9)	450 (8.6)
Czech Republic		44 (0.9)	538 (2.4)	34 (0.9)	530 (2.8)	13 (0.7)	514 (3.3)	10 (0.6)	506 (4.9)
Russian Federation		44 (1.2)	573 (4.7)	16 (0.8)	566 (4.5)	26 (1.2)	560 (3.7)	15 (0.9)	547 (4.1)
Korea, Rep. of		42 (1.0)	626 (2.8)	44 (0.9)	596 (2.6)	6 (0.4)	619 (4.7)	8 (0.5)	582 (4.6)
Poland		39 (1.3)	549 (2.4)	24 (1.0)	539 (3.2)	22 (1.1)	525 (3.6)	15 (0.8)	510 (4.1)
France		37 (1.1)	505 (3.7)	50 (1.1)	487 (2.9)	4 (0.4)	488 (9.3)	8 (0.6)	463 (6.1)
Croatia		36 (1.2)	520 (2.7)	22 (0.9)	504 (2.3)	23 (0.9)	497 (3.6)	19 (1.0)	476 (3.5)
New Zealand	s	36 (1.0)	529 (3.4)	20 (0.8)	498 (4.3)	25 (0.8)	520 (3.6)	19 (0.9)	486 (5.1)
Bulgaria		35 (1.5)	546 (3.5)	33 (1.2)	524 (5.0)	9 (0.7)	525 (9.2)	23 (1.7)	499 (12.0)
Lithuania		34 (1.1)	556 (3.0)	34 (1.1)	543 (3.3)	14 (0.8)	527 (4.4)	18 (0.8)	507 (4.7)
Denmark		34 (1.1)	553 (3.3)	59 (1.1)	537 (3.3)	3 (0.4)	533 (9.8)	4 (0.3)	517 (9.4)
Portugal		33 (1.0)	561 (2.7)	41 (0.8)	541 (2.8)	10 (0.5)	529 (4.2)	16 (0.8)	517 (4.3)
Kazakhstan		33 (1.4)	558 (6.0)	14 (0.7)	540 (6.5)	33 (1.3)	544 (5.7)	20 (1.1)	526 (5.3)
Germany	s	32 (1.0)	543 (2.9)	35 (0.9)	537 (3.1)	14 (0.8)	525 (4.5)	19 (0.8)	515 (3.7)
Georgia		32 (1.1)	473 (4.0)	27 (1.0)	464 (4.6)	21 (1.0)	463 (5.6)	20 (0.9)	452 (5.7)
Serbia		32 (1.3)	545 (3.7)	15 (0.7)	531 (4.1)	30 (1.1)	516 (4.1)	23 (1.2)	481 (8.9)
Cyprus		31 (0.9)	550 (3.2)	25 (0.8)	522 (3.5)	19 (0.7)	521 (3.8)	25 (0.8)	505 (3.5)
Singapore		30 (0.7)	641 (3.6)	50 (0.7)	619 (3.9)	5 (0.3)	608 (7.4)	15 (0.5)	578 (6.1)
Sweden		29 (0.9)	538 (3.2)	60 (1.2)	522 (2.6)	3 (0.4)	514 (10.9)	8 (0.9)	495 (6.4)
Spain	r	29 (0.7)	531 (2.6)	28 (0.8)	510 (3.0)	19 (0.7)	505 (3.4)	24 (0.7)	488 (3.6)
Canada	r	26 (1.1)	534 (2.4)	19 (0.6)	523 (3.4)	29 (0.8)	518 (2.4)	26 (1.4)	500 (3.3)
Belgium (Flemish)		25 (0.8)	560 (2.3)	63 (0.9)	549 (2.3)	3 (0.2)	521 (6.2)	9 (0.6)	521 (5.2)
Ireland		22 (0.8)	569 (3.3)	12 (0.5)	545 (4.9)	40 (1.2)	557 (2.7)	26 (1.0)	530 (3.3)
Chile	r	20 (0.8)	484 (3.3)	23 (0.9)	460 (3.6)	24 (0.8)	474 (3.6)	34 (1.1)	450 (3.5)
Finland		20 (1.0)	548 (3.3)	49 (1.2)	532 (2.6)	10 (0.6)	548 (4.2)	21 (1.0)	535 (3.0)
Bahrain		16 (0.4)	477 (2.8)	18 (0.7)	450 (3.0)	24 (0.6)	469 (2.6)	42 (0.8)	440 (2.8)
Hong Kong SAR		16 (0.6)	643 (4.4)	56 (1.0)	614 (3.1)	5 (0.6)	625 (7.0)	23 (1.0)	601 (4.0)
South Africa (5)	r	15 (0.7)	429 (8.1)	33 (1.1)	376 (4.1)	12 (0.7)	404 (6.1)	40 (1.5)	357 (3.4)
Chinese Taipei		12 (0.6)	618 (3.5)	40 (1.0)	596 (2.5)	10 (0.6)	614 (4.0)	37 (1.0)	588 (2.8)
United Arab Emirates		9 (0.4)	504 (5.0)	12 (0.3)	457 (3.6)	29 (0.4)	472 (2.7)	49 (0.6)	436 (2.7)
Qatar	r	9 (0.6)	482 (8.5)	12 (0.6)	448 (5.9)	27 (1.0)	468 (4.0)	53 (1.1)	430 (3.8)
Kuwait	r	7 (0.4)	384 (7.1)	12 (0.6)	366 (6.2)	24 (1.0)	374 (5.9)	56 (1.2)	349 (4.7)
Indonesia		7 (0.7)	425 (8.6)	12 (0.7)	402 (6.9)	20 (1.0)	416 (4.5)	62 (1.4)	391 (4.0)
Morocco		6 (0.4)	417 (5.4)	23 (0.9)	392 (5.1)	7 (0.5)	394 (5.3)	64 (1.3)	371 (4.4)
Iran, Islamic Rep. of		6 (0.5)	473 (7.9)	12 (0.9)	442 (7.8)	19 (0.9)	447 (6.8)	63 (1.3)	422 (3.7)
Oman		5 (0.4)	456 (6.0)	10 (0.4)	433 (6.4)	19 (0.6)	449 (4.2)	65 (0.8)	419 (2.5)
Jordan		5 (0.6)	411 (9.4)	8 (0.6)	394 (8.0)	28 (0.9)	421 (3.9)	59 (1.1)	376 (3.4)
Turkey		4 (0.5)	525 (8.9)	7 (0.6)	481 (10.2)	21 (0.9)	524 (3.6)	68 (1.4)	470 (3.7)
Saudi Arabia		3 (0.4)	406 (11.3)	3 (0.4)	401 (10.4)	29 (1.1)	389 (4.8)	65 (1.2)	382 (4.2)
Australia		x x	x x	x x	x x	x x	x x	x x	x x
Netherlands		x x	x x	x x	x x	x x	x x	x x	x x
Norway (5)		x x	x x	x x	x x	x x	x x	x x	x x
England		- -	- -	- -	- -	- -	- -	- -	- -
Japan		- -	- -	- -	- -	- -	- -	- -	- -
Northern Ireland		- -	- -	- -	- -	- -	- -	- -	- -
United States		- -	- -	- -	- -	- -	- -	- -	- -
International Avg.		26 (0.1)	521 (0.8)	29 (0.1)	501 (0.7)	17 (0.1)	503 (0.9)	29 (0.2)	479 (0.8)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.
An "x" indicates that data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.8: Early Preparation for School (Continued)

Country		Attended Preprimary Education Program for Three Years or More and Often Engaged in Early Literacy and Numeracy Activities		Attended Preprimary Education Program for Three Years or More and Sometimes or Never Engaged in Early Literacy and Numeracy Activities		Attended Preprimary Education Program for Less than Three Years and Often Engaged in Early Literacy and Numeracy Activities		Attended Preprimary Education Program for Less than Three Years and Sometimes or Never Engaged in Early Literacy and Numeracy Activities	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Benchmarking Participants									
Quebec, Canada	r	30 (1.3)	550 (4.4)	32 (1.2)	540 (5.2)	18 (0.8)	544 (5.5)	20 (1.4)	524 (4.4)
Ontario, Canada	r	25 (1.5)	535 (3.3)	15 (0.8)	512 (4.5)	33 (1.2)	521 (3.1)	27 (2.1)	505 (3.3)
Dubai, UAE		13 (0.4)	546 (3.9)	14 (0.5)	500 (3.4)	32 (0.6)	530 (1.8)	41 (0.7)	495 (2.7)
Abu Dhabi, UAE	r	9 (0.7)	478 (10.1)	11 (0.7)	438 (9.5)	28 (0.9)	439 (5.9)	52 (1.2)	407 (5.0)
Buenos Aires, Argentina		x x	x x	x x	x x	x x	x x	x x	x x
Norway (4)		x x	x x	x x	x x	x x	x x	x x	x x
Florida, US		- -	- -	- -	- -	- -	- -	- -	- -

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.9: Could Do Literacy and Numeracy Tasks When Began Primary School

Reported by Parents

Students were scored according to their parents' responses to how well their children could do *Literacy and Numeracy Tasks* when they began primary school. Students who could do the tasks **Very Well** had a score on the scale of at least 11.5, which corresponds to their parents reporting that the students could do all eleven of the tasks (five of the tasks at the highest level and four at the second highest level as well do simple addition and subtraction), on average. Students doing the tasks **Not Well** had a score no higher than 8.7, which corresponds to their parents reporting that the students could do the eleven tasks at a minimal level (five of the tasks at the second lowest level, four at the second highest level, and could not do simple addition and subtraction), on average. All other students could do the literacy and numeracy tasks **Moderately Well** when they began primary school.

Country		Very Well		Moderately Well		Not Well		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Korea, Rep. of		53 (0.9)	627 (2.4)	43 (0.8)	591 (2.5)	3 (0.3)	539 (7.7)	12.0 (0.04)
Ireland		51 (1.0)	575 (2.5)	43 (1.1)	530 (2.7)	6 (0.5)	489 (6.3)	11.6 (0.04)
Singapore		43 (1.1)	655 (3.4)	51 (1.0)	599 (3.9)	5 (0.4)	521 (7.7)	11.4 (0.05)
Bahrain		42 (0.9)	477 (1.8)	50 (1.0)	440 (2.9)	7 (0.3)	406 (4.7)	11.2 (0.02)
Jordan		34 (0.9)	439 (3.4)	52 (0.9)	378 (3.4)	14 (0.9)	313 (7.8)	10.7 (0.06)
Spain		34 (0.8)	535 (2.4)	53 (0.8)	501 (2.1)	13 (0.7)	473 (4.8)	10.7 (0.04)
Chinese Taipei		33 (0.9)	621 (2.7)	62 (0.9)	588 (2.1)	5 (0.3)	550 (6.3)	11.0 (0.03)
Hong Kong SAR		33 (1.2)	639 (3.4)	62 (1.1)	607 (2.8)	5 (0.4)	571 (7.8)	11.0 (0.04)
United Arab Emirates		31 (0.6)	491 (2.8)	55 (0.6)	447 (2.5)	14 (0.4)	403 (3.9)	10.7 (0.02)
Qatar	r	31 (1.0)	478 (3.9)	55 (0.9)	438 (3.8)	15 (0.8)	408 (7.0)	10.6 (0.04)
Poland		29 (0.9)	564 (2.9)	56 (1.0)	528 (2.2)	15 (0.6)	505 (3.6)	10.5 (0.03)
Japan		28 (0.7)	624 (2.4)	61 (0.9)	589 (2.1)	11 (0.6)	545 (3.7)	10.7 (0.03)
Croatia		28 (0.8)	534 (2.5)	58 (0.9)	495 (2.0)	15 (0.7)	471 (3.7)	10.5 (0.03)
Oman		26 (0.6)	459 (3.2)	59 (0.6)	423 (2.9)	14 (0.5)	383 (4.4)	10.4 (0.03)
Serbia		26 (0.8)	560 (3.6)	58 (1.3)	515 (3.5)	16 (1.3)	462 (10.5)	10.4 (0.05)
Saudi Arabia		25 (1.0)	399 (4.5)	54 (1.1)	386 (4.4)	21 (1.2)	364 (5.8)	10.2 (0.06)
Canada	r	25 (0.9)	550 (2.6)	57 (0.9)	514 (1.8)	19 (0.6)	488 (4.0)	10.3 (0.04)
Kazakhstan		22 (1.2)	567 (6.3)	65 (1.1)	540 (4.4)	13 (0.9)	526 (6.2)	10.4 (0.05)
Finland		22 (0.7)	581 (2.4)	49 (0.8)	539 (2.2)	29 (0.8)	501 (2.8)	9.9 (0.03)
Kuwait	r	21 (1.0)	403 (6.2)	57 (0.7)	357 (4.4)	22 (0.8)	319 (5.0)	10.1 (0.05)
Sweden		21 (0.8)	559 (3.9)	57 (0.9)	522 (2.9)	22 (0.7)	494 (3.8)	10.1 (0.04)
Lithuania		20 (0.8)	583 (3.7)	62 (1.0)	537 (2.4)	17 (0.8)	491 (3.9)	10.2 (0.03)
Indonesia		20 (0.9)	445 (3.9)	60 (1.3)	399 (3.6)	20 (1.8)	353 (5.9)	10.1 (0.08)
Bulgaria		17 (0.8)	562 (4.0)	48 (1.5)	530 (3.9)	34 (1.9)	501 (10.2)	9.4 (0.09)
Chile	r	17 (0.7)	505 (3.6)	59 (0.9)	465 (2.3)	24 (1.0)	432 (3.5)	9.9 (0.04)
Russian Federation		17 (0.9)	601 (4.3)	59 (1.0)	568 (3.8)	24 (1.0)	531 (4.4)	9.9 (0.05)
South Africa (5)		17 (0.7)	422 (5.5)	63 (1.1)	376 (3.5)	20 (1.3)	338 (4.3)	10.0 (0.05)
Turkey		16 (0.9)	512 (4.8)	40 (1.1)	493 (3.2)	44 (1.6)	466 (4.6)	9.1 (0.09)
Morocco		15 (0.9)	428 (4.0)	48 (1.3)	380 (4.0)	36 (1.7)	357 (5.8)	9.1 (0.10)
Cyprus		15 (0.6)	562 (5.1)	59 (0.9)	526 (2.7)	26 (0.9)	505 (3.2)	9.8 (0.03)
Iran, Islamic Rep. of		12 (0.7)	477 (4.4)	54 (1.6)	438 (4.1)	34 (1.7)	408 (5.2)	9.4 (0.08)
Czech Republic		10 (0.4)	570 (4.3)	54 (0.8)	531 (2.4)	35 (0.9)	514 (2.9)	9.4 (0.03)
France		10 (0.6)	519 (5.1)	59 (0.9)	497 (3.1)	31 (0.9)	471 (3.5)	9.5 (0.03)
Georgia		9 (0.6)	497 (5.4)	54 (1.0)	469 (3.9)	36 (1.0)	447 (5.3)	9.3 (0.04)
New Zealand	s	9 (0.6)	557 (6.8)	50 (0.9)	521 (2.5)	41 (1.1)	490 (4.2)	9.2 (0.04)
Portugal		8 (0.8)	574 (5.2)	55 (0.8)	545 (2.5)	37 (1.0)	529 (3.0)	9.3 (0.04)
Hungary		8 (0.5)	578 (5.8)	41 (0.8)	532 (4.2)	52 (0.9)	520 (3.4)	8.8 (0.04)
Slovenia	s	7 (0.6)	574 (7.4)	41 (1.0)	540 (2.6)	52 (0.9)	514 (2.8)	8.8 (0.03)
Italy		7 (0.5)	542 (5.4)	47 (0.9)	513 (3.0)	46 (0.9)	500 (2.9)	9.0 (0.04)
Germany	s	5 (0.5)	559 (7.3)	45 (1.1)	536 (2.7)	50 (1.2)	526 (2.6)	8.9 (0.03)
Denmark		4 (0.4)	580 (6.2)	52 (0.9)	550 (2.8)	43 (1.0)	528 (3.8)	9.0 (0.03)
Slovak Republic		4 (0.4)	541 (10.5)	41 (0.9)	508 (3.2)	55 (1.0)	489 (3.1)	8.6 (0.04)
Belgium (Flemish)		4 (0.3)	554 (5.5)	44 (1.0)	549 (2.5)	52 (1.1)	547 (2.2)	8.7 (0.03)
Australia		x x	x x	x x	x x	x x	x x	x x
Netherlands		x x	x x	x x	x x	x x	x x	x x
Norway (5)		x x	x x	x x	x x	x x	x x	x x
England		- -	- -	- -	- -	- -	- -	- -
Northern Ireland		- -	- -	- -	- -	- -	- -	- -
United States		- -	- -	- -	- -	- -	- -	- -
International Avg.		21 (0.1)	537 (0.7)	53 (0.2)	501 (0.5)	25 (0.2)	470 (0.8)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates that data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 4.9: Could Do Literacy and Numeracy Tasks When Began Primary School (Continued)

Country	Very Well		Moderately Well		Not Well		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	35 (0.9)	538 (2.5)	54 (1.0)	505 (1.8)	11 (0.5)	469 (4.7)	10.8 (0.03)
Ontario, Canada r	31 (1.6)	552 (3.2)	56 (1.6)	512 (2.1)	14 (0.6)	472 (4.5)	10.6 (0.06)
Abu Dhabi, UAE	28 (1.1)	471 (6.3)	55 (1.0)	418 (4.9)	16 (0.9)	367 (6.9)	10.5 (0.05)
Quebec, Canada r	15 (1.0)	573 (6.0)	57 (1.4)	540 (3.7)	28 (1.2)	521 (5.3)	9.7 (0.05)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x
Norway (4)	x x	x x	x x	x x	x x	x x	x x
Florida, US	- -	- -	- -	- -	- -	- -	- -

How well could your child do the following when he/she began the first grade of primary/elementary school?

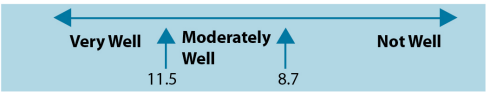
	Very well	Moderately well	Not very well	Not at all
1) Recognize most of the letters of the alphabet	○	○	○	○
2) Read some words	○	○	○	○
3) Read sentences	○	○	○	○
4) Read a story	○	○	○	○
5) Write letters of the alphabet	○	○	○	○
6) Write some words	○	○	○	○

Could your child do the following when he/she began the first grade of primary/elementary school?

	Up to 100 or higher	Up to 20	Up to 10	Not at all
1) Count by himself/herself	○	○	○	○
2) Recognize written numbers	○	○	○	○
3) Write numbers	○	○	○	○

Could your child do the following when he/she began the first grade of primary/elementary school?

	Yes	No
1) Do simple addition	○	○
2) Do simple subtraction	○	○



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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TIMSS 2015

CHAPTER 5: SCHOOL COMPOSITION AND RESOURCES

TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

School Composition and Resources

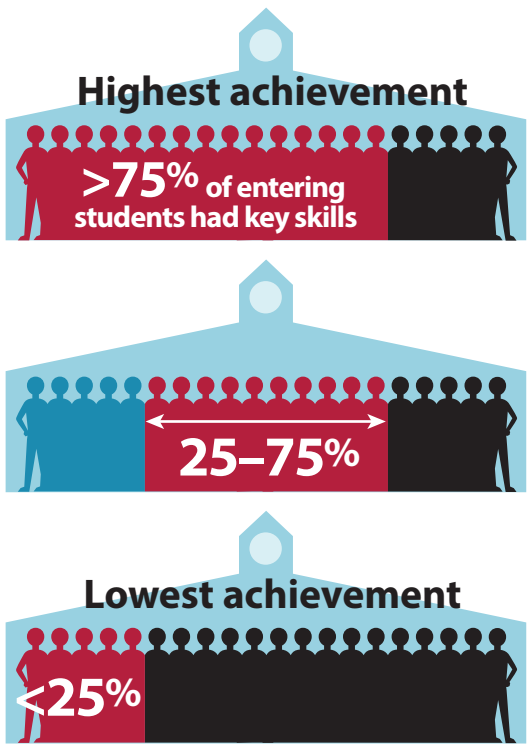
Socioeconomic Composition of Schools

Attended schools with more affluent than disadvantaged students	Attended schools with neither more affluent nor more disadvantaged students	Attended schools with more disadvantaged than affluent students
PERCENT OF STUDENTS: 37%	PERCENT OF STUDENTS: 35%	PERCENT OF STUDENTS: 29%
Average Achievement: 527	Average Achievement: 505	Average Achievement: 483

In nearly all the TIMSS 2015 countries, students attending schools with more affluent than disadvantaged students had higher average mathematics achievement.

Students Do Better in Schools Where Entering Students Had Key Skills

The more students in the school that enter school already able to read and work with numbers, the higher students' mathematics achievement at the fourth grade.



	PERCENT OF STUDENTS	Average Achievement
Highest achievement (>75% of entering students had key skills)	21%	516
25–75%	54%	504
Lowest achievement (<25%)	24%	474

Instruction Affected by Mathematics Resource Shortages – Principals' Reports

Percent of Students Not Affected	Percent of Students Affected	Percent of Students Affected a Lot
27%	69%	4%
519 Average Achievement	502 Average Achievement	466 Average Achievement

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

School Composition and Resources

Socioeconomic Composition of Schools

PERCENT OF STUDENTS 31%
Average Achievement 513
Attended schools with more affluent than disadvantaged students

PERCENT OF STUDENTS 34%
Average Achievement 486
Attended schools with neither more affluent nor more disadvantaged students

PERCENT OF STUDENTS 36%
Average Achievement 457
Attended schools with more disadvantaged than affluent students

In nearly all the TIMSS 2015 countries, students attending schools with more affluent than disadvantaged students had higher average mathematics achievement.

Instruction Affected by Mathematics Resource Shortages – Principals' Reports

Percent of Students Not Affected	Percent of Students Affected	Percent of Students Affected a Lot
27%	66%	6%
506 Average Achievement	476 Average Achievement	448 Average Achievement

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA TIMSS & PIRLS International Study Center
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Exhibit 5.1: School Composition by Economic Background of the Student Body

Reported by Principals

Country		More Affluent - Schools where more than 25% of the student body comes from economically affluent homes and not more than 25% from economically disadvantaged homes		Neither More Affluent Nor More Disadvantaged		More Disadvantaged - Schools where more than 25% of the student body comes from economically disadvantaged homes and not more than 25% from economically affluent homes	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia		35 (3.5)	551 (4.5)	34 (3.7)	519 (4.2)	31 (3.6)	479 (5.6)
Bahrain	r	31 (0.2)	457 (4.8)	45 (0.2)	451 (2.1)	24 (0.2)	442 (2.6)
Belgium (Flemish)		64 (3.5)	557 (2.7)	24 (3.4)	537 (4.2)	11 (2.2)	520 (11.6)
Bulgaria		17 (4.1)	555 (4.9)	48 (5.0)	528 (5.4)	35 (4.4)	507 (12.7)
Canada		42 (3.3)	528 (3.3)	33 (3.4)	507 (3.1)	25 (2.7)	484 (4.9)
Chile	r	14 (2.5)	512 (7.7)	18 (4.0)	475 (6.7)	68 (4.4)	446 (3.8)
Chinese Taipei		13 (2.6)	615 (4.0)	72 (3.5)	598 (2.1)	15 (2.4)	572 (5.1)
Croatia		35 (3.4)	508 (3.0)	46 (3.8)	505 (2.9)	18 (3.3)	485 (3.9)
Cyprus		39 (4.7)	536 (3.8)	45 (4.7)	522 (4.0)	15 (3.0)	498 (5.9)
Czech Republic		38 (4.3)	540 (3.8)	44 (4.4)	527 (2.9)	18 (3.3)	504 (7.1)
Denmark	s	63 (4.5)	549 (3.8)	30 (4.5)	533 (4.8)	7 (2.2)	523 (11.3)
England		31 (3.2)	569 (6.1)	32 (3.8)	550 (6.3)	37 (3.7)	522 (4.5)
Finland		34 (3.9)	537 (4.3)	59 (4.4)	537 (2.4)	7 (2.2)	524 (8.1)
France	r	34 (3.9)	511 (4.8)	34 (4.4)	492 (3.8)	32 (4.6)	459 (5.2)
Georgia		26 (3.5)	491 (9.4)	23 (4.0)	463 (7.7)	51 (4.4)	449 (5.6)
Germany	r	24 (2.8)	539 (3.3)	43 (3.8)	525 (3.2)	33 (3.3)	500 (5.0)
Hong Kong SAR		39 (3.6)	638 (4.9)	30 (3.8)	608 (4.7)	31 (4.0)	593 (6.3)
Hungary		27 (3.2)	564 (4.0)	33 (4.0)	544 (4.4)	40 (3.9)	494 (5.7)
Indonesia	r	16 (2.6)	433 (9.6)	32 (3.3)	405 (7.0)	52 (3.2)	387 (5.1)
Iran, Islamic Rep. of		14 (2.9)	465 (12.0)	44 (3.5)	445 (6.9)	42 (3.6)	405 (6.1)
Ireland		36 (4.2)	566 (3.7)	43 (4.7)	544 (3.0)	21 (2.9)	523 (5.0)
Italy		36 (4.2)	519 (4.0)	50 (4.7)	508 (4.1)	14 (2.9)	489 (6.9)
Japan		55 (4.4)	600 (2.7)	37 (4.2)	588 (2.5)	8 (2.3)	576 (4.8)
Jordan	r	14 (3.0)	434 (11.3)	25 (3.7)	389 (6.8)	61 (3.4)	377 (5.5)
Kazakhstan		69 (3.6)	553 (6.1)	25 (3.6)	535 (9.2)	6 (1.9)	513 (22.0)
Korea, Rep. of		29 (3.7)	630 (4.0)	51 (3.9)	605 (2.7)	21 (3.1)	584 (3.9)
Kuwait	r	23 (5.2)	389 (13.0)	40 (5.5)	348 (7.8)	37 (5.9)	342 (9.0)
Lithuania		55 (3.3)	546 (2.9)	29 (3.5)	527 (6.6)	16 (2.7)	513 (7.6)
Morocco	r	13 (1.9)	442 (8.9)	8 (1.9)	366 (10.6)	79 (2.8)	365 (4.5)
Netherlands	s	72 (4.5)	538 (2.4)	23 (4.5)	531 (3.4)	6 (2.8)	516 (4.5)
New Zealand		47 (3.2)	521 (3.7)	26 (3.5)	491 (4.6)	27 (2.7)	442 (6.8)
Northern Ireland	r	46 (5.1)	590 (4.4)	18 (4.2)	568 (9.4)	37 (3.8)	553 (6.6)
Norway (5)		59 (4.3)	554 (3.2)	34 (4.3)	546 (4.5)	7 (2.6)	513 (10.3)
Oman		35 (2.9)	426 (5.8)	42 (3.0)	430 (4.4)	23 (2.6)	419 (7.0)
Poland		17 (3.3)	548 (6.5)	57 (4.3)	538 (2.9)	25 (3.8)	514 (4.7)
Portugal		19 (2.9)	566 (5.9)	35 (4.3)	539 (4.3)	46 (3.9)	536 (3.7)
Qatar	r	72 (2.8)	447 (5.0)	16 (2.7)	411 (9.6)	12 (2.0)	436 (9.1)
Russian Federation		72 (3.6)	565 (3.1)	24 (3.8)	568 (10.9)	4 (1.2)	546 (16.1)
Saudi Arabia	r	46 (4.7)	400 (6.7)	36 (4.1)	365 (6.4)	19 (3.7)	369 (13.3)
Serbia		20 (3.3)	539 (5.6)	36 (4.5)	516 (5.3)	44 (4.6)	509 (6.9)
Singapore		44 (0.0)	633 (5.0)	46 (0.0)	614 (6.5)	10 (0.0)	576 (13.4)
Slovak Republic		31 (3.0)	515 (3.1)	48 (3.2)	508 (3.0)	21 (2.4)	448 (5.1)
Slovenia		35 (4.2)	523 (3.6)	41 (4.5)	521 (2.7)	23 (3.4)	516 (3.1)
South Africa (5)		9 (1.8)	531 (10.5)	15 (2.4)	370 (10.8)	77 (2.8)	366 (4.7)
Spain		46 (3.8)	518 (2.9)	34 (3.5)	506 (3.8)	20 (3.2)	477 (6.4)
Sweden		71 (4.3)	530 (3.1)	19 (3.6)	503 (5.6)	11 (3.0)	483 (14.3)
Turkey		22 (3.0)	519 (8.4)	27 (2.9)	499 (7.5)	51 (3.2)	459 (4.1)
United Arab Emirates	r	50 (1.9)	466 (4.3)	23 (1.9)	465 (7.0)	27 (1.8)	399 (4.4)
United States		19 (2.1)	585 (5.6)	23 (2.6)	555 (4.5)	59 (2.3)	519 (3.4)
International Avg.		37 (0.5)	527 (0.8)	35 (0.5)	505 (0.8)	29 (0.5)	483 (1.1)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.1: School Composition by Economic Background of the Student Body (Continued)

Country		More Affluent - Schools where more than 25% of the student body comes from economically affluent homes and not more than 25% from economically disadvantaged homes		Neither More Affluent Nor More Disadvantaged		More Disadvantaged - Schools where more than 25% of the student body comes from economically disadvantaged homes and not more than 25% from economically affluent homes	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Benchmarking Participants							
Buenos Aires, Argentina	s	50 (6.2)	456 (5.2)	15 (3.7)	417 (9.2)	35 (6.2)	402 (8.9)
Ontario, Canada		37 (5.5)	520 (3.9)	32 (5.1)	517 (4.0)	31 (4.1)	497 (4.3)
Quebec, Canada		63 (5.7)	549 (4.3)	23 (5.4)	523 (5.1)	15 (4.6)	509 (9.2)
Norway (4)		59 (4.5)	501 (2.8)	36 (4.8)	486 (3.6)	5 (2.2)	457 (20.7)
Abu Dhabi, UAE	r	47 (5.0)	427 (11.9)	19 (4.1)	424 (22.8)	35 (3.9)	381 (8.4)
Dubai, UAE	r	61 (0.3)	524 (1.6)	26 (0.3)	521 (3.5)	13 (0.1)	419 (3.5)
Florida, US	r	13 (4.3)	582 (10.0)	19 (6.2)	575 (11.1)	67 (5.8)	532 (6.3)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Approximately what percentage of students in your school have the following backgrounds?

	0 to 10%	11 to 25%	26 to 50%	More than 50%
1) Come from economically disadvantaged homes ----------	○	○	○	○
2) Come from economically affluent homes ----------	○	○	○	○

More Affluent - Schools where more than 25% of the student body comes from economically affluent homes and not more than 25% from economically disadvantaged homes

More Disadvantaged - Schools where more than 25% of the student body comes from economically disadvantaged homes and not more than 25% from economically affluent homes

Neither More Affluent nor More Disadvantaged - All other possible response combinations

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Exhibit 5.2: School Composition by Economic Background of the Student Body

Reported by Principals

Country		More Affluent - Schools where more than 25% of the student body comes from economically affluent homes and not more than 25% from economically disadvantaged homes		Neither More Affluent Nor More Disadvantaged		More Disadvantaged - Schools where more than 25% of the student body comes from economically disadvantaged homes and not more than 25% from economically affluent homes	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia		30 (3.6)	545 (4.8)	39 (4.1)	504 (4.2)	30 (3.6)	474 (6.3)
Bahrain		31 (0.3)	480 (3.6)	47 (0.3)	445 (2.1)	22 (0.2)	446 (3.3)
Botswana (9)		10 (2.7)	432 (7.1)	25 (4.6)	401 (5.1)	65 (4.8)	381 (3.2)
Canada		43 (3.9)	541 (3.0)	32 (3.6)	524 (4.3)	25 (3.1)	512 (4.9)
Chile	r	14 (2.5)	490 (9.4)	18 (4.0)	457 (12.0)	68 (4.0)	409 (5.1)
Chinese Taipei		18 (2.6)	630 (10.0)	69 (3.3)	601 (2.9)	13 (2.3)	549 (5.9)
Egypt	r	18 (3.3)	409 (11.7)	32 (3.9)	400 (7.9)	49 (4.1)	379 (6.5)
England	r	33 (3.6)	576 (7.4)	38 (4.4)	515 (7.8)	29 (3.8)	487 (7.8)
Georgia		20 (3.4)	470 (7.7)	29 (4.5)	453 (6.7)	51 (4.5)	445 (5.6)
Hong Kong SAR		19 (3.2)	630 (8.7)	35 (4.1)	604 (8.0)	46 (4.2)	562 (6.6)
Hungary		23 (3.3)	562 (7.2)	36 (4.3)	530 (6.3)	41 (3.9)	470 (6.4)
Iran, Islamic Rep. of		22 (2.7)	483 (10.0)	23 (2.9)	461 (8.9)	55 (2.6)	409 (4.4)
Ireland		27 (4.1)	546 (4.4)	39 (4.6)	533 (3.3)	34 (4.0)	500 (4.6)
Israel		24 (3.3)	560 (8.4)	34 (3.4)	529 (6.5)	43 (3.2)	471 (8.0)
Italy		36 (4.0)	502 (6.2)	46 (4.7)	496 (4.5)	18 (3.9)	475 (7.9)
Japan		44 (3.6)	604 (4.2)	46 (3.9)	577 (3.2)	10 (2.5)	558 (6.0)
Jordan	r	15 (2.5)	414 (9.8)	21 (3.4)	401 (8.2)	65 (3.8)	370 (4.6)
Kazakhstan		65 (3.8)	536 (7.4)	29 (3.6)	519 (8.3)	5 (1.8)	504 (30.8)
Korea, Rep. of		14 (2.8)	643 (6.7)	56 (4.4)	607 (3.2)	30 (3.7)	587 (3.4)
Kuwait	r	17 (3.2)	433 (21.8)	38 (3.8)	386 (6.8)	45 (4.6)	383 (6.6)
Lebanon	r	19 (3.9)	452 (11.9)	29 (4.1)	470 (6.9)	53 (4.5)	426 (6.3)
Lithuania		50 (3.6)	528 (4.2)	34 (3.6)	499 (4.4)	15 (2.9)	484 (6.4)
Malaysia		6 (1.2)	546 (8.4)	26 (3.5)	478 (9.4)	68 (3.4)	451 (4.3)
Malta		32 (0.1)	508 (1.8)	64 (0.1)	489 (1.4)	5 (0.1)	432 (4.1)
Morocco	r	7 (1.6)	438 (12.2)	12 (2.2)	395 (11.0)	81 (2.4)	377 (2.4)
New Zealand		30 (4.7)	529 (5.0)	42 (4.9)	493 (4.6)	28 (2.3)	449 (5.8)
Norway (9)		57 (4.5)	519 (3.2)	35 (4.1)	504 (3.5)	8 (2.2)	493 (4.1)
Oman		37 (3.3)	421 (4.6)	37 (3.8)	398 (4.0)	26 (3.5)	387 (7.0)
Qatar		76 (0.7)	444 (3.8)	14 (0.3)	402 (4.2)	10 (0.7)	440 (10.8)
Russian Federation		68 (3.7)	541 (5.5)	22 (3.4)	531 (6.3)	10 (2.3)	537 (14.7)
Saudi Arabia	r	38 (4.4)	380 (6.2)	46 (5.2)	355 (5.9)	16 (3.6)	349 (11.3)
Singapore		33 (0.0)	657 (4.6)	53 (0.0)	617 (4.7)	14 (0.0)	551 (8.7)
Slovenia		38 (3.9)	523 (2.7)	43 (4.2)	518 (3.9)	19 (3.2)	500 (3.7)
South Africa (9)	r	8 (2.1)	487 (13.1)	13 (3.0)	437 (20.5)	79 (3.3)	353 (4.6)
Sweden		64 (4.6)	512 (3.3)	27 (4.6)	492 (5.8)	9 (2.8)	449 (9.8)
Thailand		16 (2.9)	489 (16.7)	21 (3.2)	436 (11.6)	63 (3.8)	412 (5.6)
Turkey		23 (3.5)	501 (13.9)	24 (3.0)	477 (8.2)	53 (3.9)	433 (4.4)
United Arab Emirates	r	50 (2.0)	482 (4.3)	19 (1.7)	472 (6.6)	31 (1.5)	437 (4.0)
United States		20 (2.5)	561 (6.2)	24 (3.2)	534 (5.2)	56 (3.4)	497 (4.1)
International Avg.		31 (0.5)	513 (1.4)	34 (0.6)	486 (1.2)	36 (0.5)	457 (1.3)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.2: School Composition by Economic Background of the Student Body (Continued)

Country		More Affluent - Schools where more than 25% of the student body comes from economically affluent homes and not more than 25% from economically disadvantaged homes		Neither More Affluent Nor More Disadvantaged		More Disadvantaged - Schools where more than 25% of the student body comes from economically disadvantaged homes and not more than 25% from economically affluent homes	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Benchmarking Participants							
Buenos Aires, Argentina	s	47 (5.5)	427 (8.1)	14 (3.7)	391 (14.5)	39 (5.4)	358 (8.6)
Ontario, Canada	r	40 (5.0)	534 (3.7)	34 (5.0)	518 (5.3)	26 (4.0)	505 (5.6)
Quebec, Canada	r	48 (6.0)	559 (4.1)	26 (6.0)	554 (5.9)	26 (5.6)	526 (8.2)
Norway (8)		57 (4.5)	496 (2.8)	35 (4.2)	481 (3.2)	8 (2.2)	461 (9.1)
Abu Dhabi, UAE		53 (4.2)	450 (9.7)	16 (3.4)	448 (17.5)	32 (3.1)	424 (6.6)
Dubai, UAE	r	57 (0.4)	530 (3.6)	22 (0.3)	522 (3.5)	21 (0.2)	476 (4.8)
Florida, US	s	9 (5.3)	523 (44.8)	31 (9.0)	524 (9.7)	60 (8.4)	478 (13.8)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Approximately what percentage of students in your school have the following backgrounds?

	0 to 10%	11 to 25%	26 to 50%	More than 50%
1) Come from economically disadvantaged homes ----------	○	○	○	○
2) Come from economically affluent homes ----------	○	○	○	○

More Affluent - Schools where more than 25% of the student body comes from economically affluent homes and not more than 25% from economically disadvantaged homes

More Disadvantaged - Schools where more than 25% of the student body comes from economically disadvantaged homes and not more than 25% from economically affluent homes

Neither More Affluent nor More Disadvantaged - All other possible response combinations

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Exhibit 5.3: Schools with Students Having the Language of the Test as Their Native Language

Reported by Principals

Country	School has More than 90% of Students with Language of Test as Their Native Language		School has 51-90% of Students with Language of Test as Their Native Language		School has 50% or Less of Students with Language of Test as Their Native Language	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	62 (3.1)	517 (4.6)	22 (2.7)	530 (8.0)	16 (2.4)	502 (8.3)
Bahrain	67 (0.2)	446 (1.9)	8 (0.1)	468 (5.5)	25 (0.2)	454 (3.7)
Belgium (Flemish)	48 (3.6)	561 (3.0)	32 (4.0)	544 (3.6)	20 (2.8)	522 (5.6)
Bulgaria	49 (4.0)	544 (4.6)	23 (3.6)	515 (8.1)	28 (2.8)	497 (14.6)
Canada	47 (3.1)	513 (3.9)	34 (2.7)	508 (3.5)	19 (2.2)	509 (4.4)
Chile	100 (0.4)	460 (2.7)	0 (0.4)	~ ~	0 (0.0)	~ ~
Chinese Taipei	61 (4.1)	602 (2.5)	28 (3.5)	591 (3.8)	10 (2.7)	580 (7.1)
Croatia	95 (1.7)	503 (1.9)	4 (1.6)	489 (10.9)	1 (0.5)	~ ~
Cyprus	51 (4.0)	533 (3.7)	43 (4.2)	517 (3.4)	7 (2.2)	487 (10.1)
Czech Republic	94 (2.0)	528 (2.4)	6 (2.0)	535 (10.2)	0 (0.0)	~ ~
Denmark r	66 (4.1)	545 (3.3)	27 (3.9)	534 (5.6)	7 (2.2)	531 (11.7)
England	49 (4.5)	545 (4.2)	30 (4.3)	557 (7.8)	20 (3.6)	536 (8.3)
Finland	84 (3.0)	537 (1.9)	15 (2.9)	526 (7.1)	1 (0.9)	~ ~
France	71 (3.6)	498 (3.6)	20 (3.2)	468 (5.6)	9 (2.4)	453 (9.0)
Georgia	88 (3.0)	464 (3.8)	11 (2.9)	461 (17.6)	1 (0.7)	~ ~
Germany	30 (3.2)	533 (3.2)	43 (3.8)	526 (2.7)	28 (3.0)	500 (5.3)
Hong Kong SAR	85 (3.1)	610 (3.0)	8 (3.3)	622 (23.5)	7 (3.0)	660 (10.2)
Hungary	99 (0.6)	529 (3.2)	0 (0.0)	~ ~	1 (0.6)	~ ~
Indonesia	24 (2.4)	420 (7.9)	23 (3.0)	388 (7.6)	53 (3.2)	392 (6.1)
Iran, Islamic Rep. of	49 (3.0)	457 (5.7)	10 (1.9)	462 (5.2)	41 (3.1)	393 (6.0)
Ireland	67 (3.0)	554 (2.8)	29 (2.8)	535 (3.4)	4 (1.6)	530 (17.5)
Italy	59 (3.6)	506 (3.5)	39 (3.7)	510 (3.6)	2 (1.2)	~ ~
Japan	100 (0.0)	593 (2.0)	0 (0.0)	~ ~	0 (0.0)	~ ~
Jordan	98 (0.9)	388 (3.2)	1 (0.7)	~ ~	1 (0.6)	~ ~
Kazakhstan	57 (2.8)	536 (6.8)	23 (3.3)	562 (10.0)	20 (3.0)	549 (9.2)
Korea, Rep. of	98 (1.0)	608 (2.2)	1 (0.8)	~ ~	1 (0.5)	~ ~
Kuwait	59 (4.6)	345 (5.1)	12 (3.5)	354 (23.5)	29 (3.4)	362 (6.7)
Lithuania	89 (1.7)	536 (2.7)	9 (1.9)	527 (9.9)	2 (1.1)	~ ~
Morocco	63 (2.6)	380 (4.4)	13 (2.0)	372 (11.5)	24 (2.2)	375 (8.3)
Netherlands s	65 (5.3)	537 (2.4)	31 (5.4)	532 (3.1)	4 (2.2)	508 (8.0)
New Zealand	59 (3.3)	496 (3.7)	27 (3.1)	489 (5.7)	14 (2.8)	483 (10.7)
Northern Ireland r	74 (5.0)	578 (3.7)	18 (4.4)	552 (10.1)	8 (3.1)	538 (11.5)
Norway (5)	58 (4.7)	551 (3.4)	32 (4.7)	551 (3.9)	10 (3.1)	525 (10.9)
Oman	78 (2.2)	430 (3.1)	10 (1.9)	425 (9.0)	12 (1.5)	398 (7.4)
Poland	99 (0.8)	534 (2.2)	1 (0.8)	~ ~	0 (0.0)	~ ~
Portugal	82 (3.3)	543 (2.5)	11 (2.5)	534 (7.5)	7 (2.4)	540 (11.9)
Qatar	43 (2.6)	405 (4.8)	11 (2.4)	451 (17.9)	46 (2.1)	467 (5.4)
Russian Federation	73 (3.4)	564 (2.8)	16 (2.9)	571 (14.3)	11 (1.8)	556 (10.1)
Saudi Arabia	84 (2.7)	383 (4.7)	11 (2.6)	388 (11.2)	5 (1.6)	406 (20.5)
Serbia	84 (3.1)	523 (3.4)	11 (2.6)	507 (11.9)	5 (2.0)	472 (35.0)
Singapore	0 (0.0)	~ ~	0 (0.0)	~ ~	100 (0.0)	618 (3.8)
Slovak Republic	83 (2.4)	505 (2.7)	10 (2.2)	481 (10.3)	8 (1.8)	446 (12.8)
Slovenia	70 (3.7)	520 (2.3)	28 (3.7)	524 (3.1)	2 (1.4)	~ ~
South Africa (5)	18 (2.5)	428 (12.5)	13 (2.3)	425 (18.4)	69 (3.1)	359 (4.9)
Spain	54 (3.0)	507 (2.8)	29 (3.2)	511 (4.0)	17 (2.4)	489 (5.8)
Sweden	44 (4.6)	530 (2.9)	43 (4.3)	521 (4.0)	13 (2.7)	480 (10.8)
Turkey	80 (1.8)	499 (3.3)	7 (1.5)	466 (11.4)	14 (1.9)	397 (10.5)
United Arab Emirates	40 (1.3)	410 (3.9)	5 (0.7)	503 (11.6)	56 (1.5)	470 (4.3)
United States	50 (3.0)	553 (3.4)	31 (3.2)	535 (5.4)	19 (2.7)	510 (8.5)
International Avg.	66 (0.4)	506 (0.6)	17 (0.4)	502 (1.6)	16 (0.3)	486 (1.9)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report achievement.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.3: Schools with Students Having the Language of the Test as Their Native Language (Continued)

Country		School has More than 90% of Students with Language of Test as Their Native Language		School has 51-90% of Students with Language of Test as Their Native Language		School has 50% or Less of Students with Language of Test as Their Native Language	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Benchmarking Participants							
Buenos Aires, Argentina	s	93 (2.9)	437 (3.8)	7 (2.9)	398 (19.8)	0 (0.0)	~ ~
Ontario, Canada		39 (4.8)	513 (4.0)	38 (4.7)	511 (4.0)	24 (3.4)	512 (5.8)
Quebec, Canada		60 (6.2)	545 (4.2)	23 (5.2)	522 (7.1)	17 (4.3)	526 (8.4)
Norway (4)		56 (4.5)	493 (2.8)	33 (4.9)	501 (4.2)	11 (3.4)	473 (12.6)
Abu Dhabi, UAE		47 (3.4)	376 (6.8)	4 (1.7)	510 (22.8)	49 (3.7)	440 (9.6)
Dubai, UAE		23 (0.2)	461 (3.0)	7 (0.1)	565 (3.0)	69 (0.2)	518 (1.7)
Florida, US	r	43 (7.8)	559 (8.3)	26 (7.5)	537 (9.3)	31 (7.4)	537 (10.2)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.4: Schools with Students Having the Language of the Test as Their Native Language

Reported by Principals

Country	School has More than 90% of Students with Language of Test as Their Native Language		School has 51-90% of Students with Language of Test as Their Native Language		School has 50% or Less of Students with Language of Test as Their Native Language	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	62 (4.0)	506 (3.8)	27 (3.5)	513 (8.1)	11 (2.1)	497 (12.7)
Bahrain	74 (0.2)	442 (1.7)	8 (0.1)	484 (6.9)	18 (0.2)	491 (3.5)
Botswana (9)	6 (1.9)	379 (12.1)	2 (1.2)	~ ~	93 (2.3)	391 (2.3)
Canada	43 (2.9)	530 (3.2)	40 (3.1)	526 (3.6)	18 (2.6)	529 (6.5)
Chile	100 (0.3)	428 (3.7)	0 (0.3)	~ ~	0 (0.0)	~ ~
Chinese Taipei	66 (3.5)	610 (3.6)	28 (3.5)	583 (5.5)	5 (1.3)	546 (7.6)
Egypt	99 (0.7)	392 (4.2)	1 (0.7)	~ ~	0 (0.0)	~ ~
England r	66 (4.4)	523 (6.9)	24 (3.9)	544 (11.2)	10 (2.7)	515 (18.2)
Georgia	89 (2.7)	455 (3.7)	10 (2.8)	442 (12.4)	1 (0.7)	~ ~
Hong Kong SAR	48 (4.7)	579 (6.3)	6 (2.1)	573 (23.8)	46 (5.0)	607 (7.2)
Hungary	100 (0.0)	513 (3.9)	0 (0.0)	~ ~	0 (0.0)	~ ~
Iran, Islamic Rep. of	50 (2.9)	459 (6.9)	11 (2.3)	439 (11.3)	40 (3.1)	408 (5.4)
Ireland	70 (4.1)	528 (3.0)	26 (3.8)	509 (8.4)	4 (1.7)	525 (10.2)
Israel	66 (3.0)	514 (5.6)	28 (3.2)	506 (7.4)	7 (1.9)	509 (20.9)
Italy	63 (3.8)	489 (3.4)	36 (3.8)	502 (4.7)	1 (0.9)	~ ~
Japan	99 (0.9)	587 (2.3)	1 (0.6)	~ ~	1 (0.7)	~ ~
Jordan	99 (0.5)	385 (3.2)	0 (0.4)	~ ~	0 (0.3)	~ ~
Kazakhstan	55 (3.1)	521 (7.4)	26 (3.4)	539 (11.7)	20 (2.9)	534 (12.9)
Korea, Rep. of	100 (0.0)	606 (2.6)	0 (0.0)	~ ~	0 (0.0)	~ ~
Kuwait	84 (2.5)	384 (4.7)	4 (1.5)	345 (13.4)	11 (2.0)	461 (26.6)
Lebanon	4 (1.6)	423 (22.4)	9 (2.6)	465 (14.9)	87 (3.1)	442 (3.9)
Lithuania	88 (2.6)	510 (3.2)	10 (2.4)	519 (8.4)	2 (0.9)	~ ~
Malaysia	48 (3.9)	469 (5.5)	24 (3.8)	460 (6.8)	28 (4.1)	464 (8.6)
Malta	4 (0.0)	527 (6.2)	6 (0.1)	550 (3.2)	90 (0.1)	487 (1.1)
Morocco	74 (2.8)	385 (2.6)	10 (2.0)	387 (7.3)	16 (2.1)	383 (5.6)
New Zealand	68 (4.2)	496 (4.0)	29 (4.1)	485 (8.6)	3 (1.7)	449 (36.6)
Norway (9)	77 (3.4)	515 (2.7)	19 (2.8)	504 (3.7)	4 (1.8)	492 (4.5)
Oman	86 (1.9)	398 (2.6)	3 (1.3)	390 (11.7)	11 (1.2)	446 (9.5)
Qatar	51 (0.7)	393 (3.5)	9 (0.3)	478 (6.2)	40 (0.7)	485 (5.0)
Russian Federation	80 (2.6)	538 (4.6)	15 (2.4)	546 (7.5)	5 (1.7)	522 (34.5)
Saudi Arabia	93 (2.4)	369 (4.9)	3 (1.3)	359 (19.0)	4 (2.0)	353 (8.9)
Singapore	0 (0.0)	~ ~	0 (0.0)	~ ~	100 (0.0)	621 (3.2)
Slovenia	71 (3.6)	519 (2.8)	27 (3.6)	514 (4.5)	2 (1.0)	~ ~
South Africa (9)	12 (2.3)	421 (14.5)	8 (1.7)	448 (17.7)	80 (2.7)	361 (5.5)
Sweden	47 (4.4)	509 (4.3)	43 (4.5)	499 (3.9)	10 (2.4)	469 (11.7)
Thailand	86 (2.8)	436 (5.2)	7 (2.2)	391 (12.7)	7 (1.8)	411 (14.9)
Turkey	80 (2.5)	470 (5.1)	7 (1.6)	447 (17.0)	12 (2.1)	383 (11.1)
United Arab Emirates	48 (1.2)	426 (3.3)	5 (0.9)	522 (8.7)	47 (1.4)	495 (3.7)
United States	58 (2.8)	533 (3.8)	28 (2.8)	503 (5.8)	14 (2.5)	493 (8.9)
International Avg.	64 (0.4)	478 (1.0)	14 (0.4)	483 (1.9)	22 (0.3)	475 (2.6)
Benchmarking Participants						
Buenos Aires, Argentina s	95 (2.6)	400 (5.8)	4 (2.2)	364 (17.5)	1 (1.3)	~ ~
Ontario, Canada	37 (3.9)	520 (4.3)	45 (4.5)	519 (4.3)	18 (3.4)	526 (8.4)
Quebec, Canada	49 (5.5)	551 (3.4)	32 (4.9)	550 (8.7)	19 (5.3)	539 (9.6)
Norway (8)	75 (3.5)	491 (2.3)	21 (3.0)	484 (4.1)	4 (1.8)	459 (10.5)
Abu Dhabi, UAE	59 (2.8)	414 (6.0)	4 (1.6)	523 (27.7)	37 (3.2)	469 (8.3)
Dubai, UAE	24 (0.3)	465 (3.0)	7 (0.2)	551 (8.3)	69 (0.4)	526 (2.7)
Florida, US s	31 (8.2)	529 (7.3)	45 (8.4)	481 (12.9)	24 (7.9)	491 (21.7)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report achievement.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.5: Schools Where Students Enter the Primary Grades with Literacy and Numeracy Skills

Reported by Principals

Students were scored according to their principals' responses about the percentage of children in the school who begin first grade with the eleven key skills on the *Schools Where Students Enter the Primary Grades with Literacy and Numeracy Skills* scale. Students who attend **Schools Where More than 75% Enter with Skills** had a score on the scale of at least 11.7, which corresponds to their principals reporting that over 75% of the students have six of the skills and 51-75% of the students have five of the skills, on average. Students who attend **Schools Where Less than 25% Enter with Skills** had a score no higher than 8.6, which corresponds to their principals reporting that less than 25% of the students have six of the skills and 25-50% of the students have five of the skills, on average. All other students attended **Schools Where 25% to 75% Enter with Skills**.

Country		Schools Where More than 75% Enter with Skills		Schools Where 25-75% Enter with Skills		Schools Where Less than 25% Enter with Skills		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Ireland		82 (3.7)	552 (2.3)	18 (3.7)	537 (6.9)	0 (0.0)	~ ~	12.6 (0.08)
Singapore		78 (0.0)	625 (4.1)	21 (0.0)	595 (10.4)	1 (0.0)	~ ~	12.6 (0.00)
Hong Kong SAR		78 (4.2)	619 (3.7)	22 (4.2)	597 (9.2)	0 (0.0)	~ ~	12.5 (0.11)
Korea, Rep. of		69 (3.9)	614 (2.7)	29 (3.8)	597 (3.4)	2 (1.2)	~ ~	12.2 (0.12)
United States		57 (3.0)	551 (3.9)	33 (2.9)	526 (5.4)	10 (1.9)	519 (7.9)	11.5 (0.13)
Spain		56 (3.4)	515 (2.8)	41 (3.4)	495 (4.3)	3 (1.2)	453 (17.2)	11.7 (0.09)
Chinese Taipei		52 (4.5)	602 (2.4)	47 (4.4)	591 (3.0)	1 (0.7)	~ ~	11.8 (0.13)
England	r	47 (4.8)	563 (6.4)	48 (5.0)	534 (4.8)	4 (2.0)	523 (20.7)	11.4 (0.15)
Qatar		46 (3.4)	446 (6.4)	41 (3.1)	444 (5.8)	13 (2.5)	397 (12.6)	11.2 (0.16)
United Arab Emirates		40 (2.0)	473 (4.2)	44 (2.2)	435 (4.2)	16 (1.2)	422 (6.4)	10.9 (0.07)
Indonesia		34 (3.0)	426 (5.6)	58 (3.5)	385 (5.1)	8 (1.9)	375 (12.1)	10.9 (0.10)
Kazakhstan		33 (3.9)	553 (9.1)	64 (3.9)	542 (5.0)	3 (0.9)	530 (29.2)	11.1 (0.11)
Bahrain		32 (0.2)	454 (4.2)	52 (0.2)	450 (1.7)	15 (0.1)	444 (3.8)	10.7 (0.01)
Japan		31 (4.0)	600 (4.1)	67 (4.0)	590 (2.1)	2 (1.1)	~ ~	10.9 (0.10)
Canada		31 (3.3)	517 (4.8)	61 (3.8)	511 (2.5)	8 (1.6)	485 (11.2)	10.8 (0.09)
Kuwait		24 (3.7)	389 (9.1)	42 (4.6)	352 (8.2)	33 (3.9)	319 (5.2)	9.8 (0.16)
Jordan		21 (3.0)	420 (11.3)	52 (4.1)	389 (4.9)	27 (3.7)	371 (8.5)	9.9 (0.16)
Finland		18 (3.3)	540 (4.3)	80 (3.5)	536 (1.9)	2 (1.5)	~ ~	10.8 (0.10)
Oman		17 (1.9)	419 (7.2)	54 (3.2)	428 (4.3)	29 (2.8)	427 (5.2)	9.7 (0.10)
Sweden		16 (3.4)	534 (6.6)	76 (4.1)	517 (3.6)	8 (2.4)	508 (9.1)	10.5 (0.12)
Saudi Arabia		16 (2.2)	386 (11.3)	56 (3.7)	394 (5.3)	29 (3.2)	362 (8.3)	9.6 (0.10)
Russian Federation		15 (2.1)	577 (5.8)	73 (2.9)	563 (3.0)	12 (2.0)	534 (8.8)	10.2 (0.09)
Georgia		13 (3.2)	460 (15.9)	45 (4.8)	469 (5.9)	42 (4.5)	458 (5.4)	9.3 (0.17)
Chile		10 (2.4)	492 (12.0)	69 (4.3)	460 (3.8)	21 (3.6)	440 (5.8)	9.7 (0.13)
South Africa (5)		10 (2.3)	436 (20.7)	64 (3.6)	369 (4.8)	26 (3.1)	374 (6.5)	9.5 (0.12)
Australia		9 (1.9)	536 (9.8)	41 (3.8)	537 (4.9)	50 (3.9)	498 (5.0)	8.8 (0.14)
Netherlands	s	9 (3.3)	541 (6.3)	86 (4.1)	535 (2.1)	5 (2.5)	520 (1.9)	10.3 (0.11)
Bulgaria		8 (2.5)	545 (11.2)	68 (4.0)	532 (4.1)	24 (3.5)	496 (16.6)	9.7 (0.12)
Portugal		7 (2.3)	554 (10.0)	56 (4.1)	545 (3.6)	37 (4.2)	535 (4.3)	9.1 (0.13)
Lithuania		7 (1.9)	544 (9.4)	76 (3.7)	537 (3.2)	17 (3.3)	526 (7.9)	9.7 (0.11)
Poland		6 (2.4)	535 (7.5)	71 (4.0)	536 (2.6)	22 (3.6)	532 (4.7)	9.7 (0.14)
Croatia		6 (2.2)	513 (7.7)	84 (3.3)	503 (2.1)	9 (2.5)	488 (6.5)	9.9 (0.09)
Morocco		6 (1.7)	441 (14.5)	38 (2.7)	387 (5.2)	56 (2.5)	365 (5.6)	8.4 (0.11)
Serbia		6 (2.0)	541 (9.7)	79 (3.4)	520 (3.4)	15 (3.1)	499 (15.6)	9.8 (0.10)
New Zealand		6 (1.5)	539 (8.3)	42 (4.0)	507 (4.8)	53 (3.8)	475 (4.4)	8.6 (0.12)
Norway (5)		5 (2.4)	566 (16.3)	65 (4.4)	550 (3.3)	30 (4.6)	542 (5.3)	9.2 (0.15)
France		5 (2.0)	503 (14.7)	92 (2.1)	487 (3.4)	3 (0.5)	470 (12.0)	10.1 (0.08)
Iran, Islamic Rep. of		5 (1.7)	456 (12.6)	25 (3.0)	437 (9.9)	70 (3.4)	428 (3.9)	8.1 (0.14)
Denmark	r	5 (1.8)	553 (9.5)	79 (3.1)	544 (3.2)	16 (2.9)	529 (6.5)	9.6 (0.11)
Italy		4 (1.8)	519 (8.0)	57 (4.1)	507 (3.7)	38 (4.0)	507 (4.0)	9.0 (0.13)
Cyprus		2 (1.5)	~ ~	53 (4.8)	527 (3.9)	45 (4.9)	518 (4.9)	8.6 (0.13)
Belgium (Flemish)		2 (1.1)	~ ~	69 (3.7)	547 (2.4)	30 (3.5)	548 (5.2)	9.1 (0.11)
Turkey		1 (0.9)	~ ~	35 (3.1)	493 (7.5)	63 (3.0)	475 (3.8)	8.2 (0.10)
Germany		1 (0.9)	~ ~	43 (3.5)	527 (2.7)	55 (3.5)	517 (3.6)	8.5 (0.09)
Slovak Republic		1 (0.6)	~ ~	50 (3.4)	511 (3.4)	49 (3.5)	484 (4.3)	8.6 (0.09)
Czech Republic		0 (0.0)	~ ~	51 (4.3)	533 (2.9)	49 (4.3)	523 (3.5)	8.5 (0.09)
Hungary		0 (0.0)	~ ~	34 (4.2)	551 (5.5)	66 (4.2)	518 (4.9)	7.8 (0.11)
Slovenia		0 (0.0)	~ ~	44 (4.6)	523 (2.9)	56 (4.6)	519 (2.7)	8.3 (0.11)
Northern Ireland		- -	- -	- -	- -	- -	- -	- -
International Avg.		21 (0.4)	516 (1.5)	54 (0.5)	504 (0.7)	24 (0.4)	474 (1.5)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data are not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.5: Schools Where Students Enter the Primary Grades with Literacy and Numeracy Skills (Continued)

Country	Schools Where More than 75% Enter with Skills		Schools Where 25-75% Enter with Skills		Schools Where Less than 25% Enter with Skills		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	58 (0.3)	515 (1.8)	28 (0.3)	501 (2.5)	14 (0.1)	498 (3.3)	11.4 (0.01)
Florida, US r	42 (9.1)	548 (7.4)	46 (9.7)	553 (9.6)	12 (4.6)	515 (12.9)	10.9 (0.32)
Ontario, Canada	41 (5.2)	524 (4.3)	54 (5.8)	505 (2.9)	5 (2.0)	484 (10.5)	11.2 (0.14)
Abu Dhabi, UAE	27 (3.8)	444 (13.9)	54 (4.4)	407 (8.3)	18 (3.2)	380 (15.4)	10.4 (0.17)
Quebec, Canada	15 (4.1)	538 (11.8)	76 (5.5)	539 (4.2)	9 (3.6)	524 (10.9)	10.3 (0.15)
Buenos Aires, Argentina s	15 (4.3)	453 (8.5)	61 (5.2)	448 (4.6)	24 (4.1)	395 (7.0)	9.9 (0.19)
Norway (4)	4 (1.9)	499 (7.9)	67 (4.0)	493 (3.0)	29 (4.5)	494 (6.3)	9.2 (0.14)

About how many of the students in your school can do the following when they begin the first grade of primary/elementary school?

	More than 75%	51–75%	25–50%	Less than 25%
1) Recognize most of the letters of the alphabet	○	○	○	○
2) Read some words	○	○	○	○
3) Read sentences	○	○	○	○
4) Write letters of the alphabet	○	○	○	○
5) Write some words	○	○	○	○
6) Count up to 100 or higher	○	○	○	○
7) Recognize written numbers from 1-10	○	○	○	○
8) Recognize written numbers higher than 10	○	○	○	○
9) Write numbers from 1-10	○	○	○	○
10) Do simple addition	○	○	○	○
11) Do simple subtraction	○	○	○	○

More than 75% Enter with Skills — 11.7

25-75% Enter with Skills

Less than 25% Enter with Skills — 8.6

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.6: Instruction Affected by Mathematics Resource Shortages – Principals' Reports

Reported by Principals

Students were scored according to their principals' responses concerning thirteen school and classroom resources on the *Mathematics Resource Shortages* scale. Students in schools where instruction was **Not Affected** by resource shortages had a score on the scale of at least 11.1, which corresponds to their principals reporting that shortages affected instruction "not at all" for seven of the thirteen resources and "a little" for the other six, on average. Students in schools where instruction was **Affected A Lot** had a score no higher than 6.9, which corresponds to their principals reporting that shortages affected instruction "a lot" for seven of the thirteen resources and "some" for the other six, on average. All other students attended schools where instruction was **Affected** by resource shortages.

Country	Not Affected		Affected		Affected A Lot		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Korea, Rep. of	73 (3.9)	607 (2.8)	27 (3.9)	610 (4.5)	0 (0.0)	~ ~	12.5 (0.18)	0.7 (0.24) ▲
Slovenia	59 (4.4)	518 (2.5)	41 (4.4)	525 (2.8)	0 (0.0)	~ ~	11.6 (0.15)	-0.2 (0.19)
Singapore	49 (0.0)	614 (5.6)	43 (0.0)	617 (5.5)	8 (0.0)	650 (13.5)	10.9 (0.00)	0.4 (0.00) ▲
England	49 (4.6)	557 (5.4)	51 (4.6)	537 (5.2)	0 (0.0)	~ ~	11.2 (0.15)	0.1 (0.23)
Poland	48 (3.9)	540 (2.9)	50 (3.8)	532 (3.4)	2 (1.4)	~ ~	11.1 (0.16)	◊ ◊
Qatar	47 (3.1)	458 (5.9)	33 (3.2)	428 (6.5)	20 (2.2)	412 (6.8)	10.3 (0.20)	1.1 (0.31) ▲
Australia	44 (3.8)	526 (4.7)	55 (3.7)	512 (5.3)	1 (0.5)	~ ~	11.1 (0.15)	0.0 (0.21)
United States	39 (3.1)	547 (5.4)	59 (3.2)	534 (3.3)	2 (0.9)	~ ~	10.8 (0.13)	-0.2 (0.18)
Czech Republic	39 (3.6)	532 (4.0)	61 (3.6)	526 (2.5)	0 (0.0)	~ ~	11.1 (0.10)	0.3 (0.16)
New Zealand	37 (3.8)	501 (4.1)	62 (3.8)	487 (3.9)	1 (0.6)	~ ~	10.8 (0.12)	-0.1 (0.17)
Cyprus	37 (4.6)	532 (4.0)	60 (4.6)	519 (3.7)	3 (1.5)	502 (11.3)	10.6 (0.21)	◊ ◊
Canada	37 (3.2)	520 (3.4)	63 (3.1)	505 (3.7)	0 (0.2)	~ ~	10.9 (0.12)	◊ ◊
Bulgaria	37 (5.0)	532 (10.4)	62 (5.2)	521 (5.2)	1 (1.2)	~ ~	10.8 (0.16)	◊ ◊
Georgia	36 (3.9)	471 (7.8)	64 (4.0)	458 (4.6)	0 (0.3)	~ ~	10.9 (0.13)	0.4 (0.19)
Kazakhstan	34 (3.9)	546 (8.0)	63 (4.0)	543 (5.3)	3 (1.1)	551 (22.3)	10.3 (0.19)	0.2 (0.29)
Norway (5)	34 (4.3)	556 (3.6)	66 (4.3)	545 (3.8)	0 (0.0)	~ ~	10.7 (0.11)	◊ ◊
Northern Ireland r	33 (4.8)	571 (7.3)	67 (4.8)	570 (4.4)	0 (0.0)	~ ~	10.7 (0.16)	r 0.1 (0.24)
Netherlands s	32 (5.4)	535 (3.4)	68 (5.4)	534 (2.3)	0 (0.0)	~ ~	10.6 (0.15)	s -0.5 (0.21)
Sweden	30 (4.3)	518 (5.4)	70 (4.3)	519 (3.2)	0 (0.0)	~ ~	10.7 (0.13)	0.2 (0.19)
Chinese Taipei	30 (3.4)	605 (3.1)	69 (3.5)	594 (2.3)	1 (1.0)	~ ~	10.5 (0.13)	1.7 (0.19) ▲
Denmark r	30 (3.5)	535 (5.1)	70 (3.6)	544 (3.4)	1 (0.8)	~ ~	10.6 (0.11)	r 0.7 (0.14) ▲
Spain	29 (3.1)	513 (3.1)	71 (3.1)	502 (3.3)	0 (0.0)	~ ~	10.6 (0.09)	-0.3 (0.19)
United Arab Emirates	28 (1.7)	494 (5.2)	58 (1.9)	426 (3.4)	14 (1.2)	444 (5.3)	9.8 (0.11)	0.0 (0.15)
Finland	27 (3.7)	538 (3.1)	73 (3.7)	535 (2.8)	0 (0.0)	~ ~	10.5 (0.11)	0.3 (0.17)
Chile	25 (3.5)	476 (5.9)	72 (3.7)	455 (3.4)	3 (1.7)	426 (11.0)	10.1 (0.18)	0.5 (0.24)
Russian Federation	25 (3.7)	572 (6.4)	72 (4.0)	561 (4.3)	3 (1.4)	550 (11.6)	10.1 (0.14)	0.1 (0.21)
Belgium (Flemish)	25 (3.6)	550 (4.5)	75 (3.6)	546 (2.6)	0 (0.0)	~ ~	10.3 (0.11)	-0.4 (0.17)
Japan	24 (3.6)	595 (4.3)	75 (3.7)	592 (2.1)	1 (0.8)	~ ~	10.2 (0.15)	-0.2 (0.20)
Ireland	23 (3.2)	552 (5.9)	76 (3.2)	546 (2.2)	1 (0.7)	~ ~	10.1 (0.11)	-0.3 (0.19)
Hong Kong SAR	22 (3.5)	638 (7.9)	76 (3.6)	608 (3.8)	2 (1.2)	~ ~	9.9 (0.13)	1.7 (0.15) ▲
Croatia	22 (3.6)	505 (4.3)	78 (3.6)	502 (2.3)	0 (0.0)	~ ~	10.2 (0.12)	-0.3 (0.20)
Lithuania	22 (3.1)	532 (8.2)	76 (3.6)	536 (2.8)	3 (1.5)	540 (9.5)	10.2 (0.13)	0.0 (0.18)
Germany	20 (3.4)	524 (4.6)	79 (3.4)	520 (2.7)	0 (0.5)	~ ~	10.2 (0.10)	-0.3 (0.14)
Bahrain	20 (0.2)	465 (3.8)	62 (0.2)	446 (1.7)	19 (0.2)	447 (5.6)	9.0 (0.01)	-0.2 (0.36)
Portugal	19 (2.9)	542 (6.0)	81 (2.9)	541 (2.4)	0 (0.0)	~ ~	9.9 (0.10)	0.4 (0.17)
Hungary	16 (3.0)	524 (11.3)	79 (3.5)	530 (3.9)	4 (1.9)	540 (15.4)	9.5 (0.14)	-1.0 (0.22) ▼
France	16 (3.5)	492 (8.6)	83 (3.5)	487 (3.2)	0 (0.4)	~ ~	9.7 (0.14)	◊ ◊
Serbia	15 (2.7)	526 (7.9)	82 (3.1)	518 (3.9)	3 (1.5)	515 (21.0)	9.6 (0.12)	0.1 (0.19)
Slovak Republic	13 (2.4)	503 (7.5)	84 (2.6)	498 (3.2)	3 (1.1)	472 (19.3)	9.3 (0.12)	-0.7 (0.15) ▼
Oman	13 (2.4)	412 (8.4)	77 (2.9)	429 (3.2)	10 (1.9)	417 (8.4)	8.9 (0.13)	r 0.4 (0.16) ▲
Kuwait	12 (3.0)	387 (16.0)	71 (4.4)	343 (4.8)	17 (4.2)	361 (16.0)	8.6 (0.23)	◊ ◊
Saudi Arabia	9 (2.2)	418 (11.0)	81 (2.5)	378 (4.9)	10 (2.1)	398 (11.2)	8.9 (0.15)	-0.2 (0.21)
Morocco	8 (1.9)	373 (13.9)	88 (2.0)	377 (3.9)	4 (1.3)	394 (27.2)	9.7 (0.09)	-0.2 (0.13)
Jordan	7 (2.4)	437 (16.4)	78 (3.7)	376 (3.5)	15 (3.1)	431 (11.4)	8.5 (0.15)	◊ ◊
South Africa (5)	5 (1.4)	498 (30.3)	88 (2.6)	371 (3.6)	7 (2.2)	341 (13.6)	9.0 (0.11)	◊ ◊
Iran, Islamic Rep. of	4 (1.4)	469 (43.7)	88 (2.1)	429 (4.1)	8 (1.8)	436 (12.1)	8.5 (0.10)	0.1 (0.16)
Italy	2 (1.3)	~ ~	98 (1.3)	506 (2.7)	0 (0.0)	~ ~	9.3 (0.07)	-0.4 (0.11) ▼
Turkey	1 (1.1)	~ ~	79 (3.0)	483 (4.1)	20 (2.8)	486 (7.5)	7.9 (0.12)	-0.1 (0.14)
Indonesia	0 (0.3)	~ ~	97 (1.1)	395 (3.9)	3 (1.0)	476 (14.0)	9.1 (0.05)	◊ ◊
International Avg.	27 (0.5)	519 (1.5)	69 (0.5)	502 (0.5)	4 (0.2)	466 (3.1)		

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.6: Instruction Affected by Mathematics Resource Shortages – Principals' Reports (Continued)

Country	Not Affected		Affected		Affected A Lot		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Dubai, UAE	45 (0.2)	530 (2.1)	36 (0.2)	489 (2.2)	19 (0.2)	497 (3.1)	10.6 (0.01)	-0.1 (0.02) ▼
Quebec, Canada	43 (6.5)	545 (4.4)	57 (6.5)	531 (5.2)	0 (0.2)	~ ~	11.2 (0.27)	0.4 (0.31)
Florida, US r	42 (7.5)	534 (7.9)	56 (7.8)	556 (7.5)	2 (2.3)	~ ~	10.7 (0.32)	r -0.3 (0.40)
Buenos Aires, Argentina s	39 (5.2)	440 (7.8)	56 (5.3)	427 (5.2)	5 (1.7)	432 (11.7)	10.9 (0.23)	◊ ◊
Norway (4)	34 (4.6)	500 (3.7)	66 (4.6)	490 (3.2)	0 (0.0)	~ ~	10.7 (0.11)	0.3 (0.16)
Ontario, Canada	32 (5.3)	518 (4.3)	68 (5.3)	509 (3.0)	0 (0.0)	~ ~	10.6 (0.17)	0.2 (0.22)
Abu Dhabi, UAE	25 (4.2)	468 (15.2)	66 (4.4)	389 (7.1)	9 (2.4)	429 (17.2)	9.7 (0.27)	0.4 (0.34)

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How much is your school's capacity to provide instruction affected by a shortage or inadequacy of the following?

	Not at all	A little	Some	A lot
A. General School Resources				
1) Instructional materials (e.g., textbooks)	○	○	○	○
2) Supplies (e.g., papers, pencils, materials)	○	○	○	○
3) School buildings and grounds	○	○	○	○
4) Heating/cooling and lighting systems	○	○	○	○
5) Instructional space (e.g., classrooms)	○	○	○	○
6) Technologically competent staff	○	○	○	○
7) Audio-visual resources for delivery of instruction (e.g., interactive white boards, digital projectors)	○	○	○	○
8) Computer technology for teaching and learning (e.g., computers or tablets for student use)	○	○	○	○
B. Resources for Mathematics Instruction				
1) Teachers with a specialization in mathematics	○	○	○	○
2) Computer software/applications for mathematics instruction	○	○	○	○
3) Library resources relevant to mathematics instruction	○	○	○	○
4) Calculators for mathematics instruction	○	○	○	○
5) Concrete objects or materials to help students understand quantities or procedures	○	○	○	○

Not Affected (11.1) ← Affected → Affected A Lot (6.9)

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Exhibit 5.7: Instruction Affected by Mathematics Resource Shortages – Principals' Reports

Reported by Principals

Students were scored according to their principals' responses concerning thirteen school and classroom resources on the *Mathematics Resource Shortages* scale. Students in schools where instruction was **Not Affected** by resource shortages had a score on the scale of at least 11.1, which corresponds to their principals reporting that shortages affected instruction "not at all" for seven of the thirteen resources and "a little" for the other six, on average. Students in schools where instruction was **Affected A Lot** had a score no higher than 7.5, which corresponds to their principals reporting that shortages affected instruction "a lot" for seven of the thirteen resources and "some" for the other six, on average. All other students attended schools where instruction was **Affected** by resource shortages.

Country	Not Affected		Affected		Affected A Lot		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Singapore	74 (0.0)	623 (3.9)	20 (0.0)	613 (8.2)	6 (0.0)	622 (12.6)	12.0 (0.00)	0.2 (0.00) ▲
Korea, Rep. of	62 (3.8)	605 (3.3)	37 (3.9)	607 (4.0)	1 (0.7)	~ ~	11.6 (0.15)	0.1 (0.23)
Slovenia	56 (4.6)	517 (2.9)	44 (4.6)	516 (3.9)	0 (0.0)	~ ~	11.5 (0.12)	-0.4 (0.18)
Malta	55 (0.2)	501 (1.3)	45 (0.2)	482 (1.5)	0 (0.0)	~ ~	11.4 (0.00)	◊ ◊
Australia	51 (3.5)	520 (3.3)	48 (3.4)	493 (5.2)	1 (0.7)	~ ~	11.3 (0.11)	0.1 (0.19)
England r	48 (4.6)	539 (6.2)	52 (4.6)	515 (6.9)	0 (0.0)	~ ~	11.3 (0.14)	r 0.0 (0.21)
Norway (9)	47 (4.1)	516 (3.8)	53 (4.1)	508 (2.5)	0 (0.0)	~ ~	11.1 (0.11)	◊ ◊
Japan	46 (3.3)	593 (4.2)	53 (3.4)	580 (3.1)	1 (0.6)	~ ~	10.9 (0.10)	0.0 (0.17)
Hong Kong SAR	46 (4.2)	600 (7.3)	51 (4.3)	586 (6.8)	3 (1.6)	582 (14.1)	10.9 (0.16)	0.0 (0.25)
Qatar	45 (0.4)	455 (3.1)	34 (0.4)	421 (4.0)	20 (0.4)	424 (8.5)	10.3 (0.03)	1.2 (0.06) ▲
Canada	45 (3.4)	538 (3.0)	54 (3.4)	519 (3.1)	0 (0.3)	~ ~	11.2 (0.11)	◊ ◊
Sweden	41 (4.1)	501 (4.3)	58 (4.0)	500 (4.0)	1 (0.9)	~ ~	10.9 (0.10)	r 0.0 (0.16)
New Zealand	39 (5.0)	500 (6.0)	61 (5.0)	486 (4.1)	0 (0.0)	~ ~	10.9 (0.15)	-0.4 (0.22)
United States	37 (3.1)	532 (5.9)	61 (3.1)	512 (3.7)	3 (0.9)	494 (9.0)	10.8 (0.12)	-0.2 (0.16)
Kazakhstan	32 (4.0)	524 (9.7)	63 (3.8)	533 (6.8)	5 (1.7)	498 (28.3)	10.2 (0.18)	0.1 (0.27)
United Arab Emirates	31 (2.2)	508 (4.8)	53 (2.3)	441 (3.9)	16 (1.7)	456 (7.2)	9.9 (0.12)	0.2 (0.15)
Georgia	29 (3.3)	449 (5.9)	70 (3.3)	454 (4.5)	1 (0.8)	~ ~	10.5 (0.10)	0.3 (0.15)
Chinese Taipei	29 (3.5)	613 (6.6)	71 (3.5)	594 (3.3)	1 (0.5)	~ ~	10.6 (0.11)	0.1 (0.20)
Chile	27 (3.5)	453 (6.7)	70 (3.8)	419 (4.9)	3 (1.6)	413 (19.4)	10.2 (0.13)	0.4 (0.18)
Ireland	27 (3.5)	526 (7.3)	71 (3.8)	522 (3.3)	2 (1.5)	~ ~	10.4 (0.12)	◊ ◊
Lithuania	23 (3.9)	519 (8.0)	74 (3.8)	509 (3.0)	2 (1.5)	~ ~	10.2 (0.13)	0.0 (0.17)
Russian Federation	19 (2.8)	550 (8.9)	80 (2.9)	536 (5.1)	1 (0.5)	~ ~	10.2 (0.09)	0.0 (0.16)
Hungary	17 (3.5)	526 (13.9)	80 (3.7)	510 (4.0)	2 (1.3)	~ ~	9.8 (0.11)	-0.7 (0.18) ▼
Kuwait	16 (3.4)	443 (22.9)	63 (3.2)	380 (4.4)	21 (3.6)	388 (9.4)	9.1 (0.20)	◊ ◊
Israel	16 (2.7)	559 (8.9)	76 (3.2)	508 (4.8)	8 (1.9)	431 (18.4)	9.6 (0.11)	-0.3 (0.21)
Bahrain	16 (0.2)	497 (3.8)	63 (0.3)	444 (1.8)	21 (0.2)	456 (3.3)	9.2 (0.01)	-0.3 (0.01) ▼
Oman	15 (2.1)	426 (7.3)	77 (2.6)	395 (2.8)	8 (1.5)	422 (10.2)	9.4 (0.10)	0.4 (0.13) ▲
Lebanon	14 (2.8)	479 (9.2)	78 (3.0)	436 (4.4)	8 (1.5)	443 (9.3)	9.6 (0.14)	-0.1 (0.22)
Saudi Arabia	13 (3.6)	365 (17.2)	74 (4.2)	363 (4.7)	13 (2.9)	396 (14.4)	9.1 (0.17)	-0.2 (0.21)
Jordan	7 (1.5)	431 (10.9)	80 (2.9)	376 (3.4)	13 (2.8)	418 (10.9)	9.0 (0.11)	-0.1 (0.16)
South Africa (9)	6 (1.4)	463 (19.1)	87 (2.3)	368 (4.8)	7 (2.1)	346 (8.7)	9.3 (0.09)	0.0 (0.13)
Italy	6 (1.9)	516 (11.2)	93 (2.0)	493 (2.8)	1 (0.8)	~ ~	9.7 (0.07)	-0.3 (0.10) ▼
Iran, Islamic Rep. of	6 (1.6)	511 (25.7)	82 (2.7)	432 (4.3)	12 (2.3)	428 (11.9)	9.1 (0.10)	0.2 (0.13)
Malaysia	6 (2.4)	431 (9.2)	70 (4.2)	465 (4.6)	24 (3.8)	474 (8.5)	8.4 (0.13)	-0.9 (0.20) ▼
Thailand	5 (1.7)	461 (21.2)	81 (2.8)	430 (5.0)	14 (2.7)	429 (15.7)	8.9 (0.12)	0.4 (0.18)
Morocco	3 (0.9)	413 (16.6)	95 (1.2)	383 (2.3)	1 (0.7)	~ ~	9.6 (0.05)	0.0 (0.08)
Turkey	2 (1.0)	~ ~	81 (3.0)	457 (4.7)	17 (3.1)	453 (9.9)	8.4 (0.11)	0.0 (0.14)
Egypt	1 (0.6)	~ ~	91 (2.0)	389 (4.4)	8 (2.0)	431 (14.5)	8.8 (0.07)	◊ ◊
Botswana (9)	1 (0.0)	~ ~	92 (2.4)	390 (2.4)	7 (2.4)	402 (14.8)	8.7 (0.07)	-0.2 (0.10)
International Avg.	27 (0.5)	506 (1.8)	66 (0.5)	476 (0.7)	6 (0.3)	448 (2.9)		

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

▲ Significantly higher than 2011

▼ Significantly lower than 2011

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.7: Instruction Affected by Mathematics Resource Shortages – Principals' Reports (Continued)

Country	Not Affected		Affected		Affected A Lot		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Quebec, Canada	78 (4.8)	550 (3.4)	22 (4.8)	544 (8.3)	0 (0.0)	~ ~	12.3 (0.17)	0.4 (0.22)
Dubai, UAE	56 (0.3)	537 (3.1)	30 (0.3)	478 (2.8)	13 (0.2)	497 (7.9)	11.1 (0.02)	0.7 (0.03) ▲
Norway (8)	46 (4.0)	490 (3.3)	54 (4.0)	487 (2.9)	0 (0.0)	~ ~	11.1 (0.12)	0.0 (0.16)
Buenos Aires, Argentina r	45 (4.7)	433 (5.7)	50 (4.7)	363 (8.4)	5 (2.7)	403 (14.9)	10.7 (0.19)	◊ ◊
Florida, US s	31 (8.4)	510 (13.5)	69 (8.4)	492 (12.0)	0 (0.0)	~ ~	10.4 (0.27)	s -1.0 (0.44)
Ontario, Canada	27 (4.7)	531 (5.8)	72 (4.6)	517 (3.5)	1 (0.6)	~ ~	10.6 (0.16)	-0.2 (0.22)
Abu Dhabi, UAE	21 (3.8)	476 (14.0)	66 (4.3)	423 (7.1)	13 (2.9)	457 (13.1)	9.4 (0.22)	0.2 (0.28)

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How much is your school's capacity to provide instruction affected by a shortage or inadequacy of the following?

	Not at all	A little	Some	A lot
A. General School Resources				
1) Instructional materials (e.g., textbooks)	○	○	○	○
2) Supplies (e.g., papers, pencils, materials)	○	○	○	○
3) School buildings and grounds	○	○	○	○
4) Heating/cooling and lighting systems	○	○	○	○
5) Instructional space (e.g., classrooms)	○	○	○	○
6) Technologically competent staff	○	○	○	○
7) Audio-visual resources for delivery of instruction (e.g., interactive white boards, digital projectors)	○	○	○	○
8) Computer technology for teaching and learning (e.g., computers or tablets for student use)	○	○	○	○
B. Resources for Mathematics Instruction				
1) Teachers with a specialization in mathematics	○	○	○	○
2) Computer software/applications for mathematics instruction	○	○	○	○
3) Library resources relevant to mathematics instruction	○	○	○	○
4) Calculators for mathematics instruction	○	○	○	○
5) Concrete objects or materials to help students understand quantities or procedures	○	○	○	○

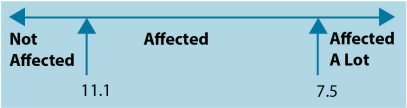

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Exhibit 5.8: Problems with School Conditions and Resources – Teachers' Reports

Reported by Teachers

Students were scored according to their teachers' responses concerning seven conditions and resources on the *Problems with School Conditions and Resources* scale. Students whose teachers reported **Hardly Any Problems** with their school conditions and resources had a score on the scale of at least 10.6, which corresponds to their teachers reporting "not a problem" for four of seven conditions and resources and "minor problem" for the other three, on average. Students whose teachers reported **Moderate to Severe Problems** had a score no higher than 8.2, which corresponds to their teachers reporting "moderate problem" for four of seven conditions and resources and "minor problem" for the other three, on average. All other students had teachers that reported **Minor Problems** with their school conditions and resources.

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Czech Republic	63 (3.5)	529 (2.9)	34 (3.5)	528 (4.1)	3 (1.3)	513 (11.7)	11.1 (0.13)
Northern Ireland r	60 (4.2)	572 (3.5)	30 (3.3)	570 (7.5)	10 (3.2)	579 (9.1)	10.8 (0.19)
Qatar	58 (3.5)	432 (5.8)	31 (3.2)	451 (6.6)	11 (1.9)	444 (10.3)	11.1 (0.14)
United Arab Emirates	57 (2.4)	463 (3.9)	32 (1.9)	446 (4.6)	10 (1.7)	411 (11.3)	10.9 (0.09)
Korea, Rep. of	57 (3.8)	612 (3.0)	36 (3.9)	606 (3.8)	8 (2.3)	592 (8.1)	10.8 (0.15)
England	55 (4.1)	544 (5.0)	37 (3.7)	553 (5.1)	9 (2.4)	538 (10.1)	10.8 (0.16)
Bulgaria	54 (4.8)	524 (7.8)	36 (4.4)	524 (7.3)	10 (2.4)	528 (7.3)	10.6 (0.18)
Australia	53 (3.8)	518 (5.5)	38 (3.4)	518 (4.6)	8 (1.9)	519 (6.5)	10.6 (0.12)
Singapore	53 (2.6)	615 (5.7)	42 (2.5)	620 (5.5)	5 (1.2)	640 (13.0)	10.8 (0.09)
Chile	52 (4.4)	474 (4.5)	37 (4.3)	448 (4.8)	12 (2.7)	443 (8.0)	10.5 (0.17)
Kazakhstan	51 (4.1)	546 (6.6)	39 (4.0)	545 (7.6)	10 (2.2)	532 (12.9)	10.5 (0.16)
Ireland	51 (4.3)	548 (3.7)	34 (4.1)	547 (3.5)	15 (3.3)	548 (6.8)	10.4 (0.17)
Slovak Republic	50 (3.6)	492 (3.8)	39 (3.2)	506 (4.0)	11 (2.1)	498 (9.6)	10.7 (0.13)
Slovenia	50 (3.6)	519 (3.0)	33 (3.3)	518 (2.9)	17 (3.0)	529 (3.5)	10.4 (0.14)
New Zealand	48 (3.2)	494 (4.1)	44 (3.2)	490 (3.8)	8 (1.7)	484 (11.2)	10.5 (0.11)
Bahrain	47 (2.3)	454 (2.3)	40 (1.8)	453 (2.6)	12 (1.3)	452 (5.9)	10.6 (0.11)
Hong Kong SAR	45 (4.4)	622 (4.4)	46 (4.4)	611 (4.7)	9 (2.3)	597 (6.5)	10.4 (0.13)
Russian Federation	43 (3.5)	567 (4.0)	45 (3.9)	560 (4.5)	13 (3.5)	567 (18.4)	10.2 (0.11)
Oman	41 (2.8)	423 (4.7)	48 (2.9)	431 (3.9)	11 (1.9)	410 (7.9)	10.3 (0.11)
United States	41 (2.6)	544 (3.6)	48 (2.7)	538 (4.1)	11 (1.7)	522 (7.8)	10.3 (0.10)
Canada	40 (2.9)	508 (4.1)	49 (3.0)	512 (2.6)	11 (1.7)	515 (6.7)	10.2 (0.09)
Kuwait	40 (3.8)	358 (7.8)	42 (3.0)	351 (6.4)	18 (2.6)	339 (10.8)	10.0 (0.16)
Netherlands r	39 (4.2)	525 (2.4)	49 (4.0)	532 (2.6)	12 (2.2)	539 (3.4)	10.1 (0.14)
Spain	39 (3.1)	507 (3.3)	46 (3.6)	506 (3.4)	15 (3.0)	498 (6.7)	10.3 (0.14)
Cyprus	37 (3.5)	528 (3.2)	45 (3.4)	523 (4.7)	18 (2.5)	513 (5.6)	10.1 (0.16)
Belgium (Flemish)	35 (3.6)	546 (3.2)	49 (3.5)	545 (3.7)	16 (2.8)	548 (6.7)	10.0 (0.14)
Lithuania	35 (3.9)	535 (5.2)	48 (3.6)	536 (3.6)	16 (2.8)	537 (7.0)	10.0 (0.16)
Portugal	34 (3.4)	545 (3.9)	45 (3.5)	545 (2.8)	21 (2.8)	531 (6.2)	9.9 (0.14)
Poland	33 (3.9)	537 (3.6)	57 (4.3)	535 (2.9)	10 (2.4)	524 (7.3)	10.0 (0.14)
Chinese Taipei	32 (3.6)	602 (3.2)	58 (3.6)	593 (2.6)	11 (1.8)	597 (6.5)	10.1 (0.13)
Norway (5)	31 (3.8)	554 (4.4)	52 (4.2)	555 (3.1)	17 (3.4)	528 (5.0)	9.8 (0.13)
Saudi Arabia	30 (3.2)	399 (7.0)	42 (3.4)	386 (6.7)	28 (3.1)	363 (8.4)	9.3 (0.14)
Jordan	27 (3.6)	419 (8.8)	34 (3.9)	379 (6.5)	39 (3.3)	376 (5.2)	9.2 (0.12)
Georgia	27 (3.7)	477 (8.8)	48 (4.5)	460 (5.3)	25 (3.8)	457 (8.8)	9.6 (0.17)
Turkey	27 (2.9)	511 (8.6)	37 (2.9)	486 (5.9)	36 (2.6)	459 (5.5)	9.0 (0.12)
Germany	26 (2.9)	531 (3.6)	38 (3.6)	515 (3.5)	35 (3.4)	519 (4.2)	9.2 (0.13)
Croatia	26 (3.3)	496 (3.1)	51 (3.2)	503 (2.7)	23 (2.8)	508 (5.0)	9.5 (0.17)
Serbia	25 (3.5)	521 (10.4)	40 (3.6)	512 (5.3)	35 (3.6)	523 (4.1)	9.3 (0.15)
Finland	23 (2.8)	533 (3.2)	55 (3.4)	537 (2.8)	22 (2.9)	532 (4.1)	9.5 (0.11)
Sweden	23 (3.4)	522 (5.7)	53 (4.3)	522 (3.8)	24 (3.7)	509 (7.4)	9.3 (0.13)
Italy	23 (2.6)	517 (5.9)	43 (4.0)	504 (3.2)	34 (3.9)	504 (5.4)	9.3 (0.12)
Japan	22 (3.0)	592 (4.4)	60 (3.6)	592 (2.3)	18 (2.7)	596 (5.3)	9.6 (0.12)
Denmark	20 (3.4)	539 (5.0)	53 (4.1)	536 (4.2)	27 (3.4)	541 (4.9)	9.3 (0.13)
Hungary	20 (3.2)	511 (8.6)	47 (4.0)	528 (6.1)	33 (3.7)	538 (6.3)	9.1 (0.15)
South Africa (5)	18 (2.4)	447 (12.6)	34 (3.4)	384 (6.1)	48 (3.2)	343 (4.5)	8.6 (0.12)
France	18 (2.7)	502 (4.9)	55 (3.6)	484 (3.7)	28 (3.2)	487 (6.3)	9.2 (0.14)
Iran, Islamic Rep. of	17 (2.2)	466 (7.7)	58 (3.6)	432 (4.8)	25 (3.2)	408 (7.6)	9.1 (0.10)
Morocco	14 (2.3)	428 (8.8)	30 (2.9)	372 (5.7)	56 (3.3)	366 (5.5)	8.2 (0.15)
Indonesia	12 (2.6)	429 (10.2)	27 (3.2)	406 (7.4)	61 (3.3)	387 (5.3)	8.0 (0.15)
International Avg.	37 (0.5)	512 (0.8)	43 (0.5)	505 (0.7)	20 (0.4)	499 (1.1)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.8: Problems with School Conditions and Resources – Teachers' Reports (Continued)

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	69 (1.5)	521 (2.5)	30 (1.6)	488 (4.0)	1 (0.5)	~ ~	11.5 (0.07)
Abu Dhabi, UAE	50 (5.0)	415 (10.1)	35 (4.5)	433 (10.5)	15 (3.2)	393 (17.7)	10.6 (0.20)
Florida, US r	42 (5.7)	554 (9.1)	40 (5.3)	540 (8.2)	19 (5.3)	548 (12.7)	10.1 (0.26)
Norway (4)	40 (3.9)	497 (3.0)	49 (3.9)	494 (3.6)	11 (2.5)	490 (6.9)	10.1 (0.12)
Ontario, Canada	36 (3.7)	518 (4.0)	52 (4.0)	512 (3.0)	12 (2.4)	508 (6.3)	10.1 (0.12)
Quebec, Canada	33 (4.6)	538 (5.9)	53 (5.6)	532 (5.2)	14 (4.1)	547 (9.5)	9.9 (0.17)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x

In your current school, how severe is each problem?

	Not a problem	Minor problem	Moderate problem	Serious problem
1) The school building needs significant repair	○	○	○	○
2) Teachers do not have adequate workspace (e.g., for preparation, collaboration, or meeting with students)	○	○	○	○
3) Teachers do not have adequate instructional materials and supplies	○	○	○	○
4) The school classrooms are not cleaned often enough	○	○	○	○
5) The school classrooms need maintenance work	○	○	○	○
6) Teachers do not have adequate technological resources	○	○	○	○
7) Teachers do not have adequate support for using technology	○	○	○	○

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 5.9: Problems with School Conditions and Resources – Teachers' Reports

Reported by Teachers

Students were scored according to their teachers' responses concerning seven conditions and resources on the *Problems with School Conditions and Resources* scale. Students whose teachers reported **Hardly Any Problems** with their school conditions and resources had a score on the scale of at least 10.9, which corresponds to their teachers reporting "not a problem" for four of seven conditions and resources and "minor problem" for the other three, on average. Students whose teachers reported **Moderate to Severe Problems** had a score no higher than 8.5, which corresponds to their teachers reporting "moderate problem" for four of seven conditions and resources and "minor problem" for the other three, on average. All other students had teachers that reported **Minor Problems** with their school conditions and resources.

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Qatar	69 (3.5)	429 (4.1)	23 (2.5)	457 (9.2)	8 (2.8)	438 (8.1)	11.7 (0.16)
United Arab Emirates	56 (2.6)	478 (3.6)	37 (2.4)	452 (5.1)	7 (1.3)	441 (8.7)	11.2 (0.10)
Bahrain	52 (3.1)	460 (2.9)	40 (3.2)	451 (3.0)	7 (1.8)	431 (8.5)	11.0 (0.10)
Singapore	50 (2.9)	621 (5.1)	44 (2.9)	621 (5.1)	5 (1.1)	598 (16.1)	10.9 (0.10)
Australia	50 (3.3)	519 (3.8)	44 (3.5)	496 (4.9)	6 (1.4)	500 (13.9)	10.9 (0.10)
England	49 (4.6)	523 (8.3)	44 (4.3)	514 (8.3)	7 (2.0)	498 (21.8)	10.8 (0.15)
United States	49 (2.8)	522 (4.5)	41 (2.3)	514 (4.7)	10 (2.1)	517 (9.4)	10.7 (0.12)
Chile	48 (3.8)	442 (5.5)	38 (3.5)	424 (8.1)	14 (2.8)	402 (7.2)	10.6 (0.17)
Ireland	45 (3.6)	527 (4.4)	42 (3.4)	519 (5.0)	12 (2.3)	521 (6.8)	10.6 (0.14)
Canada	45 (3.2)	535 (3.3)	46 (3.2)	525 (3.8)	9 (1.7)	534 (5.8)	10.6 (0.11)
Lebanon	45 (4.6)	451 (5.8)	37 (4.1)	438 (6.1)	19 (3.2)	426 (11.9)	10.4 (0.18)
Slovenia	45 (3.2)	518 (2.8)	43 (3.2)	515 (3.9)	13 (2.2)	514 (5.4)	10.7 (0.14)
New Zealand	41 (3.7)	497 (7.3)	49 (3.8)	495 (4.7)	10 (1.5)	470 (13.8)	10.5 (0.10)
Kuwait	40 (3.9)	394 (8.8)	37 (3.7)	393 (9.4)	23 (3.2)	386 (6.6)	10.2 (0.16)
Kazakhstan	40 (4.0)	533 (7.5)	37 (3.9)	534 (8.5)	23 (3.1)	507 (12.9)	10.3 (0.17)
Malta	39 (0.1)	502 (1.7)	48 (0.1)	493 (1.5)	13 (0.1)	475 (3.2)	10.5 (0.00)
Hong Kong SAR	39 (4.6)	597 (9.5)	52 (4.8)	595 (6.7)	9 (2.4)	569 (16.6)	10.7 (0.15)
Chinese Taipei	38 (3.7)	615 (5.1)	51 (4.1)	591 (4.1)	11 (2.5)	585 (9.2)	10.4 (0.12)
Oman	37 (3.3)	407 (5.5)	47 (3.5)	404 (3.6)	16 (2.4)	393 (6.8)	10.5 (0.15)
Russian Federation	34 (3.7)	544 (6.3)	50 (3.5)	537 (5.7)	16 (2.5)	530 (11.5)	10.1 (0.11)
Korea, Rep. of	33 (3.4)	612 (4.4)	51 (3.4)	603 (4.1)	16 (2.6)	603 (7.8)	10.3 (0.14)
Lithuania	30 (4.0)	515 (6.8)	59 (4.6)	511 (3.9)	10 (2.4)	495 (9.4)	10.2 (0.14)
Israel	29 (2.7)	509 (8.3)	46 (2.5)	519 (6.9)	25 (2.2)	497 (7.8)	9.8 (0.12)
Norway (9)	29 (3.2)	518 (5.0)	53 (3.9)	512 (2.7)	18 (3.2)	506 (3.2)	10.1 (0.12)
Iran, Islamic Rep. of	28 (3.4)	466 (10.1)	41 (3.5)	437 (7.3)	30 (2.9)	408 (5.8)	9.6 (0.13)
Thailand	27 (3.4)	438 (9.6)	59 (4.0)	433 (6.6)	14 (2.6)	414 (11.7)	10.0 (0.13)
Sweden	26 (3.8)	498 (6.2)	53 (4.4)	505 (4.1)	22 (3.3)	493 (6.0)	9.8 (0.14)
Jordan	25 (2.9)	412 (7.4)	37 (3.5)	385 (3.8)	38 (3.3)	369 (5.4)	9.4 (0.13)
Hungary	22 (3.2)	517 (12.1)	49 (3.7)	508 (6.1)	28 (3.4)	523 (6.9)	9.7 (0.13)
Georgia	22 (3.6)	463 (6.3)	44 (4.3)	452 (5.0)	34 (3.6)	448 (7.5)	9.5 (0.14)
Saudi Arabia	20 (3.6)	386 (8.5)	41 (4.3)	367 (6.9)	39 (4.6)	357 (6.6)	9.3 (0.19)
South Africa (9)	18 (3.1)	444 (11.4)	29 (3.4)	384 (9.0)	53 (3.9)	342 (3.3)	8.6 (0.18)
Italy	17 (3.0)	486 (8.3)	51 (4.1)	501 (4.1)	32 (3.5)	485 (5.5)	9.4 (0.12)
Japan	17 (2.6)	587 (6.0)	60 (3.5)	586 (3.4)	22 (2.9)	588 (5.1)	9.5 (0.10)
Turkey	16 (2.6)	481 (12.9)	36 (3.4)	461 (7.1)	48 (3.7)	447 (6.6)	8.8 (0.15)
Egypt	15 (2.3)	417 (6.5)	39 (3.5)	392 (7.5)	46 (3.4)	383 (5.8)	8.8 (0.11)
Malaysia	13 (2.9)	477 (13.9)	52 (4.4)	466 (5.6)	34 (4.3)	461 (6.7)	9.1 (0.14)
Morocco	12 (2.0)	405 (6.0)	41 (3.1)	387 (3.8)	47 (3.0)	377 (3.4)	8.9 (0.09)
Botswana (9)	2 (1.1)	~ ~	20 (3.2)	402 (5.9)	77 (3.4)	387 (2.5)	7.6 (0.11)
International Avg.	34 (0.5)	493 (1.2)	44 (0.6)	481 (0.9)	22 (0.5)	470 (1.5)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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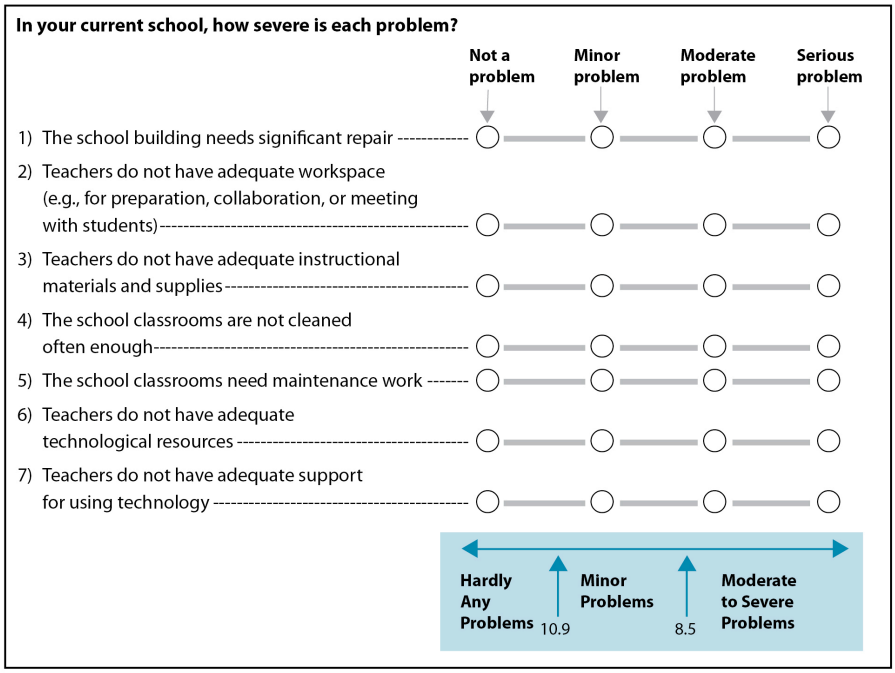
Exhibit 5.9: Problems with School Conditions and Resources – Teachers' Reports (Continued)

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	68 (2.1)	526 (3.3)	29 (2.1)	488 (5.1)	2 (0.5)	~ ~	11.8 (0.09)
Abu Dhabi, UAE	50 (4.7)	447 (8.8)	42 (4.8)	435 (12.2)	9 (2.6)	447 (16.9)	10.9 (0.18)
Quebec, Canada	50 (5.3)	554 (4.8)	40 (5.0)	545 (7.0)	11 (2.5)	545 (9.2)	11.0 (0.21)
Florida, US r	45 (7.7)	512 (10.7)	47 (8.1)	498 (12.5)	8 (3.4)	455 (13.5)	10.7 (0.27)
Ontario, Canada	41 (4.5)	528 (3.9)	49 (4.3)	520 (5.0)	10 (2.6)	528 (7.0)	10.4 (0.15)
Norway (8)	34 (4.1)	488 (3.9)	53 (4.0)	488 (2.3)	13 (2.7)	481 (6.5)	10.2 (0.14)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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TIMSS 2015

CHAPTER 6: SCHOOL CLIMATE

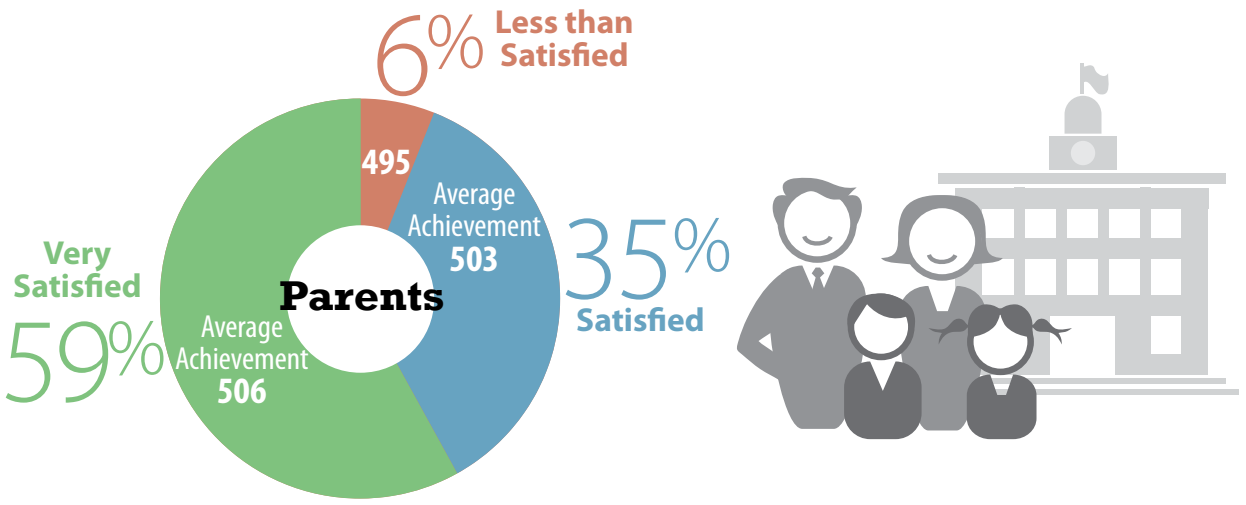
TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

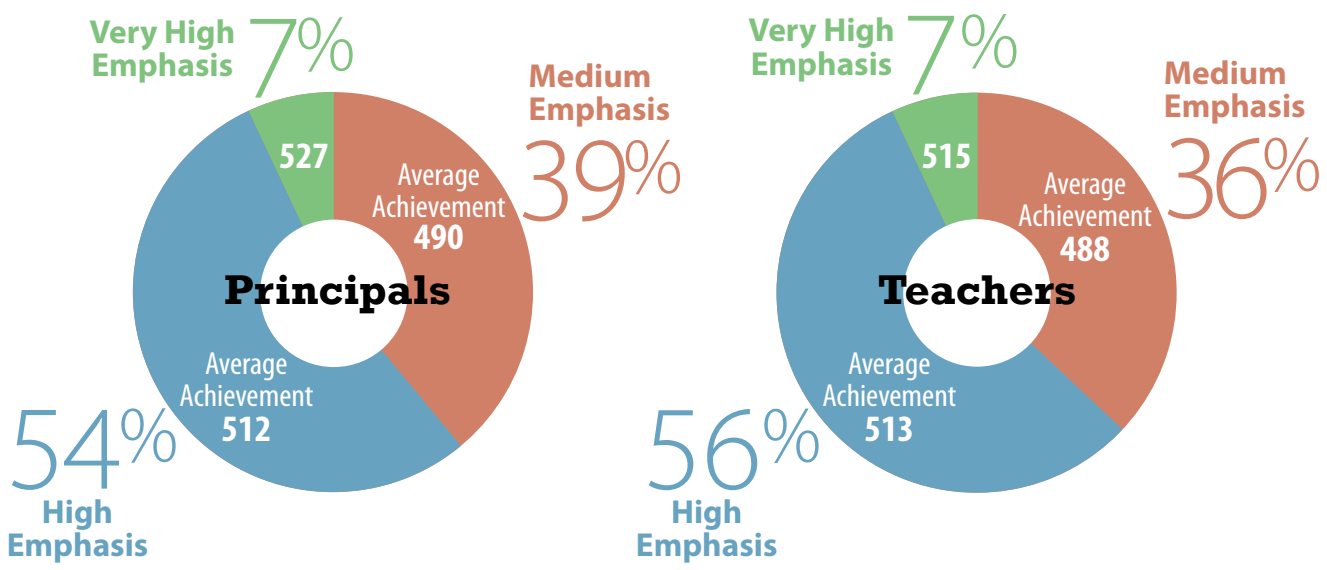
Schools Have Positive Environments

Generally, fourth grade students were in positive school environments, according to their parents, principals, teachers, and the students themselves.

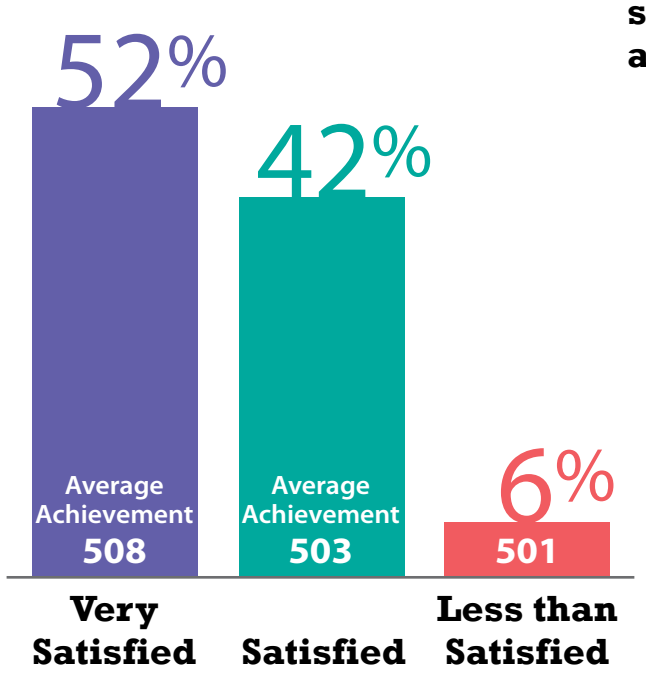
The majority of PARENTS are very satisfied with the performance of their child's school.



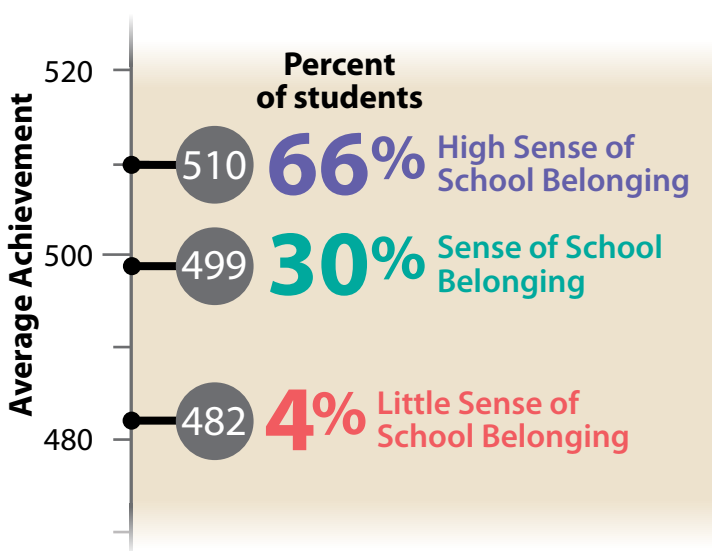
PRINCIPALS and TEACHERS agree that the schools emphasize academic success.



TEACHERS of fourth grade mathematics reported a high degree of job satisfaction.



Almost all FOURTH GRADE STUDENTS reported a positive sense of school belonging, and a higher sense of school belonging was related to higher average mathematics achievement.



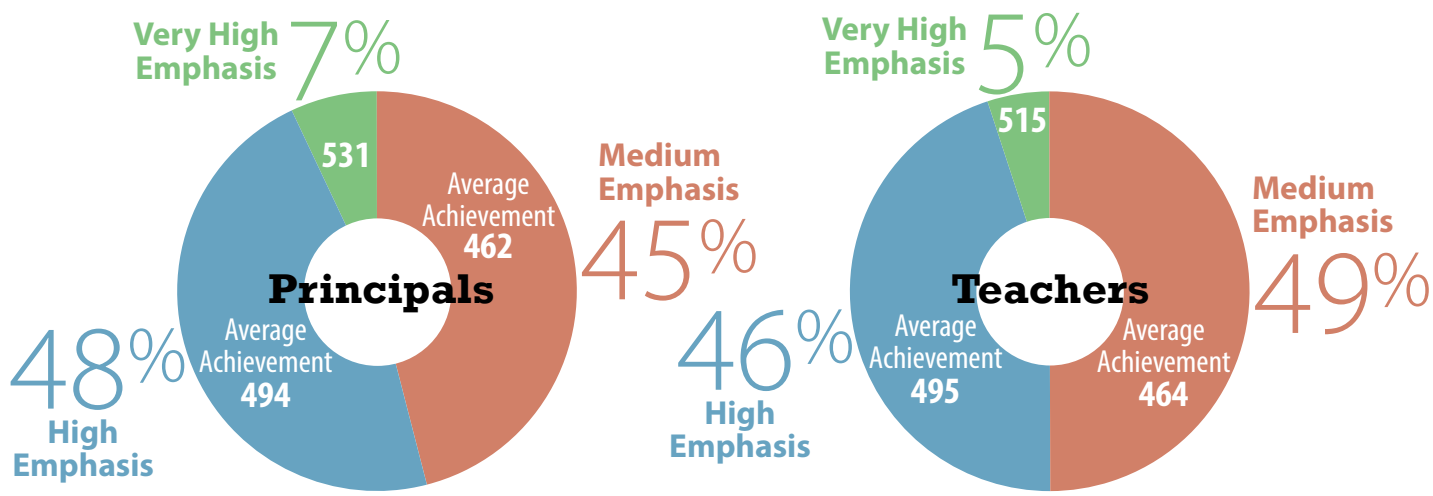
SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

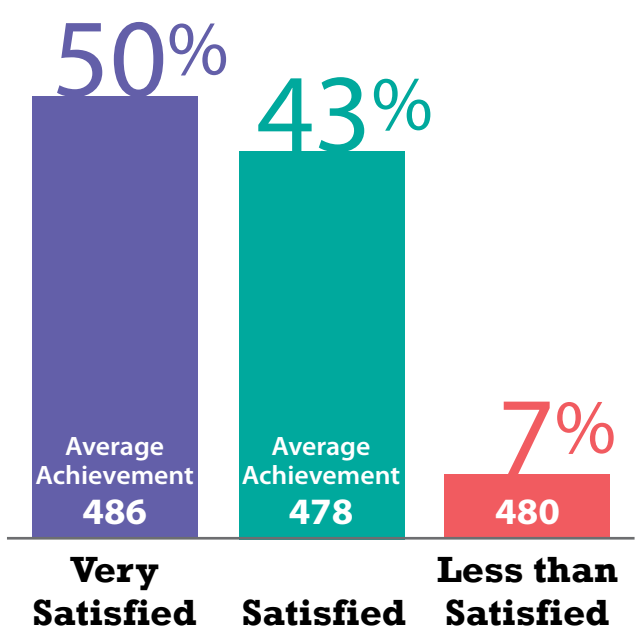
Schools Have Positive Environments

Generally, eighth grade students were in positive school environments, according to their principals, teachers, and the students themselves.

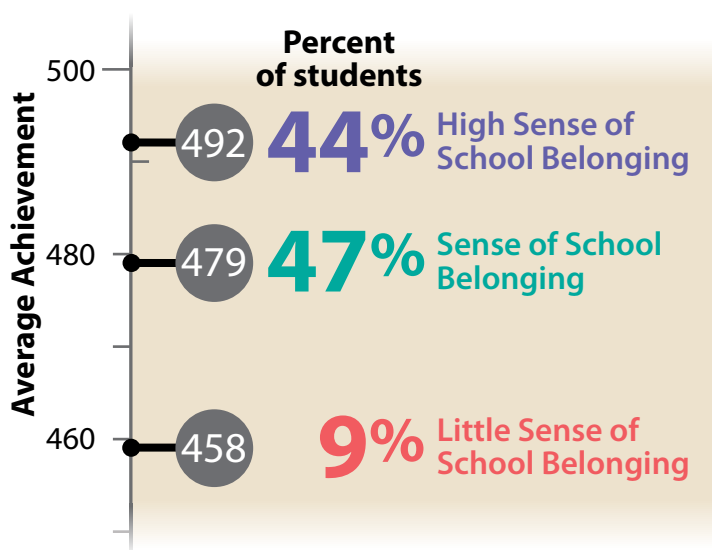
PRINCIPALS and TEACHERS agree that the schools emphasize academic success.



TEACHERS of eighth grade mathematics reported a high degree of job satisfaction.



EIGHTH GRADE STUDENTS were positive about their schools, evenly divided between having a high sense and a sense of school belonging. A higher sense of school belonging was related to higher average mathematics achievement.



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

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Exhibit 6.1: Parents' Perceptions of School Performance

Reported by Parents

Students were scored on the *Parents' Perceptions of School Performance* scale according to their parents' responses to eight statements about the school. Students whose parents are **Very Satisfied** had a score on the scale of at least 9.7, which corresponds to their parents "agreeing a lot" with four of the eight statements and "agreeing a little" with the other four, on average. Students whose parents are **Less than Satisfied** had a score no higher than 6.7, which corresponds to their parents "disagreeing a little" with four of the eight statements and "agreeing a little" with the other four, on average. All other students had parents who were **Satisfied**.

Country		Very Satisfied		Satisfied		Less than Satisfied		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Kazakhstan		91 (0.8)	546 (4.6)	8 (0.7)	539 (8.7)	1 (0.2)	~ ~	11.7 (0.04)
Indonesia		90 (0.8)	399 (3.6)	10 (0.8)	394 (7.8)	1 (0.1)	~ ~	11.4 (0.05)
Northern Ireland	s	81 (1.4)	584 (4.1)	16 (1.3)	590 (5.9)	3 (0.6)	581 (15.5)	11.0 (0.07)
South Africa (5)		80 (0.9)	384 (3.5)	17 (0.8)	361 (5.5)	2 (0.2)	~ ~	11.0 (0.04)
Ireland		80 (1.2)	550 (2.4)	18 (1.0)	553 (3.2)	2 (0.4)	~ ~	10.9 (0.06)
Bulgaria		76 (1.2)	526 (5.4)	20 (1.0)	525 (6.7)	4 (0.4)	521 (9.5)	10.8 (0.06)
Turkey		75 (1.1)	483 (3.5)	21 (0.8)	487 (4.4)	4 (0.4)	488 (7.8)	10.7 (0.05)
Oman		73 (0.7)	434 (2.8)	24 (0.7)	412 (3.5)	3 (0.2)	377 (8.2)	10.6 (0.03)
Georgia		70 (1.2)	466 (3.6)	28 (1.2)	461 (5.2)	1 (0.2)	~ ~	10.6 (0.05)
Portugal		68 (1.2)	546 (2.3)	28 (1.0)	536 (3.4)	4 (0.4)	524 (6.7)	10.4 (0.05)
Lithuania		68 (1.1)	540 (2.8)	29 (1.0)	537 (3.6)	3 (0.4)	530 (10.0)	10.3 (0.05)
Spain		67 (1.4)	510 (2.3)	28 (1.2)	509 (2.7)	5 (0.5)	495 (6.4)	10.4 (0.06)
Chile	r	67 (1.5)	465 (2.8)	28 (1.3)	464 (3.5)	5 (0.5)	449 (6.8)	10.3 (0.07)
Bahrain		66 (0.7)	462 (1.7)	28 (0.6)	441 (3.4)	5 (0.3)	424 (4.5)	10.3 (0.03)
Saudi Arabia		66 (1.3)	389 (3.8)	28 (1.1)	375 (5.5)	6 (0.5)	388 (9.4)	10.4 (0.06)
Serbia		66 (1.3)	514 (4.4)	27 (1.0)	530 (3.9)	8 (0.6)	517 (6.4)	10.3 (0.06)
Morocco		65 (1.3)	389 (3.7)	29 (1.1)	367 (4.9)	5 (0.6)	337 (8.9)	10.2 (0.06)
Qatar	r	65 (1.2)	454 (3.9)	29 (1.1)	438 (4.0)	6 (0.4)	406 (9.1)	10.3 (0.05)
Italy		64 (1.3)	510 (2.9)	30 (1.1)	510 (3.1)	5 (0.5)	491 (6.3)	10.2 (0.06)
Cyprus		64 (1.3)	526 (2.6)	30 (1.0)	529 (4.0)	6 (0.5)	520 (7.7)	10.1 (0.05)
Iran, Islamic Rep. of		64 (1.0)	432 (3.6)	32 (0.9)	431 (4.5)	4 (0.4)	438 (8.7)	10.1 (0.04)
New Zealand	s	63 (1.2)	514 (3.0)	32 (1.1)	511 (3.6)	6 (0.5)	484 (9.7)	10.1 (0.05)
Slovak Republic		62 (1.1)	496 (3.1)	34 (1.0)	508 (2.7)	4 (0.4)	500 (7.0)	10.2 (0.05)
Canada	r	60 (1.0)	518 (2.1)	36 (0.8)	521 (2.7)	5 (0.3)	501 (5.3)	10.1 (0.04)
Hungary		59 (1.1)	533 (3.3)	35 (1.0)	527 (4.3)	6 (0.5)	512 (7.5)	10.0 (0.05)
Jordan		59 (1.3)	403 (4.3)	30 (0.9)	383 (3.7)	11 (0.7)	348 (6.7)	9.9 (0.07)
Kuwait	r	58 (1.3)	364 (4.9)	32 (1.0)	355 (5.4)	10 (0.6)	342 (7.4)	9.9 (0.06)
Singapore		58 (0.8)	623 (4.0)	37 (0.7)	616 (3.7)	5 (0.3)	590 (7.4)	10.0 (0.03)
United Arab Emirates		56 (0.7)	469 (2.7)	38 (0.7)	439 (2.9)	6 (0.2)	419 (5.0)	10.0 (0.03)
Hong Kong SAR		55 (1.4)	622 (3.4)	40 (1.1)	611 (3.4)	5 (0.6)	592 (7.4)	9.9 (0.06)
Finland		54 (1.2)	537 (2.3)	42 (1.1)	538 (2.3)	4 (0.5)	536 (8.7)	9.8 (0.05)
Russian Federation		54 (1.3)	564 (3.7)	41 (1.0)	566 (3.9)	5 (0.6)	559 (6.9)	9.8 (0.06)
Belgium (Flemish)		49 (1.1)	548 (2.6)	47 (1.0)	550 (2.1)	4 (0.4)	533 (7.0)	9.6 (0.04)
Poland		49 (1.3)	533 (2.8)	47 (1.2)	539 (2.5)	5 (0.4)	527 (5.9)	9.7 (0.05)
Chinese Taipei		47 (1.0)	596 (2.6)	46 (0.9)	600 (2.2)	7 (0.4)	591 (4.5)	9.7 (0.04)
Denmark		46 (1.6)	545 (3.5)	42 (1.2)	544 (2.9)	12 (0.9)	523 (6.8)	9.3 (0.07)
Sweden		42 (1.6)	525 (3.8)	51 (1.4)	524 (2.9)	7 (0.7)	514 (6.0)	9.4 (0.07)
Germany	s	42 (1.4)	534 (3.5)	47 (1.2)	537 (2.4)	12 (0.8)	514 (4.7)	9.2 (0.06)
Croatia		39 (1.1)	502 (2.5)	55 (1.1)	504 (2.0)	7 (0.6)	495 (6.4)	9.3 (0.04)
France		35 (1.3)	489 (3.7)	58 (1.2)	493 (3.0)	7 (0.6)	486 (6.7)	9.1 (0.06)
Czech Republic		34 (1.0)	521 (3.5)	53 (0.9)	533 (2.1)	12 (0.8)	534 (3.9)	8.9 (0.05)
Slovenia	s	27 (1.3)	527 (4.3)	64 (1.2)	530 (2.4)	9 (0.5)	521 (6.6)	8.8 (0.05)
Korea, Rep. of		17 (0.9)	616 (3.1)	67 (1.0)	609 (2.5)	16 (0.8)	603 (3.5)	8.3 (0.04)
Japan		7 (0.7)	589 (6.2)	66 (0.8)	596 (1.9)	27 (0.9)	591 (3.3)	7.7 (0.04)
Australia		x x	x x	x x	x x	x x	x x	x x
Netherlands		x x	x x	x x	x x	x x	x x	x x
Norway (5)		x x	x x	x x	x x	x x	x x	x x
England		- -	- -	- -	- -	- -	- -	- -
United States		- -	- -	- -	- -	- -	- -	- -
International Avg.		59 (0.2)	506 (0.5)	35 (0.2)	503 (0.6)	6 (0.1)	495 (1.2)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 6.1: Parents' Perceptions of School Performance (Continued)

Country		Very Satisfied		Satisfied		Less than Satisfied		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants								
Dubai, UAE		62 (1.0)	524 (2.1)	33 (1.0)	496 (2.5)	5 (0.3)	485 (6.8)	10.2 (0.04)
Ontario, Canada	r	62 (1.5)	523 (2.5)	32 (1.1)	515 (3.1)	6 (0.6)	498 (6.7)	10.1 (0.07)
Abu Dhabi, UAE	r	50 (1.6)	442 (6.0)	44 (1.5)	410 (5.4)	6 (0.5)	386 (8.5)	9.7 (0.06)
Quebec, Canada	r	48 (1.9)	537 (4.0)	49 (1.8)	543 (5.0)	3 (0.5)	531 (9.6)	9.7 (0.07)
Buenos Aires, Argentina		x x	x x	x x	x x	x x	x x	x x
Norway (4)		x x	x x	x x	x x	x x	x x	x x
Florida, US		- -	- -	- -	- -	- -	- -	- -

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

What do you think of your child's school?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) My child's school does a good job including me in my child's education	○	○	○	○
2) My child's school provides a safe environment	○	○	○	○
3) My child's school cares about my child's progress in school	○	○	○	○
4) My child's school does a good job informing me of his/her progress	○	○	○	○
5) My child's school promotes high academic standards	○	○	○	○
6) My child's school does a good job in helping him/her become better in reading	○	○	○	○
7) My child's school does a good job in helping him/her become better in mathematics	○	○	○	○
8) My child's school does a good job in helping him/her become better in science	○	○	○	○

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Exhibit 6.2: School Emphasis on Academic Success – Principals' Reports

Reported by Principals

Students were scored according to their principals' responses characterizing thirteen aspects on the *School Emphasis on Academic Success* scale. Students in schools where their principals reported a **Very High Emphasis** on academic success had a score on the scale of at least 13.0, which corresponds to their principals characterizing seven of the thirteen aspects as "very high" and the other six as "high," on average. Students in schools with a **Medium Emphasis** on academic success had a score no higher than 9.2, which corresponds to their principals characterizing seven of the thirteen aspects as "medium" and the other six as "high," on average. All other students attended schools with a **High Emphasis** on academic success.

Country	Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Qatar	30 (2.6)	466 (8.0)	58 (3.2)	433 (5.1)	13 (2.6)	401 (9.1)	11.8 (0.14)
Korea, Rep. of	26 (4.2)	626 (6.1)	62 (4.4)	604 (2.1)	13 (2.6)	591 (6.5)	11.8 (0.20)
United Arab Emirates	20 (1.6)	503 (5.5)	59 (2.2)	448 (2.9)	21 (1.6)	393 (5.4)	11.2 (0.08)
Ireland	19 (3.7)	562 (3.9)	70 (4.1)	547 (2.9)	11 (2.4)	522 (6.5)	11.6 (0.15)
Canada	19 (2.0)	537 (5.5)	51 (3.1)	510 (3.3)	30 (2.8)	494 (4.4)	10.7 (0.13)
New Zealand	18 (2.8)	516 (5.3)	61 (3.6)	499 (3.7)	21 (2.6)	454 (6.7)	11.1 (0.13)
Northern Ireland r	15 (3.9)	589 (8.6)	76 (4.6)	569 (4.2)	9 (2.7)	548 (9.8)	11.4 (0.19)
United States	14 (2.2)	586 (7.9)	46 (3.2)	540 (3.8)	40 (2.9)	520 (3.5)	10.3 (0.15)
England	14 (2.5)	576 (7.3)	65 (4.4)	549 (4.1)	21 (3.9)	522 (6.6)	10.8 (0.15)
Australia	12 (2.8)	555 (8.7)	53 (4.1)	525 (4.2)	34 (3.4)	492 (5.5)	10.4 (0.16)
Chinese Taipei	12 (2.5)	613 (5.0)	63 (3.8)	599 (2.7)	25 (3.4)	584 (3.2)	10.6 (0.15)
Kazakhstan	11 (2.7)	557 (14.7)	78 (3.3)	544 (5.0)	11 (2.4)	536 (14.6)	11.1 (0.15)
Singapore	11 (0.0)	653 (13.0)	63 (0.0)	625 (4.2)	27 (0.0)	589 (8.8)	10.6 (0.00)
Bahrain	10 (0.1)	463 (2.8)	66 (0.2)	455 (2.3)	24 (0.2)	430 (2.2)	10.5 (0.00)
Kuwait	9 (3.3)	398 (20.5)	51 (4.0)	359 (5.3)	40 (3.1)	328 (5.7)	9.8 (0.20)
Cyprus	9 (3.2)	535 (6.7)	51 (5.2)	531 (4.4)	40 (4.3)	511 (3.4)	10.0 (0.16)
Oman	8 (2.0)	411 (8.8)	67 (3.0)	430 (3.3)	25 (3.0)	418 (5.6)	10.4 (0.13)
Hong Kong SAR	7 (2.7)	660 (8.2)	55 (4.7)	619 (5.0)	38 (4.0)	599 (4.6)	10.0 (0.18)
Saudi Arabia	7 (1.8)	404 (6.7)	56 (3.8)	388 (5.7)	37 (3.5)	372 (7.6)	9.9 (0.13)
Georgia	7 (2.4)	486 (13.0)	61 (4.2)	467 (5.6)	32 (4.0)	452 (6.1)	10.1 (0.15)
Croatia	6 (2.0)	505 (7.6)	70 (3.4)	503 (2.3)	23 (3.1)	499 (5.0)	10.7 (0.13)
Bulgaria	6 (2.7)	556 (10.3)	50 (4.7)	542 (5.7)	44 (4.4)	499 (8.9)	9.6 (0.20)
Iran, Islamic Rep. of	6 (1.6)	442 (21.9)	56 (3.4)	441 (4.9)	37 (2.9)	415 (5.3)	10.0 (0.12)
Jordan	5 (1.7)	423 (18.4)	44 (3.5)	402 (5.8)	51 (3.7)	373 (5.7)	9.5 (0.15)
Indonesia	5 (1.5)	381 (33.0)	57 (3.7)	408 (4.6)	38 (3.5)	383 (6.6)	10.0 (0.12)
Spain	5 (1.5)	525 (7.7)	59 (3.8)	517 (2.2)	36 (3.1)	484 (4.3)	9.8 (0.10)
South Africa (5)	5 (1.4)	429 (34.6)	36 (3.7)	378 (10.0)	59 (3.8)	370 (5.1)	9.2 (0.13)
Turkey	4 (1.2)	551 (15.8)	40 (3.7)	508 (5.3)	56 (3.6)	460 (4.0)	9.2 (0.13)
Denmark r	4 (1.5)	555 (16.5)	57 (4.3)	544 (3.6)	39 (4.1)	535 (4.3)	9.7 (0.14)
Sweden	4 (1.6)	550 (4.6)	59 (4.4)	526 (3.1)	37 (4.2)	505 (5.3)	9.9 (0.14)
Portugal	3 (1.7)	559 (11.8)	37 (3.9)	555 (3.9)	59 (3.7)	532 (3.1)	9.1 (0.13)
Japan	3 (1.5)	622 (16.0)	46 (4.1)	597 (2.7)	50 (4.2)	588 (2.3)	9.4 (0.13)
Lithuania	3 (1.2)	559 (17.7)	76 (3.3)	539 (3.1)	20 (3.0)	519 (6.8)	10.3 (0.10)
Serbia	3 (1.3)	552 (15.4)	40 (3.9)	535 (4.6)	57 (4.0)	505 (4.8)	9.2 (0.12)
Morocco	2 (1.0)	~ ~	19 (1.8)	412 (6.8)	79 (1.7)	367 (4.3)	8.2 (0.09)
Chile	2 (0.9)	~ ~	30 (3.7)	478 (5.5)	69 (3.8)	449 (4.0)	8.5 (0.16)
Poland	1 (0.9)	~ ~	63 (3.8)	541 (2.5)	36 (3.8)	524 (4.0)	9.9 (0.11)
Finland	1 (0.9)	~ ~	67 (4.1)	536 (2.5)	32 (4.0)	534 (3.9)	10.0 (0.11)
Slovak Republic	1 (0.8)	~ ~	42 (3.5)	516 (3.6)	57 (3.5)	484 (4.3)	9.1 (0.09)
Germany	1 (0.6)	~ ~	55 (3.0)	529 (2.5)	45 (2.9)	511 (4.0)	9.6 (0.08)
Russian Federation	1 (0.5)	~ ~	55 (3.7)	570 (5.1)	45 (3.7)	557 (4.0)	9.4 (0.07)
Hungary	0 (0.2)	~ ~	46 (3.9)	553 (4.1)	53 (3.9)	508 (4.9)	9.2 (0.11)
Belgium (Flemish)	0 (0.0)	~ ~	49 (4.1)	557 (2.9)	51 (4.1)	538 (3.7)	9.3 (0.09)
Czech Republic	0 (0.0)	~ ~	33 (4.4)	534 (4.3)	67 (4.4)	525 (2.3)	8.8 (0.12)
France	0 (0.0)	~ ~	59 (4.3)	495 (3.8)	41 (4.3)	477 (5.7)	9.6 (0.11)
Italy	0 (0.0)	~ ~	45 (4.3)	509 (4.1)	55 (4.3)	506 (3.5)	9.1 (0.11)
Netherlands s	0 (0.0)	~ ~	46 (5.5)	537 (3.3)	54 (5.5)	533 (2.2)	9.3 (0.13)
Norway (5)	0 (0.0)	~ ~	48 (4.6)	558 (3.4)	52 (4.6)	541 (3.9)	9.4 (0.13)
Slovenia	0 (0.0)	~ ~	51 (4.1)	522 (2.4)	49 (4.1)	519 (3.2)	9.3 (0.11)
International Avg.	7 (0.3)	527 (2.4)	54 (0.5)	512 (0.6)	39 (0.5)	490 (0.8)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 6.2: School Emphasis on Academic Success – Principals' Reports (Continued)

Country	Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	42 (0.2)	533 (2.4)	47 (0.2)	502 (1.9)	11 (0.1)	445 (3.2)	12.3 (0.01)
Quebec, Canada	41 (5.7)	545 (6.2)	53 (5.5)	533 (5.3)	7 (2.5)	518 (6.5)	12.5 (0.18)
Abu Dhabi, UAE	10 (2.6)	459 (21.5)	56 (4.3)	432 (6.6)	35 (4.1)	368 (8.2)	10.3 (0.18)
Ontario, Canada	9 (2.6)	547 (11.0)	45 (5.2)	515 (3.6)	46 (5.3)	502 (3.1)	9.9 (0.21)
Buenos Aires, Argentina s	6 (2.7)	463 (8.8)	47 (4.6)	450 (4.9)	46 (4.9)	412 (5.9)	9.7 (0.23)
Florida, US r	3 (2.7)	580 (7.7)	59 (7.0)	550 (6.4)	38 (6.4)	539 (9.7)	10.2 (0.24)
Norway (4)	0 (0.0)	~ ~	47 (4.8)	503 (3.1)	53 (4.8)	485 (3.7)	9.3 (0.14)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How would you characterize each of the following within your school?

	Very high	High	Medium	Low	Very low
1) Teachers' understanding of the school's curricular goals	○	○	○	○	○
2) Teachers' degree of success in implementing the school's curriculum	○	○	○	○	○
3) Teachers' expectations for student achievement	○	○	○	○	○
4) Teachers working together to improve student achievement	○	○	○	○	○
5) Teachers' ability to inspire students	○	○	○	○	○
6) Parental involvement in school activities	○	○	○	○	○
7) Parental commitment to ensure that students are ready to learn	○	○	○	○	○
8) Parental expectations for student achievement	○	○	○	○	○
9) Parental support for student achievement	○	○	○	○	○
10) Parental pressure for the school to maintain high academic standards	○	○	○	○	○
11) Students' desire to do well in school	○	○	○	○	○
12) Students' ability to reach school's academic goals	○	○	○	○	○
13) Students' respect for classmates who excel in school	○	○	○	○	○

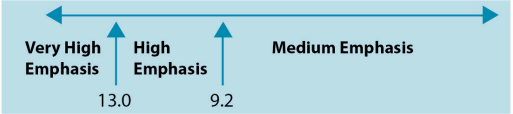

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Exhibit 6.3: School Emphasis on Academic Success – Principals' Reports

Reported by Principals

Students were scored according to their principals' responses characterizing thirteen aspects on the *School Emphasis on Academic Success* scale. Students in schools where their principals reported a **Very High Emphasis** on academic success had a score on the scale of at least 13.1, which corresponds to their principals characterizing seven of the thirteen aspects as "very high" and the other six as "high," on average. Students in schools with a **Medium Emphasis** on academic success had a score no higher than 9.6, which corresponds to their principals characterizing seven of the thirteen aspects as "medium" and the other six as "high," on average. All other students attended schools with a **High Emphasis** on academic success.

Country	Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
England r	26 (3.7)	574 (10.5)	53 (4.8)	521 (6.5)	22 (3.5)	485 (10.3)	11.6 (0.17)
Qatar	25 (0.4)	473 (5.3)	57 (0.5)	433 (3.6)	19 (0.4)	403 (5.4)	11.7 (0.02)
United Arab Emirates	19 (1.7)	520 (5.6)	59 (2.2)	466 (2.9)	22 (1.5)	406 (4.7)	11.2 (0.07)
Korea, Rep. of	17 (3.5)	622 (7.0)	65 (4.3)	607 (3.2)	18 (3.4)	585 (4.2)	11.2 (0.17)
Ireland	15 (2.9)	549 (6.8)	65 (4.0)	526 (2.9)	21 (3.1)	495 (8.1)	11.2 (0.15)
Australia	14 (2.3)	557 (7.4)	42 (3.5)	512 (5.1)	44 (3.0)	486 (4.6)	10.5 (0.11)
Canada	13 (2.1)	556 (6.1)	46 (3.2)	533 (2.9)	41 (3.3)	513 (3.5)	10.6 (0.15)
Bahrain	12 (0.2)	504 (6.0)	52 (0.2)	456 (2.0)	36 (0.2)	435 (2.3)	10.3 (0.01)
Malaysia	10 (2.1)	518 (12.7)	65 (3.6)	465 (4.9)	25 (3.9)	446 (6.9)	11.0 (0.12)
Singapore	10 (0.0)	684 (7.7)	64 (0.0)	626 (4.5)	26 (0.0)	587 (6.0)	10.7 (0.00)
New Zealand	9 (2.8)	523 (14.3)	69 (4.4)	496 (4.5)	22 (3.6)	460 (6.5)	11.0 (0.14)
Kazakhstan	9 (2.6)	538 (20.3)	72 (3.8)	528 (6.7)	19 (3.4)	521 (9.5)	11.0 (0.16)
Malta	8 (0.1)	525 (4.7)	57 (0.1)	506 (1.2)	35 (0.1)	463 (2.0)	10.4 (0.01)
United States	8 (2.0)	564 (10.7)	46 (3.5)	532 (4.3)	46 (3.2)	499 (5.0)	10.0 (0.13)
Chinese Taipei	7 (1.9)	661 (10.0)	46 (3.8)	610 (3.7)	47 (3.5)	579 (4.1)	10.0 (0.13)
Hong Kong SAR	6 (1.2)	629 (12.2)	39 (3.8)	624 (6.3)	56 (3.8)	567 (6.2)	9.7 (0.14)
Sweden	5 (1.9)	531 (9.2)	45 (4.4)	511 (4.1)	50 (4.2)	488 (4.2)	9.9 (0.13)
Saudi Arabia	5 (1.7)	397 (18.5)	43 (4.1)	385 (6.9)	52 (4.2)	352 (4.9)	9.8 (0.15)
Oman	5 (1.3)	425 (17.1)	57 (2.9)	409 (4.0)	38 (2.6)	390 (3.4)	10.2 (0.09)
Kuwait	5 (1.7)	442 (36.4)	53 (4.1)	407 (7.2)	42 (3.9)	369 (5.2)	10.0 (0.13)
Iran, Islamic Rep. of	5 (1.0)	533 (27.1)	43 (3.0)	455 (6.5)	53 (3.2)	412 (4.2)	9.6 (0.12)
Thailand	5 (1.5)	466 (34.6)	61 (4.0)	443 (6.3)	34 (3.8)	406 (5.6)	10.3 (0.14)
Israel	4 (1.6)	586 (17.4)	56 (3.6)	522 (6.0)	39 (3.3)	486 (8.2)	10.2 (0.11)
Turkey	4 (1.3)	600 (13.8)	29 (3.1)	486 (7.9)	67 (3.3)	437 (4.4)	8.9 (0.14)
Lebanon	4 (1.7)	496 (18.7)	53 (4.4)	456 (5.7)	43 (4.0)	422 (5.3)	10.0 (0.13)
Jordan	3 (1.0)	424 (17.4)	40 (3.7)	406 (4.9)	57 (3.7)	369 (4.2)	9.4 (0.12)
Egypt	3 (0.9)	431 (30.8)	33 (3.5)	401 (7.6)	64 (3.6)	385 (4.9)	9.5 (0.11)
Chile	2 (1.1)	~ ~	29 (3.4)	462 (7.6)	69 (3.6)	411 (4.3)	8.7 (0.16)
Japan	2 (1.2)	~ ~	53 (4.0)	600 (3.3)	45 (4.0)	568 (3.2)	9.8 (0.12)
Lithuania	2 (1.1)	~ ~	58 (3.7)	520 (4.0)	40 (3.8)	498 (3.9)	9.9 (0.10)
South Africa (9)	1 (0.5)	~ ~	27 (3.5)	397 (12.5)	72 (3.5)	361 (4.2)	8.7 (0.13)
Georgia	1 (0.6)	~ ~	57 (4.3)	456 (4.8)	42 (4.3)	450 (5.0)	9.9 (0.11)
Slovenia	1 (0.9)	~ ~	38 (4.6)	525 (4.1)	61 (4.5)	511 (2.7)	9.5 (0.11)
Hungary	1 (0.9)	~ ~	64 (3.9)	534 (4.4)	35 (3.9)	472 (7.4)	10.1 (0.10)
Norway (9)	1 (0.8)	~ ~	52 (4.1)	521 (3.3)	47 (4.0)	500 (2.6)	9.9 (0.12)
Botswana (9)	1 (0.0)	~ ~	12 (2.7)	429 (7.7)	88 (2.7)	385 (2.2)	7.7 (0.13)
Italy	1 (0.7)	~ ~	29 (3.6)	500 (5.4)	71 (3.7)	491 (3.3)	9.0 (0.12)
Morocco	0 (0.2)	~ ~	12 (1.8)	426 (10.2)	88 (1.8)	379 (2.3)	7.8 (0.10)
Russian Federation	0 (0.0)	~ ~	27 (3.1)	554 (6.0)	73 (3.1)	532 (5.8)	9.1 (0.08)
International Avg.	7 (0.3)	531 (3.2)	48 (0.6)	494 (0.9)	45 (0.5)	462 (0.8)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 6.3: School Emphasis on Academic Success – Principals' Reports (Continued)

Country	Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	42 (0.3)	540 (4.3)	48 (0.4)	506 (2.2)	10 (0.2)	437 (6.5)	12.5 (0.02)
Quebec, Canada	27 (4.2)	569 (5.1)	54 (5.6)	543 (4.3)	18 (4.4)	534 (8.9)	11.8 (0.23)
Florida, US s	12 (6.0)	546 (23.8)	35 (9.7)	520 (13.9)	53 (8.8)	475 (13.0)	10.4 (0.44)
Abu Dhabi, UAE	8 (2.5)	484 (24.6)	58 (3.9)	456 (5.3)	34 (3.6)	398 (7.0)	10.4 (0.15)
Ontario, Canada	6 (2.2)	540 (4.5)	42 (4.1)	530 (3.6)	52 (4.2)	511 (4.1)	10.0 (0.19)
Norway (8)	1 (0.8)	~ ~	52 (4.0)	497 (2.8)	47 (3.9)	477 (2.4)	9.9 (0.12)
Buenos Aires, Argentina r	1 (0.7)	~ ~	26 (4.5)	444 (10.2)	74 (4.6)	379 (6.4)	8.9 (0.16)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How would you characterize each of the following within your school?

	Very high	High	Medium	Low	Very low
1) Teachers' understanding of the school's curricular goals	○	○	○	○	○
2) Teachers' degree of success in implementing the school's curriculum	○	○	○	○	○
3) Teachers' expectations for student achievement	○	○	○	○	○
4) Teachers working together to improve student achievement	○	○	○	○	○
5) Teachers' ability to inspire students	○	○	○	○	○
6) Parental involvement in school activities	○	○	○	○	○
7) Parental commitment to ensure that students are ready to learn	○	○	○	○	○
8) Parental expectations for student achievement	○	○	○	○	○
9) Parental support for student achievement	○	○	○	○	○
10) Parental pressure for the school to maintain high academic standards	○	○	○	○	○
11) Students' desire to do well in school	○	○	○	○	○
12) Students' ability to reach school's academic goals	○	○	○	○	○
13) Students' respect for classmates who excel in school	○	○	○	○	○

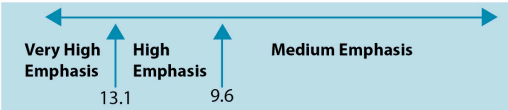

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Exhibit 6.4: School Emphasis on Academic Success – Teachers' Reports

Reported by Teachers

Students were scored according to their teachers' responses characterizing fourteen aspects on the *School Emphasis on Academic Success* scale. Students in schools where their teachers reported a **Very High Emphasis** on academic success had a score on the scale of at least 12.9, which corresponds to their teachers characterizing seven of the fourteen aspects as "very high" and the other seven as "high," on average. Students in schools with a **Medium Emphasis** on academic success had a score no higher than 9.2, which corresponds to their teachers characterizing seven of the fourteen aspects as "medium" and the other seven as "high," on average. All other students attended schools with a **High Emphasis** on academic success.

Country	Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Korea, Rep. of	29 (2.8)	627 (4.7)	57 (3.5)	603 (2.5)	15 (2.7)	590 (4.6)	11.6 (0.15)
Kazakhstan	22 (2.7)	555 (10.5)	69 (2.7)	543 (5.8)	8 (1.6)	528 (11.8)	11.6 (0.15)
Northern Ireland r	22 (3.6)	585 (7.3)	67 (4.4)	574 (4.2)	11 (3.1)	539 (6.6)	11.8 (0.20)
Ireland	20 (3.5)	562 (4.9)	67 (3.9)	548 (2.6)	13 (2.5)	518 (6.4)	11.2 (0.18)
Croatia	19 (3.1)	500 (4.3)	70 (3.8)	502 (2.3)	11 (2.4)	505 (7.1)	11.3 (0.16)
Qatar	19 (3.5)	457 (8.5)	67 (4.5)	440 (5.2)	14 (2.9)	409 (11.0)	11.1 (0.16)
United Arab Emirates	15 (1.7)	482 (7.4)	62 (2.3)	463 (3.7)	23 (1.8)	405 (7.0)	10.8 (0.09)
England	15 (2.7)	575 (9.8)	56 (4.0)	552 (4.0)	29 (3.7)	521 (6.3)	10.7 (0.17)
Canada	13 (1.7)	524 (4.4)	58 (2.7)	518 (2.8)	28 (2.5)	492 (5.5)	10.6 (0.12)
Bahrain	13 (0.8)	457 (9.8)	57 (2.2)	461 (2.0)	29 (2.0)	432 (2.9)	10.5 (0.15)
New Zealand	12 (2.2)	510 (6.4)	68 (2.8)	499 (2.9)	20 (2.2)	454 (6.0)	10.6 (0.11)
Indonesia	11 (2.2)	408 (16.5)	57 (3.4)	407 (4.5)	32 (3.3)	377 (6.9)	10.3 (0.14)
Oman	11 (1.9)	437 (10.2)	66 (3.2)	429 (3.4)	23 (2.7)	413 (5.7)	10.6 (0.11)
Georgia	10 (2.8)	472 (8.8)	72 (3.8)	469 (4.6)	18 (3.1)	437 (8.6)	10.7 (0.14)
Iran, Islamic Rep. of	9 (2.0)	471 (12.6)	57 (3.3)	435 (5.1)	34 (3.2)	414 (5.4)	10.2 (0.15)
Australia	9 (2.2)	555 (7.7)	63 (4.1)	526 (3.5)	28 (4.0)	488 (5.8)	10.4 (0.13)
United States	8 (1.7)	576 (9.7)	51 (2.4)	547 (3.6)	41 (2.2)	520 (3.4)	9.8 (0.11)
Lithuania	8 (2.1)	554 (11.3)	72 (3.7)	540 (3.2)	20 (3.4)	513 (6.8)	10.7 (0.13)
Spain	8 (1.7)	522 (4.7)	62 (3.3)	515 (2.3)	30 (3.5)	479 (5.3)	10.2 (0.12)
South Africa (5)	7 (1.4)	402 (18.4)	58 (3.3)	377 (5.3)	35 (3.2)	373 (6.7)	9.9 (0.13)
Kuwait	6 (2.1)	372 (15.3)	60 (3.2)	364 (7.2)	34 (2.7)	326 (5.2)	10.0 (0.13)
Serbia	6 (1.9)	526 (9.9)	63 (3.7)	525 (4.2)	31 (3.7)	502 (8.1)	10.1 (0.14)
Bulgaria	5 (1.9)	574 (14.7)	61 (3.8)	532 (6.2)	34 (3.7)	503 (8.3)	9.9 (0.14)
Turkey	5 (1.3)	544 (21.0)	45 (3.2)	501 (5.6)	50 (3.5)	461 (4.3)	9.3 (0.14)
Saudi Arabia	4 (1.6)	434 (11.7)	46 (3.8)	395 (6.1)	50 (3.8)	370 (6.3)	9.4 (0.14)
Singapore	4 (1.3)	639 (18.0)	52 (3.0)	637 (4.8)	44 (2.8)	594 (5.6)	9.7 (0.09)
Sweden	4 (1.5)	561 (9.0)	46 (4.2)	522 (3.1)	50 (4.1)	512 (4.5)	9.4 (0.13)
Morocco	4 (1.3)	397 (21.7)	17 (2.8)	430 (7.4)	79 (3.1)	364 (4.1)	8.0 (0.13)
Jordan	4 (1.4)	423 (20.1)	49 (3.9)	402 (5.4)	48 (3.9)	373 (5.1)	9.4 (0.14)
Czech Republic	3 (1.3)	528 (17.8)	44 (3.7)	532 (2.7)	52 (3.5)	525 (4.0)	9.3 (0.11)
Chinese Taipei	3 (1.4)	605 (9.0)	63 (3.6)	600 (2.4)	34 (3.7)	590 (3.9)	9.8 (0.13)
Cyprus	3 (1.3)	552 (20.3)	59 (3.6)	530 (2.6)	38 (3.6)	509 (4.0)	9.9 (0.13)
Italy	3 (1.4)	514 (16.6)	48 (3.7)	509 (3.2)	49 (3.6)	504 (4.0)	9.5 (0.12)
Norway (5)	3 (1.7)	592 (11.6)	52 (4.0)	557 (3.8)	45 (3.8)	539 (2.8)	9.5 (0.11)
Poland	2 (1.0)	~ ~	61 (3.6)	541 (2.3)	37 (3.7)	524 (4.1)	9.8 (0.10)
Denmark	2 (1.2)	~ ~	41 (3.6)	544 (4.5)	57 (3.7)	531 (3.8)	9.1 (0.12)
Finland	2 (0.9)	~ ~	64 (3.3)	538 (2.0)	34 (3.3)	530 (4.1)	9.8 (0.10)
Chile	2 (1.4)	~ ~	36 (4.1)	475 (5.3)	62 (4.3)	451 (3.7)	8.8 (0.19)
Belgium (Flemish)	2 (1.4)	~ ~	47 (3.8)	556 (3.1)	51 (3.7)	536 (2.7)	9.2 (0.12)
Portugal	2 (1.0)	~ ~	54 (3.4)	553 (3.5)	45 (3.2)	527 (4.5)	9.5 (0.10)
Hungary	1 (0.8)	~ ~	47 (3.3)	548 (4.1)	52 (3.4)	510 (4.9)	9.2 (0.12)
Slovak Republic	1 (0.6)	~ ~	49 (3.3)	511 (3.8)	50 (3.2)	485 (4.4)	9.3 (0.09)
Slovenia	1 (0.9)	~ ~	61 (4.0)	521 (2.5)	38 (4.1)	519 (3.4)	9.6 (0.10)
France	1 (0.6)	~ ~	61 (3.3)	498 (3.5)	38 (3.3)	471 (3.6)	9.6 (0.09)
Germany	1 (0.6)	~ ~	58 (3.5)	529 (2.6)	41 (3.4)	510 (4.2)	9.4 (0.11)
Hong Kong SAR	0 (0.4)	~ ~	71 (3.7)	624 (3.9)	29 (3.7)	591 (4.6)	9.9 (0.13)
Russian Federation	0 (0.5)	~ ~	54 (3.9)	570 (3.8)	46 (3.9)	557 (6.5)	9.4 (0.09)
Japan	0 (0.4)	~ ~	46 (3.4)	599 (3.0)	54 (3.4)	588 (2.1)	9.1 (0.09)
Netherlands r	0 (0.3)	~ ~	42 (4.3)	532 (3.2)	57 (4.3)	528 (2.3)	9.1 (0.11)
International Avg.	7 (0.3)	515 (2.2)	56 (0.5)	513 (0.6)	36 (0.5)	488 (0.8)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 6.4: School Emphasis on Academic Success – Teachers' Reports (Continued)

Country	Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Quebec, Canada	24 (5.0)	539 (5.3)	66 (5.2)	536 (5.6)	10 (2.4)	524 (12.0)	11.7 (0.20)
Dubai, UAE	17 (1.9)	542 (8.5)	67 (2.1)	513 (2.7)	16 (2.5)	472 (9.0)	11.2 (0.09)
Florida, US r	14 (3.8)	579 (13.2)	44 (4.7)	561 (5.5)	43 (5.3)	522 (7.0)	9.8 (0.30)
Abu Dhabi, UAE	9 (2.5)	470 (16.0)	58 (4.3)	435 (8.1)	33 (3.9)	378 (10.6)	10.2 (0.15)
Ontario, Canada	8 (2.3)	519 (9.1)	55 (3.4)	521 (3.3)	37 (3.8)	503 (3.8)	10.0 (0.20)
Norway (4)	2 (1.0)	~ ~	59 (4.2)	501 (2.6)	39 (4.2)	487 (4.6)	9.5 (0.13)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x

How would you characterize each of the following within your school?

	Very high	High	Medium	Low	Very low
1) Teachers' understanding of the school's curricular goals	○	○	○	○	○
2) Teachers' degree of success in implementing the school's curriculum	○	○	○	○	○
3) Teachers' expectations for student achievement	○	○	○	○	○
4) Teachers working together to improve student achievement	○	○	○	○	○
5) Teachers' ability to inspire students	○	○	○	○	○
6) Parental involvement in school activities	○	○	○	○	○
7) Parental commitment to ensure that students are ready to learn	○	○	○	○	○
8) Parental expectations for student achievement	○	○	○	○	○
9) Parental support for student achievement	○	○	○	○	○
10) Parental pressure for the school to maintain high academic standards	○	○	○	○	○
11) Students' desire to do well in school	○	○	○	○	○
12) Students' ability to reach school's academic goals	○	○	○	○	○
13) Students' respect for classmates who excel in school	○	○	○	○	○
14) Collaboration between school leadership and teachers to plan instruction	○	○	○	○	○

Very High Emphasis | 12.9 | High Emphasis | 9.2 | Medium Emphasis

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 6.5: School Emphasis on Academic Success – Teachers' Reports

Reported by Teachers

Students were scored according to their teachers' responses characterizing fourteen aspects on the *School Emphasis on Academic Success* scale. Students in schools where their teachers reported a **Very High Emphasis** on academic success had a score on the scale of at least 13.4, which corresponds to their teachers characterizing seven of the fourteen aspects as "very high" and the other seven as "high," on average. Students in schools with a **Medium Emphasis** on academic success had a score no higher than 9.8, which corresponds to their teachers characterizing seven of the fourteen aspects as "medium" and the other seven as "high," on average. All other students attended schools with a **High Emphasis** on academic success.

Country	Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Qatar	18 (3.2)	472 (10.0)	58 (3.7)	444 (4.1)	25 (2.2)	395 (6.1)	11.4 (0.12)
Korea, Rep. of	16 (2.8)	620 (5.7)	57 (3.8)	611 (3.6)	27 (3.2)	587 (4.7)	11.2 (0.16)
United Arab Emirates	15 (1.4)	513 (7.4)	61 (2.4)	468 (3.7)	25 (2.2)	431 (7.3)	11.2 (0.09)
Ireland	12 (1.9)	538 (8.1)	61 (3.0)	535 (3.2)	27 (2.5)	490 (6.4)	11.0 (0.12)
Canada	11 (2.1)	551 (5.3)	55 (3.1)	535 (2.8)	34 (2.6)	516 (4.5)	10.7 (0.12)
Kazakhstan	10 (2.4)	566 (12.4)	71 (3.3)	528 (6.4)	18 (2.9)	507 (10.2)	11.3 (0.15)
Malaysia	10 (2.0)	504 (16.5)	69 (3.6)	467 (5.2)	21 (3.2)	448 (9.7)	11.1 (0.10)
England	9 (2.4)	568 (15.2)	54 (4.0)	528 (6.6)	37 (3.5)	487 (7.7)	10.5 (0.15)
Lebanon	9 (2.5)	463 (12.7)	33 (3.5)	460 (5.7)	58 (3.8)	429 (5.3)	9.8 (0.16)
Oman	9 (1.9)	423 (10.7)	46 (3.0)	413 (3.7)	45 (2.7)	389 (3.7)	10.3 (0.12)
Australia	8 (1.7)	543 (10.5)	48 (3.1)	523 (4.2)	44 (2.9)	484 (4.0)	10.2 (0.15)
South Africa (9)	7 (1.7)	407 (16.2)	37 (3.1)	389 (9.5)	56 (3.3)	358 (4.9)	9.7 (0.15)
Kuwait	6 (2.7)	488 (30.1)	45 (4.7)	394 (5.5)	49 (3.9)	377 (6.0)	10.0 (0.14)
United States	6 (1.2)	558 (11.2)	39 (2.9)	537 (4.8)	55 (3.0)	501 (4.0)	9.8 (0.13)
Thailand	6 (1.1)	455 (34.8)	52 (3.3)	445 (6.8)	43 (3.3)	411 (5.9)	10.2 (0.13)
Iran, Islamic Rep. of	6 (1.6)	513 (19.3)	42 (3.3)	454 (6.9)	53 (3.2)	415 (4.8)	9.7 (0.14)
Malta	5 (0.1)	531 (3.9)	55 (0.1)	503 (1.5)	40 (0.1)	477 (1.7)	10.3 (0.01)
Bahrain	5 (0.7)	495 (19.4)	54 (3.3)	466 (2.8)	41 (3.3)	434 (2.9)	10.3 (0.11)
New Zealand	4 (1.2)	531 (15.0)	59 (2.7)	500 (5.5)	37 (2.6)	478 (5.3)	10.5 (0.10)
Israel	4 (0.9)	533 (10.5)	58 (2.8)	533 (5.6)	38 (2.8)	473 (7.8)	10.4 (0.10)
Singapore	4 (1.1)	643 (22.9)	49 (2.8)	639 (4.9)	47 (2.6)	598 (5.4)	10.1 (0.08)
Turkey	4 (1.3)	547 (24.7)	28 (3.3)	481 (8.1)	68 (3.4)	443 (5.2)	9.2 (0.12)
Lithuania	3 (1.9)	548 (12.8)	58 (4.3)	520 (4.3)	39 (4.0)	493 (4.3)	10.3 (0.11)
Georgia	3 (1.3)	446 (33.5)	57 (4.3)	463 (4.5)	40 (4.3)	440 (5.6)	10.3 (0.12)
Chile	3 (1.3)	495 (14.1)	35 (4.2)	450 (7.4)	62 (4.3)	415 (4.8)	9.2 (0.18)
Egypt	3 (1.2)	443 (32.8)	39 (3.5)	404 (6.6)	59 (3.6)	381 (5.5)	9.6 (0.14)
Chinese Taipei	2 (1.2)	~ ~	45 (3.7)	620 (4.2)	53 (3.5)	579 (3.8)	9.9 (0.13)
Saudi Arabia	2 (0.7)	~ ~	38 (4.4)	372 (7.7)	60 (4.5)	359 (4.7)	9.6 (0.17)
Morocco	2 (0.8)	~ ~	8 (1.5)	411 (8.7)	90 (1.7)	381 (2.3)	7.7 (0.12)
Botswana (9)	1 (0.7)	~ ~	17 (3.5)	419 (6.5)	82 (3.5)	384 (2.4)	8.6 (0.14)
Italy	1 (0.7)	~ ~	32 (3.5)	500 (5.5)	67 (3.6)	492 (2.9)	9.1 (0.11)
Hong Kong SAR	1 (0.8)	~ ~	40 (3.9)	626 (5.6)	59 (3.9)	572 (5.8)	9.5 (0.13)
Jordan	1 (0.9)	~ ~	36 (3.5)	402 (6.4)	63 (3.6)	376 (4.3)	9.4 (0.13)
Norway (9)	1 (0.9)	~ ~	50 (3.4)	520 (3.3)	49 (3.5)	505 (2.8)	9.9 (0.09)
Hungary	1 (0.8)	~ ~	36 (3.4)	550 (5.4)	63 (3.3)	492 (4.4)	9.4 (0.12)
Japan	1 (0.7)	~ ~	46 (3.5)	601 (2.9)	53 (3.5)	574 (3.4)	9.6 (0.11)
Slovenia	1 (0.2)	~ ~	42 (3.4)	519 (4.1)	58 (3.4)	514 (2.5)	9.7 (0.08)
Russian Federation	0 (0.4)	~ ~	35 (3.7)	552 (6.9)	64 (3.8)	529 (5.0)	9.5 (0.09)
Sweden	0 (0.3)	~ ~	42 (3.8)	513 (4.5)	58 (3.8)	491 (3.9)	9.6 (0.10)
International Avg.	5 (0.2)	515 (3.6)	46 (0.5)	495 (0.9)	49 (0.5)	464 (0.8)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 6.5: School Emphasis on Academic Success – Teachers' Reports (Continued)

Country	Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	30 (3.1)	547 (6.6)	57 (3.3)	508 (4.1)	13 (1.4)	457 (7.2)	12.1 (0.11)
Quebec, Canada	27 (4.6)	551 (6.4)	52 (5.7)	554 (5.0)	22 (4.2)	537 (8.4)	11.8 (0.25)
Abu Dhabi, UAE	5 (1.7)	454 (30.0)	59 (5.0)	451 (8.6)	36 (5.0)	423 (12.7)	10.5 (0.16)
Ontario, Canada	4 (2.4)	553 (8.0)	55 (4.1)	531 (3.4)	41 (3.8)	512 (4.7)	10.2 (0.14)
Florida, US r	4 (1.9)	595 (39.1)	33 (6.5)	530 (14.9)	63 (6.7)	484 (8.4)	9.4 (0.30)
Norway (8)	2 (1.0)	~ ~	51 (3.7)	494 (3.2)	47 (3.6)	479 (2.6)	10.0 (0.10)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How would you characterize each of the following within your school?

	Very high	High	Medium	Low	Very low
1) Teachers' understanding of the school's curricular goals	○	○	○	○	○
2) Teachers' degree of success in implementing the school's curriculum	○	○	○	○	○
3) Teachers' expectations for student achievement	○	○	○	○	○
4) Teachers working together to improve student achievement	○	○	○	○	○
5) Teachers' ability to inspire students	○	○	○	○	○
6) Parental involvement in school activities	○	○	○	○	○
7) Parental commitment to ensure that students are ready to learn	○	○	○	○	○
8) Parental expectations for student achievement	○	○	○	○	○
9) Parental support for student achievement	○	○	○	○	○
10) Parental pressure for the school to maintain high academic standards	○	○	○	○	○
11) Students' desire to do well in school	○	○	○	○	○
12) Students' ability to reach school's academic goals	○	○	○	○	○
13) Students' respect for classmates who excel in school	○	○	○	○	○
14) Collaboration between school leadership and teachers to plan instruction	○	○	○	○	○

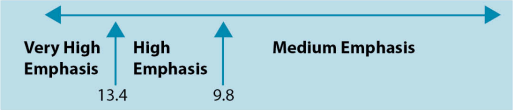

Exhibit 6.6: Teacher Job Satisfaction

Reported by Teachers

Students were scored according to how often their teachers responded positively to the seven statements on the *Teacher Job Satisfaction* scale. Students with **Very Satisfied** teachers had a score on the scale of at least 10.1, which corresponds to their teachers responding "very often" to four of the seven statements and responding "often" to the other three, on average. Students with **Less than Satisfied** teachers had a score no higher than 6.6, which corresponds to their teachers responding "sometimes" to four of the seven statements and "often" to the other three, on average. All other students had **Satisfied** teachers.

Country	Very Satisfied		Satisfied		Less than Satisfied		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Iran, Islamic Rep. of	83 (2.3)	430 (3.6)	16 (2.3)	439 (10.4)	1 (0.3)	~ ~	11.3 (0.10)
Qatar	75 (3.2)	438 (4.2)	22 (3.1)	442 (9.1)	3 (1.5)	460 (23.3)	11.0 (0.13)
Oman	74 (3.0)	428 (3.1)	24 (2.9)	422 (5.3)	2 (0.7)	~ ~	10.8 (0.11)
United Arab Emirates	70 (1.8)	461 (3.4)	27 (1.8)	437 (5.7)	3 (0.7)	405 (14.9)	10.7 (0.07)
Georgia	69 (3.5)	464 (4.4)	31 (3.4)	462 (7.9)	1 (0.5)	~ ~	10.7 (0.13)
Serbia	66 (3.7)	520 (4.6)	31 (3.8)	514 (5.3)	3 (1.3)	508 (11.3)	10.6 (0.14)
Chile	65 (4.3)	468 (3.4)	33 (4.2)	447 (5.2)	2 (1.3)	~ ~	10.7 (0.16)
Kazakhstan	64 (3.7)	548 (5.6)	36 (3.7)	540 (8.2)	0 (0.0)	~ ~	10.8 (0.13)
Spain	64 (3.4)	511 (2.7)	31 (3.3)	496 (4.2)	4 (1.9)	493 (10.7)	10.5 (0.15)
Indonesia	64 (3.1)	396 (4.8)	35 (3.0)	402 (6.1)	1 (0.9)	~ ~	10.5 (0.11)
Croatia	64 (3.4)	503 (2.2)	35 (3.3)	501 (3.5)	1 (0.8)	~ ~	10.6 (0.13)
South Africa (5)	62 (3.4)	375 (5.4)	32 (3.3)	382 (10.5)	7 (1.5)	353 (14.9)	10.3 (0.15)
Ireland	62 (4.1)	548 (3.2)	33 (4.0)	547 (4.0)	5 (1.9)	545 (11.0)	10.3 (0.18)
Saudi Arabia	61 (3.6)	391 (4.4)	32 (3.7)	380 (8.5)	7 (1.4)	342 (18.8)	10.3 (0.14)
Kuwait	59 (4.0)	355 (5.6)	33 (3.2)	345 (6.5)	8 (2.0)	361 (17.3)	10.2 (0.18)
Northern Ireland r	59 (5.0)	574 (4.3)	37 (4.7)	572 (6.4)	4 (2.0)	563 (23.8)	10.3 (0.21)
Cyprus	58 (3.4)	527 (3.1)	37 (3.5)	516 (4.3)	5 (1.4)	534 (7.0)	10.2 (0.13)
Bahrain	58 (2.1)	460 (2.3)	35 (2.0)	444 (3.7)	7 (0.6)	439 (4.8)	10.2 (0.10)
Turkey	56 (3.4)	492 (4.2)	41 (3.6)	472 (6.2)	3 (0.9)	471 (18.6)	10.3 (0.10)
Korea, Rep. of	55 (3.9)	613 (3.4)	38 (3.9)	602 (3.5)	7 (1.9)	602 (4.8)	10.1 (0.17)
Morocco	55 (3.3)	385 (4.4)	38 (3.1)	368 (6.4)	7 (1.2)	353 (11.9)	10.0 (0.13)
Canada	55 (2.5)	509 (3.3)	41 (2.3)	512 (3.5)	5 (1.0)	520 (7.0)	10.2 (0.09)
Netherlands r	53 (4.6)	529 (2.4)	40 (4.8)	530 (2.8)	7 (2.4)	535 (6.1)	9.9 (0.17)
Slovenia	52 (3.9)	520 (2.4)	47 (3.9)	521 (2.9)	0 (0.2)	~ ~	10.1 (0.13)
Australia	52 (3.9)	522 (4.1)	45 (3.9)	514 (5.8)	3 (1.0)	507 (9.5)	10.2 (0.14)
Portugal	51 (3.0)	548 (3.4)	45 (3.0)	536 (3.6)	4 (1.3)	519 (11.9)	10.1 (0.11)
Lithuania	50 (4.0)	537 (4.4)	46 (3.9)	532 (4.4)	4 (1.8)	558 (17.8)	9.9 (0.16)
New Zealand	50 (2.8)	494 (3.8)	43 (2.8)	487 (3.7)	7 (1.7)	482 (8.5)	9.8 (0.11)
Jordan	49 (4.1)	399 (5.6)	39 (4.1)	379 (6.2)	12 (2.6)	378 (13.5)	9.6 (0.19)
Bulgaria	48 (3.8)	526 (7.8)	44 (4.0)	526 (5.8)	8 (2.4)	506 (15.4)	9.8 (0.15)
Belgium (Flemish)	48 (3.5)	545 (3.6)	47 (3.7)	547 (2.7)	4 (1.5)	537 (12.1)	9.9 (0.14)
Russian Federation	48 (3.6)	560 (4.2)	51 (3.5)	567 (5.8)	1 (0.8)	~ ~	9.9 (0.12)
United States	47 (2.7)	542 (3.5)	45 (2.7)	538 (3.5)	7 (1.3)	521 (8.0)	9.9 (0.12)
Norway (5)	47 (3.7)	553 (2.6)	49 (4.0)	548 (4.4)	4 (1.9)	534 (6.1)	9.8 (0.15)
Chinese Taipei	46 (3.8)	597 (2.7)	48 (4.0)	596 (3.1)	6 (2.0)	600 (6.3)	9.7 (0.16)
Finland	45 (3.4)	535 (2.7)	50 (3.4)	535 (2.6)	6 (1.6)	530 (8.1)	9.8 (0.14)
Slovak Republic	44 (3.1)	502 (4.1)	46 (3.4)	497 (3.7)	10 (2.1)	485 (10.3)	9.7 (0.14)
Hungary	42 (3.6)	531 (5.7)	54 (3.5)	531 (4.1)	4 (1.2)	464 (27.6)	9.6 (0.14)
England	42 (4.2)	550 (6.2)	46 (4.0)	547 (5.7)	12 (2.8)	532 (9.2)	9.5 (0.20)
Italy	41 (3.5)	502 (4.3)	48 (3.4)	512 (3.8)	10 (2.1)	503 (6.3)	9.5 (0.14)
Germany	41 (3.6)	522 (3.1)	55 (3.8)	522 (3.1)	4 (1.4)	498 (17.3)	9.8 (0.14)
Singapore	37 (2.7)	625 (6.3)	53 (2.8)	612 (5.3)	11 (1.7)	620 (8.9)	9.3 (0.13)
Czech Republic	36 (3.5)	530 (3.5)	51 (3.4)	528 (3.0)	13 (2.2)	523 (7.6)	9.2 (0.15)
Sweden	36 (4.5)	524 (4.0)	61 (4.5)	517 (4.1)	4 (1.4)	499 (14.2)	9.5 (0.17)
Poland	35 (3.5)	538 (3.7)	55 (3.9)	532 (3.3)	11 (2.5)	538 (6.6)	9.1 (0.15)
Denmark	34 (3.8)	537 (4.6)	54 (4.1)	535 (4.1)	12 (3.0)	553 (10.0)	9.1 (0.17)
Hong Kong SAR	33 (4.3)	620 (5.9)	59 (4.8)	613 (3.7)	9 (2.5)	605 (16.0)	9.0 (0.19)
France	30 (3.5)	492 (5.3)	58 (3.7)	491 (3.5)	12 (2.5)	470 (7.1)	8.9 (0.14)
Japan	23 (3.0)	593 (3.8)	59 (3.2)	594 (2.4)	18 (2.8)	588 (3.2)	8.6 (0.15)
International Avg.	52 (0.5)	508 (0.6)	42 (0.5)	503 (0.8)	6 (0.2)	501 (2.0)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates that data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 6.6: Teacher Job Satisfaction (Continued)

Country	Very Satisfied		Satisfied		Less than Satisfied		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Abu Dhabi, UAE	67 (3.7)	432 (7.0)	29 (3.7)	396 (10.3)	4 (1.4)	352 (14.9)	10.5 (0.14)
Dubai, UAE	67 (2.1)	518 (2.7)	29 (2.2)	500 (5.9)	4 (1.0)	467 (25.7)	10.6 (0.07)
Ontario, Canada	55 (3.3)	512 (3.0)	39 (3.0)	514 (3.9)	7 (1.7)	523 (8.2)	10.1 (0.13)
Florida, US r	52 (6.1)	558 (6.1)	37 (5.1)	541 (8.8)	11 (3.4)	515 (15.8)	9.8 (0.27)
Quebec, Canada	49 (4.9)	538 (5.5)	47 (4.8)	533 (5.6)	3 (1.8)	539 (13.1)	10.1 (0.20)
Norway (4)	46 (3.8)	498 (3.1)	47 (3.7)	493 (3.9)	6 (2.0)	489 (7.8)	9.7 (0.16)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x

How often do you feel the following way about being a teacher?

	Very often	Often	Sometimes	Never or almost never
1) I am content with my profession as a teacher	○	○	○	○
2) I am satisfied with being a teacher at this school	○	○	○	○
3) I find my work full of meaning and purpose	○	○	○	○
4) I am enthusiastic about my job	○	○	○	○
5) My work inspires me	○	○	○	○
6) I am proud of the work I do	○	○	○	○
7) I am going to continue teaching for as long as I can	○	○	○	○

Very Satisfied — 10.1 — Satisfied — 6.6 — Less than Satisfied

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 6.7: Teacher Job Satisfaction

Reported by Teachers

Students were scored according to how often their teachers responded positively to the seven statements on the *Teacher Job Satisfaction* scale. Students with **Very Satisfied** teachers had a score on the scale of at least 10.3, which corresponds to their teachers responding "very often" to four of the seven statements and responding "often" to the other three, on average. Students with **Less than Satisfied** teachers had a score no higher than 7.0, which corresponds to their teachers responding "sometimes" to four of the seven statements and "often" to the other three, on average. All other students had **Satisfied** teachers.

Country	Very Satisfied		Satisfied		Less than Satisfied		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Egypt	80 (3.4)	396 (4.5)	16 (3.0)	377 (10.4)	4 (1.4)	381 (24.1)	11.2 (0.13)
Qatar	74 (3.3)	437 (4.1)	23 (3.5)	428 (8.3)	3 (1.1)	518 (37.6)	11.2 (0.12)
Kuwait	69 (4.0)	393 (6.1)	29 (4.0)	392 (10.4)	1 (0.8)	~ ~	10.8 (0.13)
Chile	66 (4.1)	435 (4.8)	33 (4.0)	422 (6.3)	1 (0.8)	~ ~	10.7 (0.15)
Israel	66 (2.6)	514 (6.0)	31 (2.5)	505 (8.3)	3 (0.7)	493 (14.2)	10.8 (0.10)
Thailand	66 (3.5)	435 (5.9)	33 (3.4)	425 (7.2)	1 (0.9)	~ ~	10.7 (0.12)
United Arab Emirates	64 (2.6)	463 (3.6)	31 (2.5)	473 (6.0)	5 (1.0)	458 (13.2)	10.7 (0.10)
Lebanon	63 (4.2)	447 (4.8)	33 (4.2)	430 (7.2)	4 (1.6)	472 (19.2)	10.6 (0.13)
Georgia	62 (4.4)	458 (4.3)	37 (4.3)	447 (6.1)	2 (1.1)	~ ~	10.5 (0.15)
Bahrain	61 (3.3)	457 (2.8)	34 (3.5)	448 (4.8)	5 (1.7)	466 (15.7)	10.5 (0.12)
Oman	61 (3.3)	407 (3.7)	33 (3.2)	397 (4.9)	6 (1.7)	395 (8.1)	10.4 (0.12)
Kazakhstan	59 (4.1)	532 (6.7)	40 (4.1)	523 (8.4)	1 (0.4)	~ ~	10.6 (0.11)
Iran, Islamic Rep. of	58 (3.5)	437 (5.7)	36 (3.7)	440 (8.1)	6 (1.6)	409 (10.4)	10.4 (0.11)
Ireland	58 (2.9)	532 (4.1)	36 (2.5)	514 (5.0)	6 (1.4)	498 (12.8)	10.4 (0.12)
Canada	57 (2.8)	527 (2.5)	38 (2.7)	539 (3.3)	5 (1.1)	500 (13.2)	10.4 (0.10)
Saudi Arabia	56 (4.6)	370 (6.3)	41 (4.5)	363 (6.5)	3 (1.3)	365 (13.5)	10.4 (0.15)
Malaysia	56 (3.8)	465 (5.6)	43 (3.7)	468 (6.8)	1 (0.8)	~ ~	10.4 (0.13)
Jordan	50 (3.8)	389 (5.4)	42 (3.5)	386 (5.5)	8 (2.0)	364 (9.3)	10.0 (0.16)
Australia	50 (3.6)	514 (4.2)	39 (3.4)	504 (5.6)	11 (2.1)	496 (8.1)	9.9 (0.15)
South Africa (9)	48 (3.4)	380 (7.3)	43 (3.4)	363 (6.4)	9 (2.0)	373 (18.0)	9.9 (0.14)
Chinese Taipei	48 (4.0)	608 (4.4)	43 (4.0)	592 (4.7)	9 (2.3)	588 (12.3)	9.8 (0.16)
Norway (9)	47 (3.7)	512 (3.0)	47 (3.8)	512 (3.9)	6 (1.7)	514 (6.9)	10.1 (0.15)
Turkey	46 (3.7)	470 (6.4)	45 (3.9)	449 (7.2)	10 (1.6)	439 (10.8)	9.7 (0.12)
Malta	45 (0.1)	500 (1.5)	44 (0.1)	499 (1.7)	11 (0.1)	452 (3.1)	9.9 (0.01)
United States	44 (2.9)	520 (4.7)	42 (2.9)	516 (4.9)	14 (1.9)	518 (7.1)	9.8 (0.13)
New Zealand	43 (3.4)	494 (5.3)	47 (3.8)	497 (6.2)	10 (1.6)	472 (15.7)	9.7 (0.11)
Morocco	42 (3.4)	393 (3.3)	51 (3.3)	378 (3.0)	7 (1.6)	378 (7.6)	9.7 (0.13)
Slovenia	40 (2.9)	517 (3.2)	55 (2.8)	516 (3.1)	5 (1.3)	521 (8.3)	9.8 (0.10)
Russian Federation	39 (3.6)	548 (5.6)	55 (3.5)	535 (5.9)	6 (1.6)	502 (12.6)	9.7 (0.15)
Korea, Rep. of	38 (3.1)	604 (4.2)	53 (3.7)	606 (4.2)	10 (2.0)	609 (8.0)	9.5 (0.15)
Botswana (9)	36 (4.1)	395 (4.4)	51 (4.5)	388 (3.2)	13 (2.9)	394 (5.9)	9.3 (0.15)
Italy	34 (4.0)	501 (4.4)	56 (4.1)	487 (3.7)	10 (2.5)	502 (6.4)	9.4 (0.16)
Lithuania	33 (4.0)	522 (6.7)	53 (4.1)	503 (3.7)	13 (3.2)	511 (8.6)	9.3 (0.17)
Sweden	32 (4.1)	497 (5.2)	56 (4.1)	502 (4.0)	11 (3.5)	501 (6.4)	9.3 (0.19)
Hungary	31 (3.4)	528 (6.1)	59 (3.6)	510 (5.5)	10 (2.2)	497 (11.2)	9.3 (0.14)
Hong Kong SAR	31 (4.0)	612 (8.6)	60 (3.8)	587 (6.7)	10 (2.1)	562 (17.2)	9.4 (0.16)
Singapore	31 (2.4)	631 (7.6)	56 (2.8)	616 (4.7)	14 (1.9)	612 (11.1)	9.2 (0.11)
England	29 (4.0)	523 (9.2)	57 (4.5)	517 (7.4)	14 (2.7)	505 (14.2)	9.1 (0.15)
Japan	26 (3.4)	583 (4.6)	58 (3.7)	588 (3.3)	16 (2.9)	585 (6.2)	9.0 (0.16)
International Avg.	50 (0.6)	486 (0.8)	43 (0.6)	478 (1.0)	7 (0.3)	480 (2.4)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 6.7: Teacher Job Satisfaction (Continued)

Country	Very Satisfied		Satisfied		Less than Satisfied		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Abu Dhabi, UAE	63 (4.7)	440 (8.8)	30 (4.4)	451 (12.9)	7 (2.3)	426 (16.3)	10.5 (0.18)
Ontario, Canada	62 (4.4)	524 (3.3)	32 (4.1)	530 (4.6)	6 (1.5)	494 (16.6)	10.4 (0.16)
Dubai, UAE	61 (2.3)	512 (3.7)	35 (2.4)	516 (4.9)	4 (0.9)	517 (27.7)	10.6 (0.08)
Norway (8)	49 (4.2)	489 (3.1)	47 (4.2)	487 (2.6)	4 (1.2)	466 (14.1)	10.0 (0.15)
Quebec, Canada	47 (4.8)	543 (3.6)	50 (4.7)	556 (5.0)	3 (1.7)	524 (26.5)	10.3 (0.18)
Florida, US r	35 (6.4)	506 (14.3)	51 (7.2)	506 (11.3)	14 (4.3)	474 (21.8)	9.3 (0.24)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x

How often do you feel the following way about being a teacher?

	Very often	Often	Sometimes	Never or almost never
1) I am content with my profession as a teacher	○	○	○	○
2) I am satisfied with being a teacher at this school	○	○	○	○
3) I find my work full of meaning and purpose	○	○	○	○
4) I am enthusiastic about my job	○	○	○	○
5) My work inspires me	○	○	○	○
6) I am proud of the work I do	○	○	○	○
7) I am going to continue teaching for as long as I can	○	○	○	○

Very Satisfied — 10.3 — Satisfied — 7.0 — Less than Satisfied

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 6.8: Challenges Facing Teachers

Reported by Teachers

Students were scored according to their teachers' responses concerning eight challenging conditions on the *Challenges Facing Teachers* scale. Students whose teachers faced **Few Challenges** had a score on the scale of at least 10.4, which corresponds to their teachers "disagreeing a little" with four of eight statements and "agreeing a little" with the other four, on average. Students whose teachers faced **Many Challenges** had a score no higher than 7.1, which corresponds to their teachers reporting "agreeing a lot" with four of eight statements and "agreeing a little" with the other four, on average. All other students had teachers that reported facing **Some Challenges**.

Country	Few Challenges		Some Challenges		Many Challenges		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Georgia	85 (3.3)	467 (3.9)	15 (3.3)	446 (11.1)	0 (0.0)	~ ~	11.9 (0.11)
Poland	78 (3.1)	535 (2.5)	21 (2.9)	535 (4.3)	1 (1.0)	~ ~	11.4 (0.13)
Russian Federation	77 (2.6)	567 (4.2)	23 (2.6)	553 (5.9)	0 (0.0)	~ ~	11.2 (0.10)
Finland	71 (3.0)	534 (2.4)	29 (3.0)	538 (3.3)	0 (0.0)	~ ~	11.0 (0.09)
Turkey	68 (3.2)	483 (4.2)	29 (2.9)	485 (7.4)	2 (1.3)	~ ~	11.4 (0.14)
Kazakhstan	65 (3.9)	547 (6.0)	34 (3.9)	542 (7.6)	1 (0.4)	~ ~	10.8 (0.09)
Lithuania	65 (4.0)	532 (3.7)	34 (3.9)	544 (4.7)	1 (0.9)	~ ~	10.9 (0.12)
Qatar	63 (3.2)	448 (4.6)	36 (3.3)	423 (6.1)	1 (0.7)	~ ~	11.0 (0.13)
Bulgaria	60 (4.4)	524 (5.8)	37 (4.4)	523 (8.1)	3 (1.6)	539 (13.8)	10.6 (0.14)
Italy	53 (3.5)	506 (3.9)	44 (3.7)	508 (4.0)	3 (1.0)	510 (13.2)	10.6 (0.13)
Slovak Republic	51 (3.2)	499 (3.1)	44 (2.9)	497 (4.4)	5 (1.2)	494 (10.3)	10.4 (0.13)
Czech Republic	50 (3.5)	527 (3.2)	48 (3.5)	529 (3.0)	2 (0.8)	~ ~	10.5 (0.12)
United Arab Emirates	50 (2.4)	464 (3.9)	44 (2.6)	442 (4.5)	6 (0.8)	433 (13.9)	10.7 (0.11)
Indonesia	47 (3.0)	401 (5.6)	48 (3.2)	397 (5.5)	5 (1.3)	365 (20.2)	10.2 (0.10)
Bahrain	46 (2.5)	453 (3.1)	49 (2.5)	454 (2.8)	5 (0.6)	448 (5.8)	10.3 (0.08)
Kuwait	46 (3.3)	363 (6.2)	46 (3.1)	344 (6.8)	8 (1.8)	329 (12.3)	10.1 (0.13)
Croatia	46 (3.4)	500 (2.9)	48 (3.5)	504 (2.8)	6 (1.8)	504 (10.1)	10.0 (0.11)
Morocco	45 (3.2)	385 (5.6)	45 (3.3)	372 (5.8)	10 (1.7)	361 (10.4)	10.0 (0.15)
Chinese Taipei	45 (3.9)	597 (2.6)	53 (4.0)	597 (2.5)	2 (1.1)	~ ~	10.2 (0.13)
Saudi Arabia	41 (3.6)	392 (7.1)	48 (3.8)	380 (6.0)	11 (2.4)	368 (12.2)	9.8 (0.13)
Belgium (Flemish)	40 (3.4)	539 (3.7)	56 (3.5)	550 (2.7)	4 (1.6)	565 (11.8)	10.0 (0.10)
Jordan	39 (3.3)	395 (6.6)	56 (3.5)	383 (4.6)	5 (1.6)	401 (10.2)	10.0 (0.14)
Japan	38 (3.0)	590 (2.7)	55 (3.2)	595 (2.9)	7 (1.7)	593 (5.9)	9.8 (0.10)
Iran, Islamic Rep. of	37 (3.4)	434 (6.6)	52 (3.9)	429 (5.2)	11 (2.2)	433 (10.4)	9.6 (0.14)
Germany	37 (2.9)	522 (3.5)	58 (3.1)	522 (3.0)	5 (1.7)	507 (13.2)	9.7 (0.11)
United States	36 (2.8)	535 (4.0)	54 (2.7)	539 (3.4)	10 (1.4)	549 (6.1)	9.7 (0.10)
Sweden	33 (4.3)	515 (4.9)	61 (4.6)	522 (3.5)	5 (1.9)	508 (14.6)	9.9 (0.14)
Serbia	33 (3.5)	511 (7.4)	59 (3.6)	523 (3.9)	8 (2.1)	511 (10.5)	9.7 (0.14)
Ireland	33 (3.7)	545 (4.0)	53 (4.3)	547 (3.3)	14 (3.1)	551 (4.9)	9.4 (0.15)
Oman	32 (2.9)	427 (4.7)	60 (2.6)	423 (3.5)	8 (1.8)	448 (10.6)	9.7 (0.11)
South Africa (5)	32 (3.1)	395 (9.0)	57 (2.9)	362 (5.7)	11 (2.1)	396 (14.3)	9.4 (0.14)
New Zealand	31 (2.3)	486 (6.2)	55 (2.7)	492 (2.6)	14 (1.9)	498 (5.9)	9.5 (0.11)
Canada	30 (2.6)	505 (4.3)	58 (2.7)	512 (3.3)	12 (1.4)	520 (4.6)	9.4 (0.09)
Cyprus	30 (3.1)	523 (4.1)	65 (3.1)	523 (3.0)	5 (1.5)	527 (11.0)	9.6 (0.11)
Hong Kong SAR	29 (4.0)	610 (6.1)	64 (4.4)	614 (4.2)	7 (2.5)	632 (13.4)	9.6 (0.17)
Hungary	29 (3.2)	523 (5.6)	56 (3.7)	529 (4.7)	15 (2.5)	539 (8.2)	9.3 (0.12)
Spain	28 (2.9)	506 (5.2)	61 (3.1)	505 (3.2)	11 (2.1)	504 (5.8)	9.3 (0.10)
Korea, Rep. of	27 (3.0)	612 (4.3)	58 (3.6)	604 (2.9)	15 (2.7)	615 (3.8)	9.3 (0.15)
Netherlands r	27 (3.6)	524 (3.6)	69 (3.7)	532 (2.0)	4 (1.7)	541 (7.2)	9.5 (0.13)
Northern Ireland r	25 (3.7)	581 (6.2)	57 (4.1)	568 (4.9)	18 (3.8)	576 (7.1)	9.1 (0.20)
England	25 (3.4)	555 (9.9)	57 (4.0)	543 (4.5)	19 (3.1)	544 (7.4)	9.2 (0.18)
Australia	24 (2.6)	522 (7.6)	67 (2.5)	515 (4.0)	8 (1.9)	529 (7.8)	9.4 (0.11)
Denmark	22 (3.0)	536 (6.6)	64 (3.7)	538 (4.0)	14 (2.7)	540 (6.4)	9.2 (0.14)
Norway (5)	22 (3.6)	550 (5.0)	69 (3.6)	551 (3.3)	9 (2.5)	541 (6.7)	9.4 (0.16)
Chile	19 (3.3)	467 (8.4)	62 (4.1)	460 (3.4)	18 (3.3)	454 (5.8)	8.9 (0.15)
Slovenia	17 (2.5)	518 (3.5)	74 (2.9)	522 (2.2)	9 (2.2)	517 (7.6)	9.1 (0.11)
Portugal	14 (2.8)	564 (9.6)	56 (4.0)	537 (3.7)	30 (3.3)	539 (3.8)	8.5 (0.16)
France	9 (2.1)	488 (8.2)	76 (2.9)	491 (2.9)	15 (3.0)	476 (6.1)	8.7 (0.12)
Singapore	- -	- -	- -	- -	- -	- -	- -
International Avg.	41 (0.5)	504 (0.8)	51 (0.5)	501 (0.7)	8 (0.3)	497 (1.6)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 6.8: Challenges Facing Teachers (Continued)

Country	Few Challenges		Some Challenges		Many Challenges		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	52 (3.8)	521 (3.3)	41 (3.8)	499 (5.4)	7 (0.4)	498 (6.3)	10.7 (0.19)
Abu Dhabi, UAE	49 (3.9)	437 (8.9)	45 (4.3)	406 (8.1)	6 (2.1)	371 (30.3)	10.4 (0.18)
Norway (4)	33 (3.6)	494 (4.1)	53 (4.0)	492 (3.9)	14 (3.2)	507 (4.9)	9.4 (0.16)
Ontario, Canada	32 (3.2)	508 (4.8)	58 (3.2)	515 (3.1)	10 (1.9)	524 (7.1)	9.6 (0.12)
Florida, US r	29 (5.2)	547 (9.6)	66 (5.6)	548 (5.4)	5 (2.3)	542 (31.4)	9.6 (0.24)
Quebec, Canada	26 (5.0)	529 (6.7)	58 (5.5)	539 (5.3)	16 (3.6)	533 (6.3)	9.1 (0.18)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x

Indicate the extent to which you agree or disagree with each of the following statements.

	Disagree a lot	Disagree a little	Agree a little	Agree a lot
1) There are too many students in the classes	○	○	○	○
2) I have too much material to cover in class	○	○	○	○
3) I have too many teaching hours	○	○	○	○
4) I need more time to prepare for class	○	○	○	○
5) I need more time to assist individual students	○	○	○	○
6) I feel too much pressure from parents	○	○	○	○
7) I have difficulty keeping up with all the changes to the curriculum	○	○	○	○
8) I have too many administrative tasks	○	○	○	○

Few Challenges — Some Challenges (10.4) — Many Challenges (7.1)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 6.9: Challenges Facing Teachers

Reported by Teachers

Students were scored according to their teachers' responses concerning eight challenging conditions on the *Challenges Facing Teachers* scale. Students whose teachers faced **Few Challenges** had a score on the scale of at least 10.3, which corresponds to their teachers "disagreeing a little" with four of eight statements and "agreeing a little" with the other four, on average. Students whose teachers faced **Many Challenges** had a score no higher than 6.7, which corresponds to their teachers reporting "agreeing a lot" with four of eight statements and "agreeing a little" with the other four, on average. All other students had teachers that reported facing **Some Challenges**.

Country	Few Challenges		Some Challenges		Many Challenges		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Georgia	84 (3.4)	454 (3.9)	16 (3.4)	452 (8.0)	1 (0.6)	~ ~	11.6 (0.15)
Russian Federation	73 (3.4)	541 (4.6)	27 (3.4)	530 (8.4)	0 (0.0)	~ ~	11.0 (0.11)
Lithuania	72 (4.0)	509 (3.9)	27 (4.0)	515 (5.8)	1 (0.6)	~ ~	11.0 (0.12)
Turkey	72 (3.5)	456 (5.8)	27 (3.4)	462 (9.0)	1 (0.6)	~ ~	11.4 (0.15)
Lebanon	67 (4.1)	445 (5.4)	32 (4.1)	435 (6.9)	1 (0.5)	~ ~	11.6 (0.22)
Kazakhstan	67 (3.7)	533 (5.5)	33 (3.7)	518 (9.8)	0 (0.4)	~ ~	10.7 (0.10)
Qatar	65 (3.9)	440 (5.3)	33 (3.7)	430 (7.0)	2 (0.8)	~ ~	10.8 (0.15)
Italy	60 (3.4)	490 (3.8)	40 (3.4)	499 (4.6)	0 (0.4)	~ ~	10.5 (0.12)
Chinese Taipei	59 (3.8)	599 (3.9)	39 (3.9)	599 (5.1)	2 (0.9)	~ ~	10.5 (0.13)
Kuwait	58 (4.0)	395 (7.6)	40 (3.9)	390 (7.7)	2 (1.2)	~ ~	10.4 (0.16)
Japan	56 (3.5)	587 (3.5)	40 (3.4)	584 (4.4)	4 (1.4)	602 (5.8)	10.2 (0.11)
United Arab Emirates	52 (2.7)	475 (4.3)	45 (2.7)	454 (4.7)	3 (0.8)	469 (13.4)	10.5 (0.13)
Morocco	48 (3.1)	388 (3.5)	50 (3.1)	381 (2.9)	1 (0.6)	~ ~	10.2 (0.10)
Jordan	48 (3.1)	389 (4.9)	46 (3.2)	381 (4.0)	7 (1.9)	391 (21.3)	10.0 (0.12)
Israel	47 (2.6)	507 (6.0)	48 (2.6)	516 (7.7)	5 (1.2)	490 (19.1)	10.1 (0.12)
Oman	46 (3.7)	401 (5.4)	50 (3.6)	406 (4.3)	4 (1.2)	400 (6.9)	10.2 (0.14)
Bahrain	46 (4.3)	459 (3.3)	52 (4.3)	449 (3.0)	3 (1.2)	489 (29.0)	10.2 (0.14)
United States	44 (3.0)	516 (4.8)	48 (2.8)	518 (5.0)	7 (1.4)	539 (10.9)	9.9 (0.15)
Saudi Arabia	44 (4.4)	372 (7.1)	52 (4.3)	365 (6.2)	4 (1.5)	340 (23.5)	10.0 (0.15)
Canada	44 (3.3)	533 (3.1)	49 (3.3)	527 (3.8)	7 (1.6)	535 (5.9)	9.8 (0.13)
New Zealand	42 (3.0)	484 (5.3)	50 (3.2)	504 (5.8)	8 (2.1)	471 (12.3)	9.7 (0.12)
Egypt	40 (3.7)	401 (5.9)	57 (3.7)	386 (5.8)	4 (1.2)	397 (16.1)	10.0 (0.12)
Sweden	38 (4.1)	495 (5.2)	59 (4.2)	504 (3.5)	3 (1.4)	507 (19.9)	9.7 (0.13)
Thailand	37 (3.8)	442 (8.6)	54 (4.0)	422 (6.3)	9 (2.5)	446 (17.2)	9.6 (0.14)
Ireland	36 (2.8)	522 (5.1)	53 (2.9)	521 (4.3)	11 (2.1)	537 (6.7)	9.4 (0.12)
Malaysia	35 (3.8)	465 (6.0)	64 (3.8)	468 (5.0)	2 (0.9)	~ ~	9.7 (0.09)
Iran, Islamic Rep. of	34 (2.8)	426 (5.7)	60 (3.2)	442 (6.5)	6 (1.8)	436 (19.0)	9.7 (0.12)
Slovenia	33 (2.8)	518 (4.4)	61 (2.8)	517 (2.4)	5 (1.2)	508 (7.8)	9.6 (0.09)
Hong Kong SAR	33 (3.7)	602 (8.1)	63 (3.7)	589 (6.1)	3 (1.5)	612 (8.7)	9.7 (0.12)
England	32 (4.1)	530 (10.5)	57 (4.3)	511 (7.4)	12 (2.7)	510 (14.4)	9.2 (0.17)
Norway (9)	31 (4.1)	511 (4.6)	60 (4.4)	513 (2.7)	9 (2.3)	516 (7.4)	9.4 (0.16)
Australia	29 (2.9)	514 (6.1)	58 (3.3)	505 (3.7)	13 (2.1)	508 (8.0)	9.2 (0.13)
Korea, Rep. of	29 (3.4)	602 (5.2)	57 (3.5)	608 (3.5)	15 (2.6)	606 (6.8)	9.0 (0.14)
Malta	28 (0.1)	478 (2.3)	59 (0.2)	499 (1.5)	13 (0.1)	509 (2.1)	9.1 (0.01)
South Africa (9)	28 (3.1)	419 (10.8)	60 (3.5)	358 (4.4)	12 (2.5)	338 (7.1)	9.1 (0.14)
Hungary	27 (3.3)	521 (10.5)	64 (3.5)	507 (5.0)	9 (2.1)	543 (13.8)	9.3 (0.15)
Chile	20 (3.6)	435 (9.2)	68 (4.4)	430 (4.7)	12 (2.8)	418 (13.3)	9.1 (0.16)
Botswana (9)	17 (3.5)	398 (6.0)	77 (3.3)	390 (2.7)	6 (2.3)	386 (14.1)	9.1 (0.13)
Singapore	- -	- -	- -	- -	- -	- -	- -
International Avg.	45 (0.6)	480 (1.0)	49 (0.6)	476 (0.9)	5 (0.3)	481 (2.8)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 6.9: Challenges Facing Teachers (Continued)

Country	Few Challenges		Some Challenges		Many Challenges		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	59 (3.6)	523 (3.2)	37 (3.5)	496 (4.4)	4 (1.5)	523 (19.6)	10.8 (0.14)
Abu Dhabi, UAE	51 (5.2)	446 (9.3)	46 (5.3)	438 (9.9)	3 (1.1)	424 (20.8)	10.3 (0.22)
Quebec, Canada	45 (5.2)	555 (4.5)	50 (4.9)	544 (5.6)	5 (1.4)	546 (9.4)	9.9 (0.15)
Ontario, Canada	42 (4.0)	525 (3.9)	49 (4.1)	522 (5.1)	9 (2.7)	532 (8.8)	9.6 (0.17)
Florida, US r	27 (5.4)	517 (16.3)	60 (5.2)	494 (10.8)	13 (4.3)	504 (21.1)	8.9 (0.21)
Norway (8)	27 (3.2)	484 (3.6)	64 (3.3)	488 (2.6)	9 (2.2)	492 (6.5)	9.3 (0.14)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Indicate the extent to which you agree or disagree with each of the following statements.

	Disagree a lot	Disagree a little	Agree a little	Agree a lot
1) There are too many students in the classes	○	○	○	○
2) I have too much material to cover in class	○	○	○	○
3) I have too many teaching hours	○	○	○	○
4) I need more time to prepare for class	○	○	○	○
5) I need more time to assist individual students	○	○	○	○
6) I feel too much pressure from parents	○	○	○	○
7) I have difficulty keeping up with all the changes to the curriculum	○	○	○	○
8) I have too many administrative tasks	○	○	○	○

Few Challenges — Some Challenges (10.3) — Many Challenges (6.7)

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Exhibit 6.10: Students' Sense of School Belonging

Reported by Students

Students were scored according to their agreement to seven statements about their *Sense of School Belonging*. Students with a **High Sense of School Belonging** had a score on the scale of at least 9.1, which corresponds to their "agreeing a lot" to four of the seven statements and "agreeing a little" to each of the other three statements, on average. Students with **Little Sense of School Belonging** had a score no higher than 6.8, which corresponds to their "disagreeing a little" to four of the seven statements and "agreeing a little" to each of the other three statements, on average. All other students had a **Sense of School Belonging**.

Country	High Sense of School Belonging		Sense of School Belonging		Little Sense of School Belonging		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Indonesia	92 (0.5)	403 (3.6)	7 (0.5)	369 (7.9)	1 (0.2)	~ ~	11.5 (0.04)
Portugal	88 (0.9)	543 (2.1)	11 (0.8)	529 (5.4)	1 (0.2)	~ ~	11.3 (0.05)
Morocco	86 (0.8)	386 (3.6)	12 (0.7)	352 (6.5)	2 (0.3)	~ ~	11.3 (0.05)
Bulgaria	82 (1.2)	528 (5.3)	16 (1.1)	519 (5.7)	2 (0.3)	~ ~	10.9 (0.06)
Turkey	81 (1.0)	493 (3.0)	18 (0.9)	446 (5.7)	1 (0.2)	~ ~	10.8 (0.05)
Kazakhstan	80 (1.3)	548 (4.6)	19 (1.3)	530 (5.5)	1 (0.1)	~ ~	10.9 (0.07)
Jordan	79 (1.3)	397 (3.3)	17 (1.2)	376 (5.3)	3 (0.3)	347 (10.4)	10.9 (0.08)
Oman	79 (0.9)	432 (2.8)	18 (0.7)	413 (3.7)	4 (0.3)	373 (7.8)	10.7 (0.05)
Spain	78 (1.1)	507 (2.4)	19 (0.9)	502 (3.4)	3 (0.3)	484 (7.9)	10.5 (0.06)
Norway (5)	75 (1.1)	553 (2.6)	22 (1.0)	538 (3.6)	2 (0.3)	~ ~	10.5 (0.05)
Ireland	73 (1.2)	553 (2.3)	23 (1.1)	537 (3.5)	4 (0.4)	519 (7.8)	10.2 (0.05)
Serbia	73 (1.2)	520 (4.0)	24 (1.1)	520 (4.2)	3 (0.3)	501 (8.8)	10.3 (0.06)
Iran, Islamic Rep. of	71 (1.2)	427 (3.7)	26 (1.1)	451 (4.4)	3 (0.3)	399 (15.2)	10.2 (0.07)
Northern Ireland	71 (1.3)	576 (3.3)	25 (1.1)	561 (5.0)	3 (0.5)	523 (10.4)	10.2 (0.06)
Lithuania	71 (1.1)	540 (2.7)	26 (1.0)	528 (3.3)	3 (0.3)	500 (10.6)	10.1 (0.05)
Kuwait	71 (1.1)	355 (4.6)	25 (1.0)	355 (6.9)	4 (0.4)	329 (10.7)	10.3 (0.06)
Saudi Arabia	71 (1.3)	396 (4.3)	23 (1.0)	369 (4.9)	6 (0.7)	349 (11.0)	10.4 (0.07)
England	71 (1.4)	551 (3.3)	25 (1.2)	538 (3.9)	4 (0.4)	505 (7.5)	10.2 (0.06)
Chile	70 (1.2)	466 (2.5)	24 (0.9)	447 (3.3)	6 (0.5)	430 (6.8)	10.2 (0.06)
Finland	68 (1.3)	539 (2.2)	28 (1.1)	531 (3.1)	3 (0.4)	509 (6.0)	10.0 (0.05)
Russian Federation	68 (1.3)	568 (3.6)	29 (1.2)	558 (4.4)	3 (0.3)	548 (9.3)	10.0 (0.06)
South Africa (5)	68 (1.2)	391 (3.4)	27 (0.9)	356 (5.0)	5 (0.4)	330 (8.0)	10.1 (0.07)
Netherlands	68 (1.4)	534 (1.8)	28 (1.2)	523 (2.5)	4 (0.4)	518 (6.9)	10.0 (0.06)
New Zealand	67 (1.0)	493 (2.6)	29 (0.9)	492 (3.4)	4 (0.3)	459 (8.3)	10.0 (0.05)
Bahrain	67 (0.8)	457 (1.8)	27 (0.8)	447 (2.7)	6 (0.4)	420 (4.8)	10.0 (0.04)
Hungary	66 (1.0)	535 (3.3)	31 (0.9)	523 (3.9)	4 (0.3)	492 (8.9)	9.9 (0.05)
Canada	66 (0.9)	516 (2.1)	30 (0.8)	507 (3.0)	5 (0.3)	488 (5.9)	10.0 (0.04)
Sweden	65 (1.2)	522 (2.8)	32 (1.1)	515 (3.8)	3 (0.3)	495 (8.3)	9.9 (0.06)
United States	64 (0.8)	548 (2.3)	29 (0.6)	532 (2.6)	7 (0.4)	506 (4.5)	9.9 (0.04)
Belgium (Flemish)	64 (1.2)	550 (2.2)	33 (1.1)	541 (2.8)	4 (0.3)	519 (4.4)	9.8 (0.06)
United Arab Emirates	64 (0.8)	464 (2.5)	31 (0.7)	436 (3.3)	6 (0.3)	415 (5.7)	9.9 (0.04)
Italy	63 (1.3)	510 (2.8)	33 (1.0)	507 (3.2)	5 (0.5)	477 (10.0)	9.7 (0.05)
Cyprus	62 (1.3)	527 (2.7)	30 (0.9)	525 (3.4)	8 (0.7)	511 (6.9)	9.8 (0.06)
Denmark	62 (1.3)	547 (3.0)	33 (1.1)	530 (3.0)	4 (0.4)	512 (8.6)	9.8 (0.06)
Australia	62 (1.2)	524 (3.7)	33 (1.0)	511 (3.2)	5 (0.4)	483 (7.3)	9.8 (0.05)
Slovak Republic	61 (1.3)	495 (3.0)	35 (1.1)	507 (2.7)	4 (0.4)	488 (7.0)	9.7 (0.05)
Qatar	60 (1.1)	451 (3.5)	30 (0.9)	431 (4.4)	9 (0.8)	409 (6.4)	9.7 (0.06)
Germany r	57 (1.3)	528 (2.4)	36 (1.1)	527 (2.7)	7 (0.6)	506 (4.9)	9.5 (0.06)
Croatia	57 (1.5)	505 (2.0)	40 (1.3)	498 (2.9)	3 (0.4)	502 (7.9)	9.5 (0.06)
Singapore	56 (0.8)	622 (3.9)	39 (0.7)	615 (4.2)	6 (0.4)	596 (6.7)	9.5 (0.03)
Slovenia	55 (1.5)	519 (2.2)	39 (1.1)	523 (2.7)	6 (0.6)	518 (5.3)	9.5 (0.06)
Georgia	55 (1.3)	473 (4.2)	43 (1.3)	462 (4.0)	1 (0.3)	~ ~	9.7 (0.06)
Korea, Rep. of	52 (1.3)	614 (2.5)	45 (1.2)	603 (2.4)	3 (0.4)	587 (9.1)	9.5 (0.06)
France	51 (1.3)	490 (3.0)	45 (1.2)	489 (3.8)	3 (0.3)	453 (7.2)	9.3 (0.05)
Czech Republic	50 (1.4)	526 (2.7)	45 (1.3)	533 (2.8)	5 (0.7)	509 (6.7)	9.2 (0.05)
Poland	47 (1.4)	533 (2.4)	46 (1.2)	539 (2.6)	7 (0.6)	523 (5.7)	9.1 (0.05)
Chinese Taipei	46 (1.1)	603 (2.2)	46 (0.9)	595 (2.2)	8 (0.5)	572 (5.2)	9.1 (0.04)
Hong Kong SAR	46 (1.6)	624 (3.6)	43 (1.2)	611 (3.0)	11 (0.9)	593 (3.8)	9.0 (0.07)
Japan	41 (1.2)	604 (2.4)	52 (1.0)	589 (2.1)	8 (0.6)	565 (4.8)	8.9 (0.05)
International Avg.	66 (0.2)	510 (0.4)	30 (0.1)	499 (0.6)	4 (0.1)	482 (1.2)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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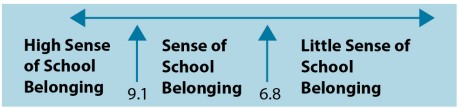
Exhibit 6.10: Students' Sense of School Belonging (Continued)

Country	High Sense of School Belonging		Sense of School Belonging		Little Sense of School Belonging		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Norway (4)	80 (1.4)	497 (2.1)	18 (1.3)	484 (5.0)	2 (0.4)	~ ~	10.7 (0.07)
Dubai, UAE	69 (0.8)	521 (1.9)	26 (0.8)	496 (2.7)	4 (0.3)	452 (5.5)	10.2 (0.03)
Florida, US	65 (1.5)	556 (5.4)	29 (1.2)	534 (5.3)	6 (0.7)	510 (8.1)	10.0 (0.08)
Ontario, Canada	64 (1.4)	518 (2.4)	30 (1.3)	505 (3.2)	6 (0.5)	492 (5.5)	9.9 (0.06)
Buenos Aires, Argentina	64 (1.1)	437 (3.1)	30 (0.8)	438 (3.7)	6 (0.5)	433 (5.5)	9.9 (0.05)
Quebec, Canada	63 (1.4)	539 (4.4)	33 (1.2)	533 (5.2)	4 (0.6)	518 (10.9)	9.8 (0.06)
Abu Dhabi, UAE	58 (1.8)	432 (5.5)	35 (1.4)	408 (6.4)	7 (0.6)	391 (8.1)	9.7 (0.08)

What do you think about your school? Tell how much you agree with these statements.

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) I like being in school	○	○	○	○
2) I feel safe when I am at school	○	○	○	○
3) I feel like I belong at this school	○	○	○	○
4) I like to see my classmates at school	○	○	○	○
5) Teachers at my school are fair to me	○	○	○	○
6) I am proud to go to this school	○	○	○	○
7) I learn a lot in school	○	○	○	○



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 6.11: Students' Sense of School Belonging

Reported by Students

Students were scored according to their agreement to seven statements about their *Sense of School Belonging*. Students with a **High Sense of School Belonging** had a score on the scale of at least 10.3, which corresponds to their "agreeing a lot" to four of the seven statements and "agreeing a little" to each of the other three statements, on average. Students with **Little Sense of School Belonging** had a score no higher than 7.5, which corresponds to their "disagreeing a little" to four of the seven statements and "agreeing a little" to each of the other three statements, on average. All other students had a **Sense of School Belonging**.

Country	High Sense of School Belonging		Sense of School Belonging		Little Sense of School Belonging		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Morocco	73 (0.9)	385 (2.1)	24 (0.8)	386 (3.5)	3 (0.3)	383 (6.6)	11.3 (0.05)
Jordan	66 (1.1)	388 (3.2)	28 (0.8)	389 (4.5)	6 (0.5)	381 (8.6)	11.0 (0.06)
Kazakhstan	66 (1.4)	533 (5.5)	33 (1.3)	519 (6.1)	1 (0.2)	~ ~	11.1 (0.06)
Egypt	63 (1.3)	400 (4.2)	30 (1.1)	386 (5.4)	7 (0.5)	388 (7.8)	10.9 (0.07)
Oman	62 (0.9)	412 (2.7)	33 (0.8)	395 (2.8)	5 (0.5)	381 (7.7)	10.8 (0.04)
South Africa (9)	60 (1.1)	376 (4.6)	36 (0.9)	371 (5.8)	4 (0.3)	378 (9.7)	10.7 (0.05)
Turkey	59 (1.1)	457 (4.9)	35 (0.9)	458 (5.4)	6 (0.4)	467 (8.8)	10.6 (0.05)
Thailand	58 (1.2)	433 (4.7)	40 (1.2)	432 (5.6)	2 (0.2)	~ ~	10.6 (0.05)
Kuwait	53 (1.5)	400 (5.4)	39 (1.2)	389 (6.0)	8 (0.6)	369 (8.2)	10.3 (0.07)
Botswana (9)	53 (0.8)	406 (2.3)	42 (0.8)	383 (2.9)	5 (0.4)	374 (7.3)	10.4 (0.03)
Lebanon	53 (1.3)	445 (3.8)	40 (1.2)	444 (3.8)	8 (0.5)	433 (5.8)	10.4 (0.06)
Norway (9)	52 (1.5)	521 (2.3)	41 (1.2)	506 (2.9)	7 (0.5)	475 (5.5)	10.4 (0.06)
Chile	50 (1.6)	435 (3.9)	39 (1.1)	425 (3.6)	11 (0.7)	406 (4.8)	10.2 (0.08)
Saudi Arabia	49 (1.5)	370 (5.2)	41 (1.2)	373 (5.2)	10 (0.8)	344 (7.4)	10.2 (0.06)
Israel	49 (1.4)	514 (4.6)	41 (1.0)	515 (4.3)	10 (0.7)	490 (6.5)	10.2 (0.07)
Malaysia	46 (1.3)	466 (4.2)	50 (1.1)	468 (3.8)	4 (0.5)	427 (7.6)	10.1 (0.05)
Iran, Islamic Rep. of	45 (1.3)	436 (5.8)	47 (1.1)	439 (4.4)	7 (0.5)	424 (6.7)	10.0 (0.05)
Canada	45 (1.1)	538 (2.0)	48 (0.9)	525 (2.3)	7 (0.5)	495 (4.3)	10.1 (0.05)
Georgia	44 (1.0)	463 (3.7)	51 (1.0)	448 (4.2)	5 (0.5)	443 (8.6)	10.1 (0.05)
New Zealand	43 (1.2)	509 (3.8)	49 (1.0)	488 (3.5)	8 (0.5)	449 (5.8)	10.0 (0.04)
Ireland	42 (1.3)	537 (2.7)	48 (1.0)	519 (3.1)	10 (0.7)	491 (5.9)	9.9 (0.06)
Bahrain	41 (0.8)	466 (2.7)	46 (0.9)	453 (2.1)	13 (1.0)	431 (4.4)	9.8 (0.05)
Australia	41 (1.1)	528 (3.4)	48 (0.9)	499 (2.8)	11 (0.5)	460 (5.0)	9.8 (0.05)
Qatar	39 (1.3)	458 (3.7)	46 (1.2)	436 (3.6)	15 (0.6)	398 (4.8)	9.7 (0.05)
Lithuania	38 (1.4)	512 (4.3)	54 (1.2)	513 (2.6)	8 (0.7)	498 (6.1)	9.8 (0.05)
United States	37 (0.9)	538 (3.9)	49 (0.7)	514 (2.9)	14 (0.6)	485 (3.6)	9.6 (0.05)
Singapore	37 (0.7)	638 (3.2)	55 (0.7)	615 (3.5)	9 (0.4)	589 (5.9)	9.8 (0.03)
Russian Federation	36 (1.2)	544 (5.9)	55 (1.1)	536 (4.6)	9 (0.6)	526 (6.2)	9.7 (0.05)
England	35 (1.3)	542 (4.4)	54 (1.0)	513 (4.4)	11 (0.6)	478 (5.5)	9.6 (0.05)
Sweden	35 (1.4)	515 (3.7)	56 (1.3)	498 (2.7)	9 (0.6)	468 (5.4)	9.7 (0.06)
Malta	33 (0.8)	520 (2.3)	51 (0.8)	492 (1.6)	16 (0.6)	452 (3.6)	9.5 (0.03)
Hong Kong SAR	31 (1.6)	616 (5.1)	55 (1.3)	591 (4.2)	14 (0.8)	560 (7.1)	9.4 (0.07)
Hungary	30 (1.2)	532 (5.6)	57 (1.0)	511 (4.1)	13 (0.7)	489 (5.4)	9.4 (0.06)
United Arab Emirates	29 (0.8)	504 (3.7)	44 (0.7)	461 (2.1)	27 (0.7)	431 (2.9)	9.1 (0.04)
Japan	27 (1.1)	599 (3.9)	60 (0.9)	586 (2.3)	13 (0.7)	565 (4.6)	9.4 (0.05)
Italy	27 (0.9)	500 (3.8)	61 (0.8)	495 (2.8)	12 (0.8)	479 (4.4)	9.3 (0.04)
Chinese Taipei	27 (0.9)	617 (3.4)	63 (0.7)	597 (2.4)	10 (0.5)	568 (6.0)	9.4 (0.04)
Korea, Rep. of	24 (0.9)	621 (3.9)	69 (0.8)	605 (2.6)	7 (0.5)	568 (6.2)	9.4 (0.04)
Slovenia	12 (0.7)	527 (4.7)	66 (0.9)	519 (2.3)	22 (1.0)	502 (2.9)	8.5 (0.04)
International Avg.	44 (0.2)	492 (0.7)	47 (0.2)	479 (0.6)	9 (0.1)	458 (1.0)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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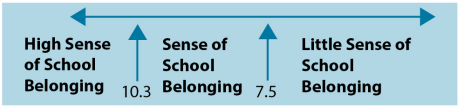
Exhibit 6.11: Students' Sense of School Belonging (Continued)

Country	High Sense of School Belonging		Sense of School Belonging		Little Sense of School Belonging		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Norway (8)	61 (1.4)	495 (2.0)	33 (1.2)	481 (2.8)	5 (0.5)	444 (5.7)	10.8 (0.06)
Buenos Aires, Argentina	52 (1.4)	404 (5.0)	40 (1.1)	390 (5.1)	8 (0.7)	375 (10.9)	10.3 (0.06)
Ontario, Canada	48 (1.6)	533 (2.6)	44 (1.3)	519 (2.9)	8 (0.8)	488 (5.3)	10.2 (0.07)
Dubai, UAE	44 (0.7)	534 (3.0)	43 (0.7)	507 (2.5)	13 (0.3)	457 (3.4)	10.0 (0.03)
Quebec, Canada	38 (1.4)	559 (3.3)	58 (1.3)	539 (4.2)	5 (0.4)	521 (6.4)	9.8 (0.05)
Florida, US	27 (2.0)	513 (8.5)	52 (1.3)	496 (6.1)	21 (1.6)	466 (7.0)	9.1 (0.09)
Abu Dhabi, UAE	21 (2.0)	484 (11.0)	42 (1.3)	441 (4.9)	36 (1.6)	420 (4.1)	8.7 (0.10)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

What do you think about your school? Tell how much you agree with these statements.

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) I like being in school	○	○	○	○
2) I feel safe when I am at school	○	○	○	○
3) I feel like I belong at this school	○	○	○	○
4) I like to see my classmates at school	○	○	○	○
5) Teachers at my school are fair to me	○	○	○	○
6) I am proud to go to this school	○	○	○	○
7) I learn a lot in school	○	○	○	○



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TIMSS 2015

CHAPTER 7: SCHOOL SAFETY

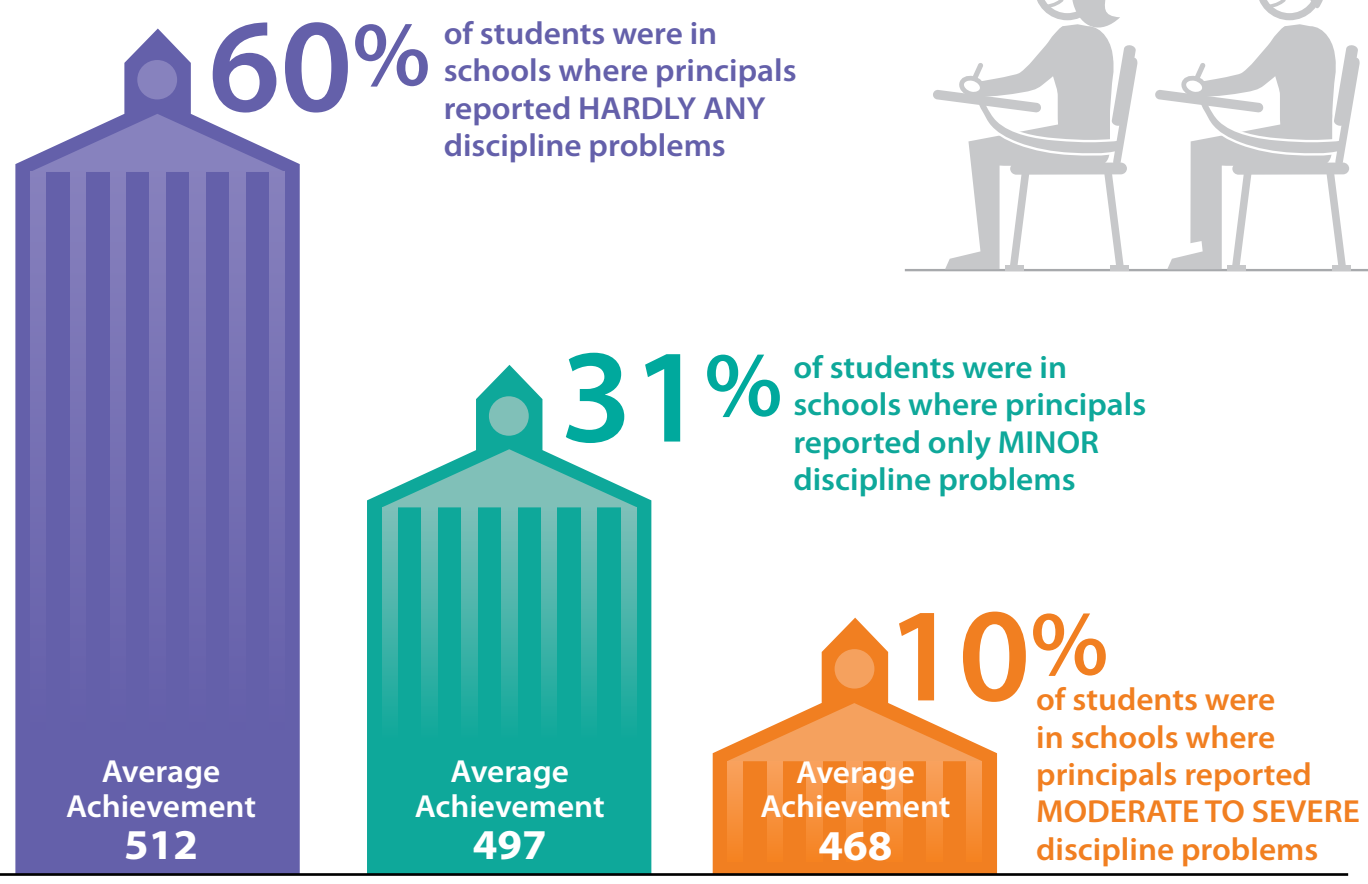
TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

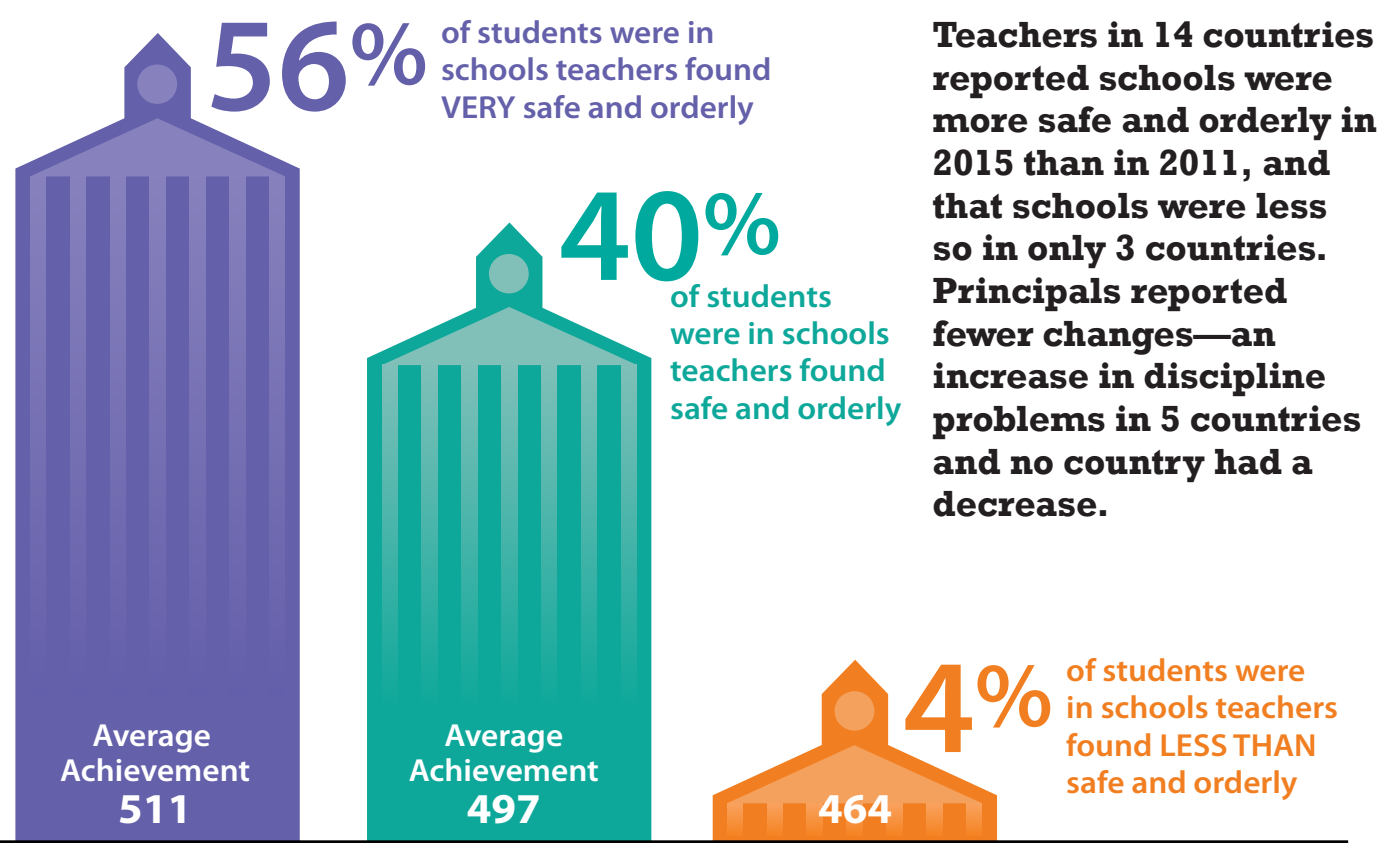
Students Are in Safe Schools

Internationally, the majority of fourth grade students were in safe school environments according to their principals and teachers. However, students that attended schools with disorderly environments had much lower achievement than their counterparts in safe and orderly schools.

Principals' Reports



Teachers' Reports

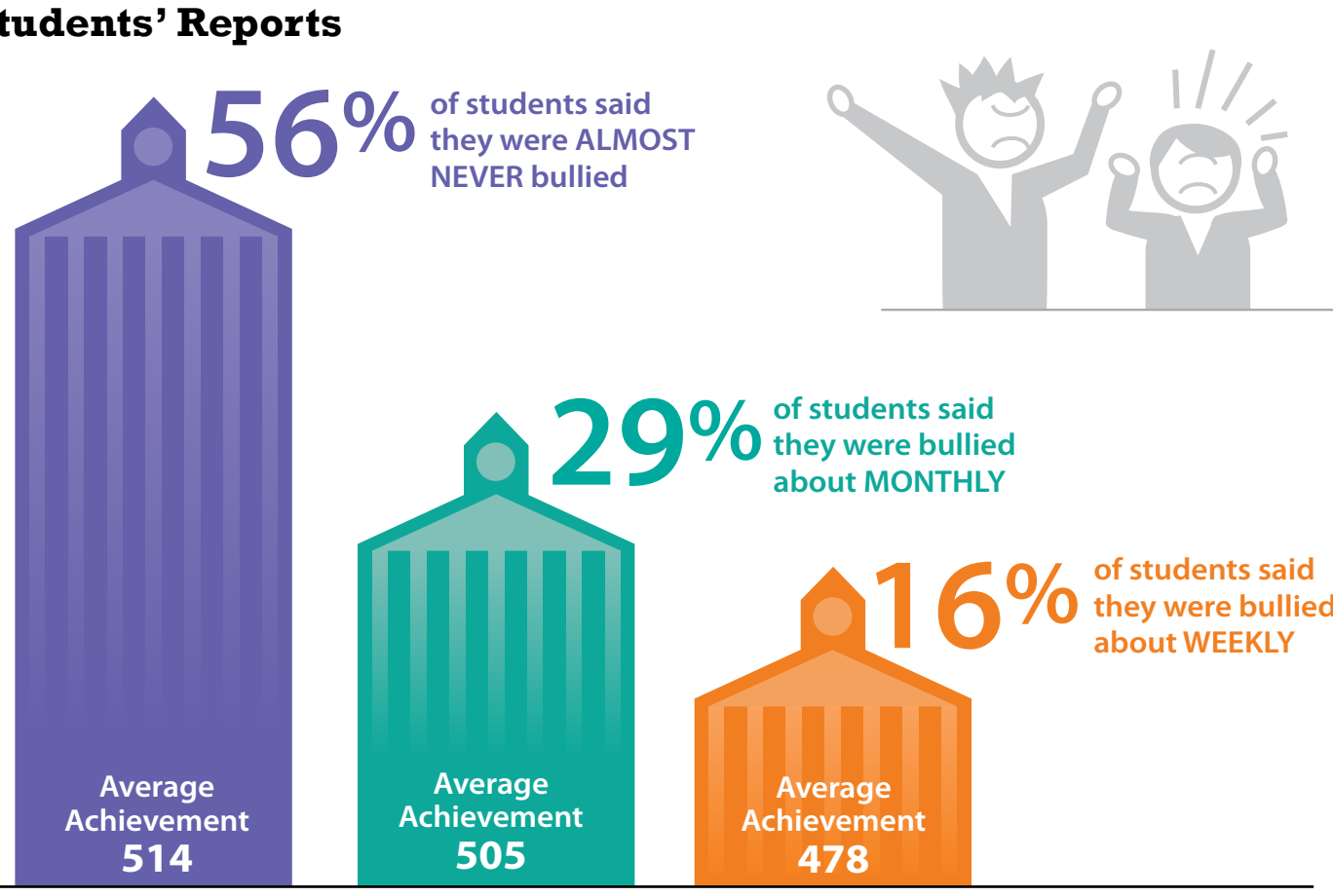


Teachers in 14 countries reported schools were more safe and orderly in 2015 than in 2011, and that schools were less so in only 3 countries. Principals reported fewer changes—an increase in discipline problems in 5 countries and no country had a decrease.

Student Bullying

With the emergence of cyber-bullying, there is growing evidence that school-related bullying is on the rise and does have a negative impact on student achievement.

Students' Reports



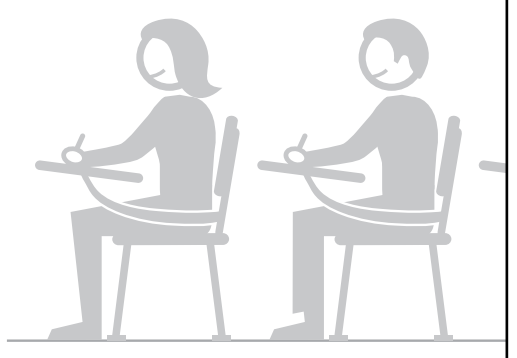
SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Students Are in Safe Schools

Internationally, the majority of eighth grade students were in safe school environments according to their principals and teachers. However, students that attended schools with disorderly environments had much lower achievement than their counterparts in safe and orderly schools.

Principals' Reports



43% of students were in schools where principals reported HARDLY ANY discipline problems

Average Achievement 495

45% of students were in schools where principals reported only MINOR discipline problems

Average Achievement 473

11% of students were in schools where principals reported MODERATE TO SEVERE discipline problems

Average Achievement 439

Teachers' Reports

46% of students were in schools teachers found VERY safe and orderly

Average Achievement 493

46% of students were in schools teachers found safe and orderly

Average Achievement 474

Teachers in 9 countries reported schools were more safe and orderly in 2015 than in 2011, and that schools were less so in only 1 country. Principals reported a decrease in discipline problems in 9 countries, and an increase in only 2.

8% of students were in schools teachers found LESS THAN safe and orderly

453

Student Bullying

With the emergence of cyber-bullying, there is growing evidence that school-related bullying is on the rise and does have a negative impact on student achievement.

Students' Reports

63% of students said they were ALMOST NEVER bullied

Average Achievement 488

29% of students said they were bullied about MONTHLY

Average Achievement 478

8% of students said they were bullied about WEEKLY

434

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

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Exhibit 7.1: School Discipline Problems – Principals' Reports

Reported by Principals

Students were scored according to their principals' responses concerning ten potential school problems on the *School Discipline Problems* scale. Students in schools with **Hardly Any Problems** had a score on the scale of at least 9.7, which corresponds to their principals reporting "not a problem" for five of the ten issues and "minor problem" for the other five, on average. Students in schools with **Moderate to Severe Problems** had a score no higher than 7.6, which corresponds to their principals reporting "moderate problem" for five of the ten issues and "minor problem" for the other five, on average. All other students attended schools with **Minor Problems**.

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Ireland	84 (3.3)	552 (2.6)	14 (3.1)	531 (7.3)	2 (1.2)	~ ~	10.9 (0.11)	-0.2 (0.17)
Netherlands s	83 (4.1)	536 (2.2)	17 (4.1)	529 (3.8)	0 (0.0)	~ ~	11.1 (0.13)	s -0.2 (0.20)
Korea, Rep. of	81 (3.4)	608 (2.5)	14 (3.0)	613 (5.1)	5 (1.8)	591 (9.4)	11.3 (0.16)	0.4 (0.22)
Lithuania	79 (3.4)	536 (2.7)	20 (3.4)	532 (9.4)	1 (1.0)	~ ~	10.6 (0.10)	0.1 (0.16)
England	78 (3.7)	553 (3.6)	21 (3.6)	524 (6.7)	1 (0.8)	~ ~	10.9 (0.11)	0.3 (0.16)
Northern Ireland r	78 (4.0)	575 (3.6)	22 (4.0)	552 (8.8)	0 (0.0)	~ ~	10.8 (0.13)	r -0.2 (0.19)
Croatia	76 (4.1)	503 (2.1)	24 (4.1)	501 (4.5)	0 (0.0)	~ ~	10.7 (0.14)	0.3 (0.18)
Japan	74 (3.2)	595 (2.1)	20 (3.0)	589 (4.2)	6 (2.0)	589 (7.8)	10.4 (0.14)	-0.1 (0.18)
Norway (5)	74 (4.3)	553 (3.0)	25 (4.2)	537 (4.9)	1 (0.8)	~ ~	10.7 (0.13)	◊ ◊
Bulgaria	72 (4.2)	535 (4.6)	20 (3.8)	491 (10.0)	8 (2.9)	514 (33.2)	10.4 (0.18)	◊ ◊
Singapore	72 (0.0)	620 (4.9)	28 (0.0)	615 (8.0)	0 (0.0)	~ ~	10.7 (0.00)	0.0 (0.00)
Kazakhstan	71 (3.9)	544 (5.5)	13 (2.7)	559 (14.8)	15 (2.8)	536 (9.7)	10.3 (0.21)	-0.9 (0.24) ▼
New Zealand	71 (2.8)	506 (3.2)	28 (2.9)	462 (6.4)	1 (0.8)	~ ~	10.5 (0.08)	-0.1 (0.15)
Hong Kong SAR	71 (4.6)	617 (4.0)	29 (4.6)	610 (7.7)	0 (0.0)	~ ~	10.5 (0.13)	-0.8 (0.17) ▼
Georgia	70 (3.9)	468 (4.3)	22 (3.5)	441 (7.7)	8 (2.6)	491 (24.2)	10.4 (0.19)	-0.3 (0.24)
Spain	70 (3.4)	512 (2.9)	22 (3.0)	489 (5.8)	8 (1.5)	489 (9.3)	10.3 (0.13)	-0.5 (0.21)
Chinese Taipei	70 (4.1)	600 (2.2)	28 (3.8)	591 (4.2)	3 (1.6)	573 (16.4)	10.6 (0.14)	-0.7 (0.20) ▼
United States	69 (3.3)	549 (3.3)	29 (3.3)	521 (5.0)	3 (0.9)	475 (10.2)	10.3 (0.10)	0.0 (0.14)
Finland	68 (3.8)	538 (2.5)	31 (3.7)	529 (3.0)	1 (1.0)	~ ~	10.3 (0.11)	0.1 (0.16)
Belgium (Flemish)	68 (3.6)	553 (2.3)	31 (3.8)	535 (5.7)	1 (1.1)	~ ~	10.5 (0.12)	0.1 (0.18)
Russian Federation	67 (3.9)	566 (4.6)	32 (3.9)	560 (6.4)	0 (0.4)	~ ~	10.2 (0.09)	0.0 (0.13)
Canada	66 (3.1)	518 (2.6)	31 (2.9)	497 (4.6)	2 (1.0)	~ ~	10.2 (0.10)	◊ ◊
Czech Republic	65 (3.6)	529 (2.9)	31 (3.5)	528 (4.3)	4 (1.8)	506 (18.7)	10.1 (0.10)	0.0 (0.15)
Iran, Islamic Rep. of	65 (3.5)	436 (5.0)	26 (3.3)	438 (6.3)	9 (2.4)	383 (17.6)	10.0 (0.13)	-0.7 (0.17) ▼
Australia	64 (3.4)	530 (3.5)	30 (3.4)	506 (5.4)	6 (3.1)	446 (5.9)	10.2 (0.12)	-0.2 (0.17)
Qatar	63 (3.0)	444 (5.0)	26 (2.8)	428 (8.1)	11 (1.8)	434 (9.7)	10.0 (0.12)	0.0 (0.19)
Slovak Republic	63 (3.6)	510 (3.2)	32 (3.4)	484 (5.1)	5 (1.7)	444 (18.9)	10.0 (0.10)	0.1 (0.16)
United Arab Emirates	61 (2.4)	467 (3.5)	31 (2.5)	426 (4.9)	8 (1.2)	396 (9.6)	10.1 (0.07)	0.2 (0.13)
Italy	60 (4.5)	508 (3.7)	25 (3.7)	504 (5.4)	15 (3.0)	509 (7.9)	9.6 (0.16)	0.1 (0.22)
Bahrain	59 (0.2)	456 (1.8)	26 (0.2)	446 (2.6)	14 (0.1)	427 (7.3)	9.7 (0.01)	-0.4 (0.31)
France	58 (4.6)	497 (4.1)	33 (4.3)	480 (4.5)	9 (2.7)	454 (12.1)	9.9 (0.15)	◊ ◊
Serbia	56 (4.3)	519 (5.0)	35 (3.8)	521 (4.8)	9 (2.0)	499 (13.2)	9.8 (0.15)	0.1 (0.23)
Hungary	55 (3.7)	541 (4.5)	37 (3.6)	524 (5.3)	8 (1.7)	471 (20.7)	9.8 (0.11)	0.1 (0.17)
Denmark r	53 (4.3)	548 (3.8)	45 (4.4)	533 (4.5)	1 (1.0)	~ ~	9.9 (0.11)	r -0.2 (0.14)
Slovenia	52 (4.3)	521 (2.5)	45 (4.5)	520 (3.2)	3 (1.3)	540 (5.2)	9.8 (0.13)	-0.2 (0.18)
Poland	52 (3.6)	534 (2.7)	45 (3.8)	537 (3.6)	3 (1.4)	528 (16.0)	9.8 (0.09)	◊ ◊
Cyprus	50 (4.8)	530 (3.6)	42 (4.5)	517 (4.6)	8 (2.6)	514 (6.7)	9.7 (0.17)	◊ ◊
Sweden	49 (4.1)	531 (3.5)	40 (4.0)	514 (3.6)	10 (2.6)	481 (13.8)	9.4 (0.11)	-0.3 (0.17)
Saudi Arabia	49 (3.9)	388 (5.2)	26 (3.1)	377 (9.1)	25 (3.4)	382 (10.4)	9.2 (0.19)	0.1 (0.26)
Chile	46 (4.0)	470 (4.1)	47 (4.3)	452 (5.5)	6 (2.2)	437 (15.5)	9.6 (0.11)	0.4 (0.18)
Turkey	44 (3.5)	506 (4.8)	29 (3.2)	464 (7.9)	26 (2.9)	465 (7.5)	8.8 (0.15)	-0.2 (0.21)
Portugal	43 (4.5)	546 (3.6)	46 (4.7)	538 (4.2)	11 (2.6)	541 (7.1)	9.4 (0.15)	-0.9 (0.23) ▼
Germany	39 (3.8)	531 (3.3)	50 (3.7)	517 (2.7)	10 (2.4)	501 (10.6)	9.2 (0.10)	-0.3 (0.13)
Jordan	36 (4.0)	411 (6.0)	40 (3.9)	375 (6.7)	24 (3.2)	376 (9.0)	9.0 (0.17)	◊ ◊
Oman	34 (3.4)	426 (6.0)	36 (3.0)	419 (4.8)	29 (2.8)	434 (4.8)	8.6 (0.15)	0.2 (0.21)
Kuwait	25 (3.9)	373 (8.3)	40 (4.4)	344 (7.0)	35 (3.5)	342 (10.3)	8.3 (0.19)	◊ ◊
South Africa (5)	23 (3.1)	406 (13.6)	56 (3.5)	369 (5.4)	22 (3.1)	365 (8.3)	8.7 (0.11)	◊ ◊
Morocco	21 (3.0)	394 (8.7)	30 (3.0)	367 (6.8)	49 (3.2)	377 (4.4)	7.7 (0.16)	0.5 (0.21)
Indonesia	18 (2.9)	407 (9.9)	28 (3.3)	408 (6.6)	54 (3.6)	389 (5.9)	7.4 (0.16)	◊ ◊
International Avg.	60 (0.5)	512 (0.7)	31 (0.5)	497 (0.9)	10 (0.3)	468 (2.3)		

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 7.1: School Discipline Problems – Principals' Reports (Continued)

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Dubai, UAE	83 (0.2)	520 (1.6)	14 (0.2)	466 (2.6)	3 (0.1)	401 (5.8)	11.0 (0.01)	0.4 (0.01) ▲
Quebec, Canada	77 (4.8)	542 (4.3)	23 (4.8)	520 (6.6)	0 (0.0)	~ ~	10.7 (0.18)	0.7 (0.22) ▲
Norway (4)	72 (4.6)	494 (2.4)	26 (4.3)	496 (4.7)	2 (1.6)	~ ~	10.6 (0.14)	0.7 (0.19) ▲
Ontario, Canada	58 (5.5)	518 (3.3)	38 (5.3)	503 (3.5)	4 (1.7)	484 (12.5)	9.9 (0.16)	-0.5 (0.21)
Florida, US r	57 (8.1)	553 (7.5)	39 (8.3)	543 (7.3)	4 (2.8)	480 (11.9)	10.0 (0.22)	r -0.3 (0.30)
Buenos Aires, Argentina s	53 (5.7)	448 (5.0)	35 (5.5)	420 (7.1)	13 (3.8)	421 (18.1)	9.5 (0.16)	◊ ◊
Abu Dhabi, UAE	51 (4.6)	423 (8.7)	41 (4.7)	409 (8.6)	8 (2.5)	381 (22.6)	9.8 (0.13)	-0.1 (0.22)

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

To what degree is each of the following a problem among fourth grade students in your school?

	Not a problem	Minor problem	Moderate problem	Serious problem
1) Arriving late at school	○	○	○	○
2) Absenteeism (i.e., unjustified absences)	○	○	○	○
3) Classroom disturbance	○	○	○	○
4) Cheating	○	○	○	○
5) Profanity	○	○	○	○
6) Vandalism	○	○	○	○
7) Theft	○	○	○	○
8) Intimidation or verbal abuse among students (including texting, emailing, etc.)	○	○	○	○
9) Physical fights among students	○	○	○	○
10) Intimidation or verbal abuse of teachers or staff (including texting, emailing, etc.)	○	○	○	○

Hardly Any Problems | 9.7 | Minor Problems | 7.6 | Moderate to Severe Problems

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Exhibit 7.2: School Discipline Problems – Principals' Reports

Reported by Principals

Students were scored according to their principals' responses concerning eleven potential school problems on the *School Discipline Problems* scale. Students in schools with **Hardly Any Problems** had a score on the scale of at least 10.8, which corresponds to their principals reporting "not a problem" for six of the eleven issues and "minor problem" for the other five, on average. Students in schools with **Moderate to Severe Problems** had a score no higher than 8.0, which corresponds to their principals reporting "moderate problem" for six of the eleven issues and "minor problem" for the other five, on average. All other students attended schools with **Minor Problems**.

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Singapore	74 (0.0)	630 (3.4)	26 (0.0)	595 (7.1)	0 (0.0)	~ ~	11.7 (0.00)	0.7 (0.00) ▲
England r	73 (4.5)	535 (6.3)	27 (4.5)	504 (10.7)	0 (0.0)	~ ~	11.6 (0.13)	r 1.0 (0.20) ▲
Norway (9)	67 (4.5)	513 (2.7)	33 (4.5)	509 (4.6)	0 (0.0)	~ ~	11.2 (0.13)	◊ ◊
Hong Kong SAR	66 (4.5)	602 (6.8)	33 (4.6)	574 (8.5)	1 (1.1)	~ ~	11.4 (0.15)	0.4 (0.21)
Kazakhstan	65 (4.2)	536 (7.1)	18 (3.3)	507 (12.1)	17 (3.2)	517 (13.3)	10.8 (0.23)	-0.9 (0.26) ▼
Ireland	64 (3.9)	531 (3.3)	34 (4.0)	514 (6.0)	2 (1.2)	~ ~	10.9 (0.13)	◊ ◊
Georgia	57 (3.8)	451 (5.2)	40 (3.8)	456 (5.1)	3 (1.0)	474 (28.7)	10.8 (0.12)	0.0 (0.16)
Chinese Taipei	57 (3.8)	610 (3.8)	42 (3.7)	586 (4.5)	1 (0.8)	~ ~	11.1 (0.13)	-0.3 (0.20)
Russian Federation	56 (3.7)	545 (6.4)	43 (3.5)	530 (6.0)	1 (0.8)	~ ~	10.8 (0.08)	0.2 (0.11)
Iran, Islamic Rep. of	55 (3.4)	446 (6.4)	41 (3.4)	423 (5.5)	4 (1.1)	436 (17.1)	11.0 (0.13)	-0.4 (0.17)
Korea, Rep. of	55 (4.7)	606 (3.9)	38 (4.6)	606 (3.8)	7 (2.3)	600 (7.2)	11.0 (0.17)	0.9 (0.25) ▲
United Arab Emirates	54 (2.3)	483 (3.3)	40 (2.2)	445 (3.3)	6 (0.9)	403 (7.9)	11.0 (0.08)	0.8 (0.11) ▲
Japan	54 (3.9)	595 (3.4)	37 (4.2)	579 (4.9)	9 (2.3)	571 (11.9)	10.5 (0.13)	0.5 (0.22)
Bahrain	51 (0.2)	465 (2.1)	36 (0.2)	438 (2.3)	13 (0.2)	455 (5.0)	10.4 (0.02)	0.5 (0.02) ▲
Lebanon	51 (4.6)	448 (5.1)	29 (4.3)	436 (7.1)	20 (3.5)	440 (9.6)	10.2 (0.23)	0.0 (0.30)
Qatar	51 (0.7)	439 (4.6)	34 (0.7)	436 (3.8)	15 (0.3)	434 (5.7)	10.2 (0.02)	-0.4 (0.05) ▼
Oman	50 (3.9)	411 (3.8)	27 (3.6)	402 (7.2)	23 (3.1)	388 (6.4)	10.2 (0.19)	0.4 (0.27)
Malta	50 (0.1)	520 (1.5)	45 (0.1)	466 (1.5)	5 (0.1)	465 (3.8)	10.6 (0.00)	◊ ◊
Malaysia	50 (4.6)	477 (5.3)	48 (4.4)	454 (5.7)	3 (2.1)	455 (20.5)	10.8 (0.15)	0.9 (0.18) ▲
Saudi Arabia	49 (4.3)	383 (7.0)	31 (3.9)	354 (6.5)	20 (3.5)	356 (9.5)	10.2 (0.24)	0.5 (0.32)
Australia	48 (3.2)	528 (4.7)	51 (3.2)	487 (4.4)	1 (0.6)	~ ~	10.6 (0.09)	0.5 (0.13) ▲
Canada	45 (4.1)	538 (2.8)	54 (4.1)	520 (3.2)	1 (0.7)	~ ~	10.6 (0.12)	◊ ◊
Thailand	42 (4.0)	450 (7.3)	53 (4.0)	418 (6.5)	5 (1.7)	405 (14.1)	10.4 (0.14)	0.4 (0.19)
Lithuania	40 (4.2)	524 (5.2)	57 (4.2)	503 (4.2)	2 (1.1)	~ ~	10.3 (0.10)	0.2 (0.15)
United States	34 (3.0)	539 (5.6)	64 (3.4)	511 (3.9)	2 (1.0)	~ ~	10.2 (0.09)	0.2 (0.12)
Jordan	34 (3.5)	398 (5.6)	43 (3.9)	377 (5.4)	23 (3.3)	382 (6.9)	9.6 (0.18)	0.6 (0.23)
Slovenia	32 (3.6)	519 (4.5)	63 (3.7)	516 (2.6)	5 (1.8)	509 (7.9)	10.0 (0.12)	0.1 (0.17)
New Zealand	31 (4.6)	507 (4.0)	66 (4.6)	485 (4.8)	3 (1.5)	438 (18.0)	10.2 (0.13)	0.5 (0.16) ▲
Chile	29 (3.8)	454 (7.3)	58 (3.9)	421 (4.9)	13 (3.0)	398 (6.7)	9.8 (0.12)	0.1 (0.20)
Hungary	29 (3.9)	540 (8.4)	63 (4.1)	512 (5.1)	8 (2.1)	428 (12.2)	10.1 (0.12)	0.5 (0.16) ▲
Italy	27 (4.2)	501 (6.2)	61 (4.5)	490 (3.7)	12 (2.6)	493 (11.0)	9.7 (0.12)	0.2 (0.18)
Kuwait	27 (3.3)	423 (11.1)	50 (4.0)	385 (4.9)	23 (3.5)	375 (11.2)	9.4 (0.15)	◊ ◊
Israel	26 (3.6)	535 (9.3)	61 (3.6)	511 (6.6)	13 (2.3)	464 (12.2)	9.6 (0.14)	0.2 (0.21)
Sweden	26 (4.3)	515 (4.6)	70 (4.6)	496 (3.4)	4 (1.8)	483 (26.5)	9.8 (0.13)	r 0.3 (0.16)
Turkey	19 (2.6)	499 (12.5)	49 (3.8)	455 (5.1)	32 (3.4)	437 (7.6)	8.8 (0.14)	-0.4 (0.20)
Egypt	19 (3.4)	394 (10.7)	42 (3.6)	396 (6.4)	40 (3.6)	388 (7.2)	8.4 (0.18)	◊ ◊
Morocco	13 (2.1)	401 (8.4)	34 (3.4)	384 (3.9)	53 (3.2)	381 (3.1)	8.1 (0.12)	-0.1 (0.18)
Botswana (9)	11 (2.8)	414 (9.6)	68 (3.8)	394 (2.8)	22 (3.5)	372 (5.3)	9.0 (0.11)	0.1 (0.14)
South Africa (9)	10 (2.1)	408 (19.4)	56 (3.7)	384 (6.9)	34 (3.8)	344 (4.4)	8.8 (0.12)	0.0 (0.15)
International Avg.	43 (0.6)	495 (1.1)	45 (0.6)	473 (0.9)	11 (0.4)	439 (2.4)		

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

▲ Significantly higher than 2011
▼ Significantly lower than 2011

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

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Exhibit 7.2: School Discipline Problems – Principals' Reports (Continued)

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Dubai, UAE	76 (0.3)	528 (2.6)	22 (0.3)	467 (3.7)	2 (0.1)	~ ~	12.1 (0.01)	1.1 (0.02) ▲
Norway (8)	73 (4.1)	490 (2.3)	27 (4.1)	481 (5.0)	0 (0.0)	~ ~	11.6 (0.13)	1.5 (0.18) ▲
Quebec, Canada	56 (6.1)	556 (4.1)	44 (6.1)	541 (5.8)	1 (0.6)	~ ~	10.9 (0.19)	0.9 (0.22) ▲
Abu Dhabi, UAE	41 (4.2)	445 (8.5)	53 (4.1)	438 (6.0)	7 (1.7)	394 (14.9)	10.5 (0.14)	0.3 (0.22)
Ontario, Canada	39 (5.3)	529 (3.7)	59 (5.2)	516 (4.1)	2 (1.1)	~ ~	10.4 (0.16)	0.2 (0.22)
Florida, US s	29 (8.2)	490 (15.2)	71 (8.2)	503 (11.6)	0 (0.0)	~ ~	10.2 (0.33)	s 0.4 (0.40)
Buenos Aires, Argentina s	21 (4.2)	460 (9.1)	61 (5.7)	384 (7.4)	18 (4.4)	365 (10.1)	9.5 (0.15)	◊ ◊

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

To what degree is each of the following a problem among eighth grade students in your school?

	Not a problem	Minor problem	Moderate problem	Serious problem
1) Arriving late at school	○	○	○	○
2) Absenteeism (i.e., unjustified absences)	○	○	○	○
3) Classroom disturbance	○	○	○	○
4) Cheating	○	○	○	○
5) Profanity	○	○	○	○
6) Vandalism	○	○	○	○
7) Theft	○	○	○	○
8) Intimidation or verbal abuse among students (including texting, emailing, etc.)	○	○	○	○
9) Physical injury to other students	○	○	○	○
10) Intimidation or verbal abuse of teachers or staff (including texting, emailing, etc.)	○	○	○	○
11) Physical injury to teachers or staff	○	○	○	○

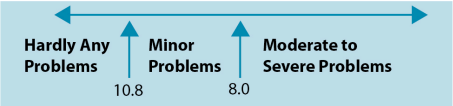

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Exhibit 7.3: Safe and Orderly School – Teachers' Reports

Reported by Teachers

Students were scored according to their teachers' degree of agreement with eight statements on the *Safe and Orderly School* scale. Students in **Very Safe and Orderly** schools had a score on the scale of at least 10.0, which corresponds to their teachers "agreeing a lot" with four of the eight qualities of a safe and orderly school and "agreeing a little" with the other four, on average. Students in **Less than Safe and Orderly** schools had a score no higher than 6.7, which corresponds to their teachers "disagreeing a little" with four of the eight qualities and "agreeing a little" with the other four, on average. All other students attended **Safe and Orderly** schools.

Country	Very Safe and Orderly		Safe and Orderly		Less than Safe and Orderly		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Indonesia	89 (2.1)	399 (3.7)	11 (2.1)	390 (12.3)	0 (0.1)	~ ~	12.1 (0.11)	◊ ◊
Northern Ireland r	85 (3.1)	576 (3.1)	15 (3.1)	554 (12.1)	0 (0.0)	~ ~	12.0 (0.16)	r 0.5 (0.21)
Ireland	83 (2.7)	551 (2.2)	14 (2.7)	536 (5.6)	2 (1.3)	~ ~	11.7 (0.15)	0.4 (0.21)
Qatar	77 (3.2)	444 (4.3)	21 (3.2)	432 (9.0)	2 (1.2)	~ ~	11.3 (0.15)	0.9 (0.19) ▲
Spain	76 (2.6)	512 (2.6)	21 (2.6)	489 (5.0)	3 (1.0)	442 (19.5)	11.1 (0.11)	1.4 (0.20) ▲
England	76 (3.7)	550 (4.0)	24 (3.7)	536 (6.2)	0 (0.4)	~ ~	11.3 (0.17)	0.6 (0.25) ▲
Kazakhstan	75 (3.7)	545 (5.6)	25 (3.7)	544 (8.2)	0 (0.0)	~ ~	11.5 (0.16)	0.7 (0.22) ▲
Australia	75 (2.8)	529 (4.1)	23 (2.9)	490 (5.8)	2 (0.8)	~ ~	11.4 (0.13)	r 0.3 (0.21)
Norway (5)	72 (3.0)	553 (3.0)	24 (2.9)	540 (3.6)	4 (1.4)	554 (20.1)	10.8 (0.14)	◊ ◊
New Zealand	71 (2.5)	504 (2.6)	26 (2.2)	461 (5.0)	3 (0.8)	446 (12.7)	11.0 (0.12)	0.0 (0.15)
Iran, Islamic Rep. of	70 (2.5)	432 (4.1)	27 (2.5)	436 (6.8)	3 (1.1)	379 (23.5)	10.7 (0.12)	0.4 (0.19)
Bulgaria	69 (3.5)	533 (5.3)	29 (3.7)	504 (8.9)	2 (1.8)	~ ~	10.4 (0.13)	◊ ◊
Portugal	65 (3.4)	547 (3.1)	32 (3.5)	534 (4.4)	3 (1.1)	503 (24.5)	10.6 (0.13)	1.0 (0.23) ▲
Oman	64 (2.9)	430 (3.2)	33 (3.0)	418 (5.2)	3 (1.1)	421 (9.5)	10.5 (0.12)	0.6 (0.15) ▲
Hong Kong SAR	64 (4.5)	616 (3.4)	34 (4.5)	612 (6.5)	2 (1.3)	~ ~	10.6 (0.17)	0.4 (0.24)
Singapore	63 (2.6)	619 (4.5)	35 (2.6)	616 (6.5)	2 (0.6)	~ ~	10.7 (0.11)	0.4 (0.15) ▲
Georgia	62 (3.8)	468 (5.3)	37 (3.9)	456 (6.3)	1 (0.6)	~ ~	10.4 (0.14)	-0.9 (0.18) ▼
United Arab Emirates	62 (1.8)	473 (3.5)	35 (1.8)	420 (4.6)	3 (0.8)	409 (23.1)	10.6 (0.08)	-0.2 (0.11)
Cyprus	60 (3.8)	530 (3.1)	36 (3.7)	513 (4.1)	4 (1.3)	514 (7.7)	10.5 (0.17)	◊ ◊
Netherlands r	60 (3.7)	534 (2.2)	39 (3.8)	523 (2.7)	1 (1.1)	~ ~	10.3 (0.16)	r 0.1 (0.24)
Saudi Arabia	59 (3.0)	397 (5.5)	34 (3.2)	361 (6.9)	7 (2.0)	379 (19.9)	10.1 (0.13)	-0.3 (0.21)
Lithuania	57 (4.3)	535 (3.7)	42 (4.2)	536 (4.5)	1 (0.8)	~ ~	10.3 (0.13)	0.6 (0.18) ▲
Bahrain	56 (2.5)	464 (2.4)	37 (2.5)	442 (2.8)	8 (0.9)	427 (5.6)	10.2 (0.13)	-0.1 (0.22)
Canada	55 (2.2)	512 (2.8)	42 (2.3)	511 (4.8)	3 (0.8)	484 (14.1)	10.4 (0.09)	◊ ◊
Kuwait	55 (3.5)	355 (5.3)	41 (3.4)	347 (9.0)	3 (1.0)	360 (36.1)	10.1 (0.15)	◊ ◊
United States	55 (2.5)	552 (3.0)	38 (2.3)	526 (4.4)	7 (1.4)	500 (11.1)	10.3 (0.12)	-0.2 (0.15)
Russian Federation	55 (3.8)	566 (4.6)	43 (3.9)	562 (6.5)	2 (0.9)	~ ~	10.1 (0.12)	0.2 (0.21)
Czech Republic	54 (3.6)	532 (3.0)	45 (3.5)	524 (3.7)	2 (0.8)	~ ~	9.8 (0.12)	0.3 (0.17)
Italy	53 (3.3)	508 (4.0)	44 (3.3)	507 (3.7)	3 (1.5)	482 (16.0)	10.0 (0.14)	1.4 (0.19) ▲
Slovak Republic	53 (3.3)	504 (3.3)	44 (3.3)	494 (4.0)	3 (1.0)	453 (19.4)	9.8 (0.11)	0.4 (0.14) ▲
Serbia	52 (3.5)	521 (4.0)	41 (3.6)	513 (6.4)	7 (1.6)	522 (9.6)	10.1 (0.14)	0.7 (0.21) ▲
Jordan	52 (3.9)	397 (4.8)	39 (3.9)	385 (5.9)	9 (2.1)	353 (10.8)	10.0 (0.16)	◊ ◊
Poland	50 (3.8)	536 (3.0)	48 (3.6)	534 (3.1)	2 (0.9)	~ ~	9.9 (0.12)	◊ ◊
Turkey	49 (3.3)	497 (5.6)	44 (3.3)	472 (4.7)	7 (1.6)	454 (15.6)	9.7 (0.14)	0.8 (0.23) ▲
South Africa (5)	49 (3.8)	385 (7.3)	41 (3.7)	366 (7.3)	10 (2.2)	373 (10.8)	9.7 (0.15)	◊ ◊
Croatia	48 (3.5)	501 (2.4)	50 (3.5)	503 (2.8)	2 (1.0)	~ ~	9.9 (0.13)	-0.9 (0.18) ▼
Chile	47 (4.2)	475 (4.5)	41 (4.4)	451 (4.9)	12 (2.6)	438 (6.8)	9.6 (0.20)	0.4 (0.27)
Germany	46 (3.2)	529 (3.1)	50 (3.1)	516 (3.7)	5 (1.5)	496 (11.4)	9.7 (0.11)	-0.1 (0.17)
Hungary	46 (3.9)	539 (4.9)	48 (3.9)	524 (5.9)	6 (2.2)	480 (22.4)	9.6 (0.15)	-0.2 (0.20)
Korea, Rep. of	44 (3.7)	615 (3.8)	54 (3.6)	603 (2.8)	2 (1.2)	~ ~	10.0 (0.17)	1.3 (0.25) ▲
Belgium (Flemish)	43 (3.5)	552 (3.6)	52 (3.6)	542 (3.3)	5 (1.6)	530 (9.8)	9.6 (0.11)	-0.1 (0.16)
Morocco	43 (2.9)	388 (6.0)	47 (3.1)	372 (5.5)	11 (1.8)	352 (9.8)	9.6 (0.13)	0.8 (0.22) ▲
Denmark	41 (3.6)	547 (4.9)	53 (3.8)	533 (3.9)	6 (1.8)	525 (10.7)	9.5 (0.15)	-1.1 (0.19) ▼
France	40 (3.6)	501 (4.2)	54 (3.8)	483 (3.5)	6 (1.6)	444 (10.7)	9.4 (0.13)	◊ ◊
Sweden	37 (4.3)	533 (3.9)	57 (4.4)	515 (3.5)	6 (1.9)	467 (17.4)	9.6 (0.15)	r -0.1 (0.22)
Finland	37 (3.1)	540 (2.5)	60 (3.1)	534 (2.4)	3 (1.0)	509 (15.3)	9.5 (0.11)	0.2 (0.17)
Chinese Taipei	35 (3.6)	597 (3.0)	61 (3.9)	596 (2.6)	4 (1.5)	605 (13.9)	9.4 (0.14)	0.4 (0.21)
Slovenia	29 (3.2)	522 (3.2)	64 (3.4)	521 (2.5)	7 (1.6)	510 (5.7)	9.0 (0.10)	0.1 (0.15)
Japan	7 (1.8)	606 (6.2)	83 (2.5)	593 (2.1)	9 (2.2)	577 (4.7)	8.2 (0.08)	0.3 (0.12)
International Avg.	56 (0.5)	511 (0.6)	40 (0.5)	497 (0.8)	4 (0.2)	464 (2.9)		

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 7.3: Safe and Orderly School – Teachers' Reports (Continued)

Country	Very Safe and Orderly		Safe and Orderly		Less than Safe and Orderly		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Norway (4)	73 (3.4)	497 (2.6)	25 (3.5)	494 (5.1)	2 (1.2)	~ ~	10.9 (0.15)	0.2 (0.23)
Dubai, UAE	69 (2.4)	529 (2.6)	31 (2.4)	470 (3.8)	1 (0.4)	~ ~	11.2 (0.10)	r -0.2 (0.13)
Florida, US r	53 (4.8)	565 (5.7)	34 (5.3)	531 (7.2)	13 (3.1)	515 (13.4)	10.0 (0.25)	r -0.5 (0.35)
Ontario, Canada	52 (3.2)	516 (3.1)	45 (3.2)	513 (3.8)	3 (0.9)	486 (14.7)	10.3 (0.15)	-0.2 (0.22)
Abu Dhabi, UAE	51 (4.2)	445 (9.2)	44 (4.1)	392 (7.5)	5 (1.8)	397 (38.2)	9.9 (0.18)	-0.8 (0.22) ▼
Quebec, Canada	48 (5.3)	538 (5.3)	49 (5.6)	535 (5.6)	3 (2.1)	514 (16.9)	9.9 (0.17)	0.1 (0.25)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x	x x

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Thinking about your current school, indicate the extent to which you agree or disagree with each of the following statements.

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) This school is located in a safe neighborhood	○	○	○	○
2) I feel safe at this school	○	○	○	○
3) This school's security policies and practices are sufficient	○	○	○	○
4) The students behave in an orderly manner	○	○	○	○
5) The students are respectful of the teachers	○	○	○	○
6) The students respect school property	○	○	○	○
7) This school has clear rules about student conduct	○	○	○	○
8) This school's rules are enforced in a fair and consistent manner	○	○	○	○

Very Safe and Orderly — 10.0 — Safe and Orderly — 6.7 — Less than Safe and Orderly

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Exhibit 7.4: Safe and Orderly School – Teachers' Reports

Reported by Teachers

Students were scored according to their teachers' degree of agreement with eight statements on the *Safe and Orderly School* scale. Students in **Very Safe and Orderly** schools had a score on the scale of at least 10.6, which corresponds to their teachers "agreeing a lot" with four of the eight qualities of a safe and orderly school and "agreeing a little" with the other four, on average. Students in **Less than Safe and Orderly** schools had a score no higher than 7.2, which corresponds to their teachers "disagreeing a little" with four of the eight qualities and "agreeing a little" with the other four, on average. All other students attended **Safe and Orderly** schools.

Country	Very Safe and Orderly		Safe and Orderly		Less than Safe and Orderly		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Qatar	75 (2.8)	440 (4.0)	23 (2.8)	424 (8.1)	2 (0.9)	~ ~	11.5 (0.10)	0.5 (0.15) ▲
Norway (9)	72 (3.4)	515 (2.6)	28 (3.3)	506 (3.6)	0 (0.4)	~ ~	11.3 (0.11)	◊ ◊
Ireland	70 (2.7)	534 (3.1)	26 (2.4)	505 (6.4)	4 (1.3)	452 (25.9)	11.6 (0.13)	◊ ◊
Lebanon	67 (4.4)	447 (5.0)	30 (4.3)	434 (7.6)	3 (1.5)	417 (32.8)	11.1 (0.17)	1.3 (0.25) ▲
United Arab Emirates	67 (2.0)	482 (3.2)	32 (1.9)	433 (5.2)	2 (0.5)	~ ~	11.4 (0.09)	0.5 (0.11) ▲
Kazakhstan	61 (4.0)	529 (6.5)	38 (4.0)	526 (8.3)	0 (0.2)	~ ~	11.4 (0.16)	0.3 (0.21)
Australia	60 (3.0)	523 (3.6)	33 (2.7)	492 (4.5)	7 (1.6)	445 (10.1)	11.0 (0.16)	r 0.5 (0.26)
Israel	60 (2.9)	523 (6.3)	35 (2.9)	498 (7.8)	5 (0.9)	463 (19.3)	10.9 (0.12)	0.0 (0.17)
Singapore	59 (2.3)	629 (4.7)	38 (2.2)	609 (5.5)	3 (0.9)	586 (20.0)	11.2 (0.11)	0.5 (0.14) ▲
Russian Federation	57 (2.9)	545 (4.9)	42 (2.8)	528 (7.4)	2 (1.0)	~ ~	10.7 (0.10)	0.7 (0.18) ▲
Hong Kong SAR	56 (4.9)	606 (5.6)	43 (4.9)	580 (8.6)	1 (0.2)	~ ~	10.9 (0.16)	0.4 (0.23)
Kuwait	55 (4.1)	395 (7.2)	41 (4.1)	389 (8.8)	4 (1.4)	379 (12.5)	10.5 (0.13)	◊ ◊
Iran, Islamic Rep. of	54 (3.3)	446 (6.4)	40 (3.4)	429 (6.4)	6 (1.5)	391 (10.3)	10.7 (0.14)	0.1 (0.18)
Oman	52 (3.1)	416 (4.1)	46 (3.1)	391 (3.7)	2 (1.0)	~ ~	10.7 (0.14)	0.8 (0.18) ▲
Bahrain	50 (2.9)	464 (2.7)	44 (2.9)	443 (3.3)	6 (1.3)	453 (8.0)	10.2 (0.10)	0.0 (0.15)
New Zealand	50 (3.6)	507 (5.0)	42 (3.5)	479 (4.3)	8 (1.4)	482 (19.7)	10.7 (0.14)	0.1 (0.20)
Canada	50 (3.2)	533 (2.5)	45 (3.1)	529 (3.7)	4 (1.0)	507 (14.0)	10.7 (0.16)	◊ ◊
England	50 (3.9)	527 (7.2)	44 (3.8)	514 (8.8)	6 (2.0)	461 (9.0)	10.6 (0.17)	0.0 (0.26)
Egypt	49 (4.2)	407 (5.0)	45 (4.2)	378 (6.3)	6 (1.8)	373 (15.9)	10.4 (0.15)	◊ ◊
Lithuania	49 (4.1)	514 (4.2)	46 (4.3)	507 (4.9)	5 (1.9)	507 (14.7)	10.3 (0.15)	0.4 (0.18)
Saudi Arabia	48 (4.6)	378 (6.4)	42 (4.4)	361 (5.6)	10 (2.5)	339 (12.6)	10.3 (0.18)	0.0 (0.23)
Malta	48 (0.1)	509 (1.7)	46 (0.1)	485 (1.6)	6 (0.1)	447 (4.5)	10.4 (0.01)	◊ ◊
United States	46 (3.0)	538 (4.1)	41 (2.7)	507 (5.1)	13 (2.0)	482 (9.2)	10.3 (0.16)	r 0.0 (0.21)
Georgia	45 (4.3)	465 (5.3)	53 (4.1)	445 (4.5)	2 (1.4)	~ ~	10.3 (0.15)	-0.9 (0.19) ▼
Thailand	44 (3.5)	441 (8.0)	51 (3.8)	423 (6.4)	6 (1.8)	430 (16.0)	10.3 (0.13)	-0.1 (0.20)
Hungary	41 (3.8)	527 (5.5)	52 (3.7)	511 (6.1)	7 (1.7)	459 (17.2)	10.0 (0.14)	0.1 (0.18)
Jordan	41 (4.0)	400 (5.2)	48 (4.0)	380 (4.0)	11 (3.0)	360 (13.3)	9.9 (0.17)	0.3 (0.21)
Chinese Taipei	38 (3.4)	613 (5.1)	57 (3.7)	590 (3.9)	5 (1.7)	594 (9.7)	10.1 (0.14)	0.9 (0.21) ▲
Chile	38 (3.8)	451 (5.8)	49 (4.2)	424 (6.4)	14 (2.5)	390 (7.4)	9.7 (0.16)	0.3 (0.24)
Malaysia	35 (3.6)	492 (6.8)	62 (3.5)	452 (5.3)	4 (1.9)	461 (10.9)	9.9 (0.14)	-0.3 (0.22)
South Africa (9)	33 (3.5)	397 (10.4)	45 (3.3)	366 (6.3)	22 (3.0)	348 (4.9)	9.2 (0.15)	0.6 (0.21) ▲
Sweden	31 (3.8)	511 (5.0)	63 (4.0)	497 (3.7)	6 (1.9)	484 (12.2)	9.8 (0.14)	r 0.3 (0.18)
Turkey	30 (3.6)	479 (7.6)	47 (3.9)	463 (7.1)	23 (2.9)	418 (8.9)	9.2 (0.16)	-0.1 (0.20)
Korea, Rep. of	27 (2.8)	613 (3.8)	64 (3.1)	604 (3.6)	8 (2.2)	598 (12.0)	9.6 (0.12)	1.2 (0.16) ▲
Morocco	26 (2.8)	399 (5.0)	52 (3.7)	382 (3.3)	23 (2.4)	372 (4.6)	9.1 (0.13)	0.1 (0.16)
Slovenia	19 (2.4)	527 (6.9)	71 (2.7)	515 (2.1)	10 (1.7)	512 (5.3)	9.3 (0.10)	0.3 (0.14)
Italy	17 (3.0)	515 (5.7)	75 (3.1)	492 (3.1)	8 (1.7)	461 (10.0)	9.1 (0.12)	0.3 (0.17)
Botswana (9)	15 (3.0)	415 (8.6)	53 (4.6)	389 (3.4)	32 (4.4)	385 (3.7)	8.3 (0.20)	0.3 (0.26)
Japan	14 (2.5)	583 (6.3)	73 (3.4)	590 (2.8)	14 (2.6)	574 (7.1)	8.8 (0.11)	0.3 (0.17)
International Avg.	46 (0.5)	493 (0.9)	46 (0.6)	474 (0.9)	8 (0.3)	453 (2.5)		

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 7.4: Safe and Orderly School – Teachers' Reports (Continued)

Country	Very Safe and Orderly		Safe and Orderly		Less than Safe and Orderly		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Dubai, UAE	80 (1.7)	524 (3.0)	19 (1.8)	471 (6.2)	2 (0.8)	~ ~	12.2 (0.11)	0.9 (0.14) ▲
Norway (8)	63 (3.9)	490 (2.5)	37 (3.9)	482 (3.8)	1 (0.6)	~ ~	11.2 (0.15)	0.3 (0.21)
Abu Dhabi, UAE	56 (4.3)	459 (7.7)	43 (4.3)	420 (7.7)	1 (0.4)	~ ~	10.9 (0.14)	0.1 (0.19)
Ontario, Canada	53 (3.9)	531 (2.7)	43 (3.9)	518 (5.0)	5 (1.3)	503 (12.8)	10.7 (0.21)	0.1 (0.28)
Quebec, Canada	41 (5.7)	554 (5.2)	55 (5.8)	548 (4.7)	4 (2.3)	518 (31.4)	10.4 (0.23)	0.5 (0.27)
Florida, US r	34 (7.5)	519 (15.5)	51 (6.8)	497 (9.0)	15 (4.5)	470 (19.6)	9.5 (0.38)	r 0.0 (0.45)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x	x x

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Thinking about your current school, indicate the extent to which you agree or disagree with each of the following statements.

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) This school is located in a safe neighborhood	○	○	○	○
2) I feel safe at this school	○	○	○	○
3) This school's security policies and practices are sufficient	○	○	○	○
4) The students behave in an orderly manner	○	○	○	○
5) The students are respectful of the teachers	○	○	○	○
6) The students respect school property	○	○	○	○
7) This school has clear rules about student conduct	○	○	○	○
8) This school's rules are enforced in a fair and consistent manner	○	○	○	○

Very Safe and Orderly | 10.6 | Safe and Orderly | 7.2 | Less than Safe and Orderly

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Exhibit 7.5: Student Bullying

Reported by Students

Students were scored according to their responses to how often they experienced eight bullying behaviors on the *Student Bullying* scale. Students bullied **Almost Never** had a score on the scale of at least 9.6, which corresponds to "never" experiencing four of the eight bullying behaviors and experiencing each of the other four behaviors "a few times a year," on average. Students bullied **About Weekly** had a score no higher than 8.0, which corresponds to their experiencing each of four of the eight behaviors "once or twice a month" and each of the other four "a few times a year," on average. All other students were bullied **About Monthly**.

Country	Almost Never		About Monthly		About Weekly		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Korea, Rep. of	76 (1.0)	608 (2.3)	20 (0.8)	609 (3.5)	4 (0.4)	604 (6.9)	11.0 (0.05)
Kazakhstan	75 (1.1)	549 (4.6)	18 (0.8)	539 (7.0)	7 (0.6)	517 (7.5)	11.1 (0.07)
Ireland	73 (1.2)	555 (2.2)	20 (1.0)	538 (3.7)	6 (0.4)	496 (5.9)	10.8 (0.06)
Croatia	73 (1.2)	507 (1.8)	19 (0.9)	493 (3.7)	8 (0.6)	485 (4.9)	10.8 (0.06)
Georgia	73 (1.1)	476 (3.3)	18 (0.7)	459 (4.7)	9 (0.7)	413 (7.8)	10.8 (0.05)
Serbia	73 (1.0)	522 (3.9)	19 (0.9)	523 (5.2)	8 (0.5)	488 (6.8)	10.9 (0.05)
Poland	73 (1.0)	540 (2.1)	19 (0.8)	531 (3.8)	8 (0.5)	502 (5.5)	10.7 (0.05)
Finland	71 (1.2)	540 (1.9)	22 (0.9)	531 (3.3)	7 (0.5)	504 (5.4)	10.5 (0.05)
Norway (5)	70 (1.3)	554 (2.6)	23 (1.0)	543 (3.2)	7 (0.6)	521 (6.9)	10.5 (0.05)
Japan	68 (1.3)	598 (2.0)	23 (1.0)	588 (3.1)	8 (0.6)	566 (6.1)	10.6 (0.05)
France	65 (1.2)	492 (2.9)	26 (1.0)	486 (4.0)	8 (0.6)	467 (6.4)	10.4 (0.05)
Sweden	65 (1.3)	526 (2.8)	28 (1.1)	512 (3.6)	7 (0.5)	482 (6.4)	10.3 (0.05)
Northern Ireland	64 (1.5)	578 (3.0)	27 (1.1)	568 (4.4)	10 (0.7)	529 (7.2)	10.3 (0.06)
Chile	60 (1.3)	468 (2.6)	24 (0.9)	460 (3.6)	16 (0.8)	426 (4.2)	10.1 (0.06)
Czech Republic	60 (1.1)	535 (2.5)	28 (0.9)	526 (3.2)	12 (0.7)	501 (4.2)	10.2 (0.05)
Netherlands	59 (1.4)	533 (1.9)	31 (0.9)	531 (2.4)	10 (0.9)	512 (3.5)	10.0 (0.05)
Hungary	58 (1.3)	541 (3.1)	31 (1.1)	523 (3.4)	11 (0.7)	489 (8.7)	10.0 (0.05)
Chinese Taipei	58 (1.1)	602 (1.9)	29 (1.0)	593 (3.0)	13 (0.7)	583 (4.2)	10.1 (0.04)
Denmark	58 (1.2)	546 (3.0)	32 (0.9)	536 (3.4)	10 (0.7)	514 (4.4)	10.0 (0.05)
Slovenia	58 (1.0)	526 (2.1)	29 (0.9)	521 (2.6)	14 (0.8)	499 (3.4)	10.0 (0.05)
Turkey	57 (1.1)	500 (3.2)	28 (0.8)	481 (3.4)	14 (0.7)	428 (5.8)	10.1 (0.05)
Germany r	57 (1.3)	531 (2.2)	30 (0.9)	526 (2.5)	13 (0.7)	503 (4.2)	10.0 (0.05)
Slovak Republic	57 (1.1)	507 (3.0)	30 (0.8)	494 (3.1)	13 (0.7)	472 (5.6)	10.1 (0.06)
Portugal	57 (1.0)	547 (2.3)	29 (0.9)	542 (3.1)	15 (0.9)	521 (4.6)	10.0 (0.04)
Lithuania	56 (1.3)	547 (2.7)	31 (1.0)	530 (3.2)	13 (0.7)	502 (4.9)	9.9 (0.05)
United States	56 (0.8)	550 (2.5)	29 (0.5)	540 (2.5)	15 (0.5)	510 (3.5)	9.9 (0.04)
Cyprus	55 (1.2)	534 (3.0)	29 (1.0)	523 (3.1)	16 (0.8)	497 (3.9)	9.9 (0.06)
Hong Kong SAR	54 (1.4)	618 (3.1)	32 (1.1)	613 (3.4)	14 (0.9)	603 (4.6)	9.9 (0.05)
England	54 (1.3)	553 (3.4)	31 (1.1)	546 (3.4)	15 (0.8)	522 (5.2)	9.8 (0.05)
Bulgaria	54 (1.9)	539 (5.5)	30 (1.1)	519 (4.8)	16 (1.1)	494 (6.9)	9.9 (0.08)
Canada	53 (0.9)	520 (2.3)	30 (0.6)	513 (2.2)	17 (0.8)	486 (3.4)	9.7 (0.04)
Jordan	52 (1.8)	411 (4.1)	26 (1.1)	395 (4.1)	21 (1.4)	339 (5.0)	9.8 (0.09)
Russian Federation	51 (1.3)	571 (3.3)	33 (0.9)	564 (4.7)	16 (0.6)	544 (5.2)	9.8 (0.05)
Italy	50 (1.0)	512 (2.8)	35 (0.9)	507 (3.2)	15 (0.7)	494 (4.7)	9.6 (0.04)
Iran, Islamic Rep. of	50 (1.6)	434 (4.4)	32 (0.9)	439 (4.2)	18 (1.1)	419 (7.0)	9.7 (0.07)
Spain	48 (1.0)	512 (2.8)	33 (0.6)	504 (3.0)	19 (0.8)	491 (3.7)	9.6 (0.05)
Kuwait	48 (1.2)	359 (3.4)	31 (0.8)	356 (6.5)	21 (0.9)	338 (8.3)	9.7 (0.06)
Saudi Arabia	47 (1.7)	405 (4.6)	27 (1.1)	386 (5.3)	26 (1.3)	356 (5.0)	9.5 (0.08)
Singapore	47 (0.9)	631 (3.8)	34 (0.6)	618 (4.0)	19 (0.7)	585 (5.3)	9.5 (0.03)
Belgium (Flemish)	47 (1.3)	547 (2.4)	36 (0.9)	550 (2.5)	17 (0.8)	532 (3.6)	9.6 (0.05)
Australia	45 (1.3)	529 (3.7)	36 (1.1)	518 (2.9)	20 (1.1)	490 (5.5)	9.4 (0.05)
Morocco	44 (1.5)	395 (4.0)	35 (1.1)	381 (4.1)	21 (1.0)	348 (5.7)	9.5 (0.06)
Indonesia	44 (1.4)	402 (4.1)	31 (1.0)	406 (4.1)	25 (1.0)	389 (5.0)	9.4 (0.07)
Qatar	43 (1.2)	457 (3.5)	28 (0.8)	449 (4.9)	28 (1.0)	408 (4.7)	9.3 (0.06)
United Arab Emirates	43 (1.0)	469 (3.0)	31 (0.5)	458 (3.1)	26 (0.8)	420 (3.4)	9.4 (0.05)
Oman	42 (1.6)	436 (3.1)	33 (1.0)	430 (3.3)	25 (1.0)	406 (3.7)	9.4 (0.06)
New Zealand	40 (1.0)	503 (3.1)	36 (0.7)	496 (2.7)	24 (0.7)	467 (3.5)	9.2 (0.04)
Bahrain	34 (0.7)	468 (1.8)	33 (0.6)	457 (2.5)	33 (0.7)	432 (2.4)	9.0 (0.03)
South Africa (5)	23 (1.0)	419 (6.2)	34 (0.9)	391 (3.5)	44 (1.5)	347 (3.9)	8.5 (0.05)
International Avg.	56 (0.2)	514 (0.5)	29 (0.1)	505 (0.5)	16 (0.1)	478 (0.8)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 7.5: Student Bullying (Continued)

Country	Almost Never		About Monthly		About Weekly		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Norway (4)	70 (1.2)	499 (2.3)	21 (0.9)	488 (3.6)	9 (0.6)	465 (7.1)	10.6 (0.05)
Florida, US	56 (1.6)	558 (5.7)	28 (1.1)	544 (5.1)	16 (1.0)	517 (6.1)	10.0 (0.07)
Quebec, Canada	54 (1.6)	541 (4.3)	31 (1.1)	538 (4.3)	14 (1.2)	515 (6.5)	9.9 (0.07)
Ontario, Canada	52 (1.3)	521 (2.3)	31 (0.8)	513 (3.2)	17 (1.2)	490 (4.0)	9.7 (0.05)
Buenos Aires, Argentina	50 (1.2)	445 (3.1)	29 (0.8)	444 (4.1)	21 (0.7)	413 (3.9)	9.6 (0.05)
Dubai, UAE	46 (1.3)	523 (2.1)	32 (0.9)	514 (2.8)	22 (1.0)	484 (3.5)	9.5 (0.06)
Abu Dhabi, UAE	39 (2.0)	439 (7.1)	31 (1.0)	430 (6.2)	30 (1.6)	388 (6.7)	9.1 (0.10)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

During this school year, how often have other students from your school done any of the following things to you (including through texting or the Internet)?

	Never	A few times a year	Once or twice a month	At least once a week
1) Made fun of me or called me names	○	○	○	○
2) Left me out of their games or activities	○	○	○	○
3) Spread lies about me	○	○	○	○
4) Stole something from me	○	○	○	○
5) Hit or hurt me (*e.g., shoving, hitting, kicking*)	○	○	○	○
6) Made me do things I didn't want to do	○	○	○	○
7) Shared embarrassing information about me	○	○	○	○
8) Threatened me	○	○	○	○

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Exhibit 7.6: Student Bullying

Reported by Students

Students were scored according to their responses to how often they experienced nine bullying behaviors on the *Student Bullying* scale. Students bullied **Almost Never** had a score on the scale of at least 9.3, which corresponds to "never" experiencing five of the nine bullying behaviors and experiencing each of the other four behaviors "a few times a year," on average. Students bullied **About Weekly** had a score no higher than 7.3, which corresponds to their experiencing each of five of the nine behaviors "once or twice a month" and each of the other four "a few times a year," on average. All other students were bullied **About Monthly**.

Country	Almost Never		About Monthly		About Weekly		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Chinese Taipei	86 (0.7)	600 (2.4)	13 (0.6)	596 (5.1)	1 (0.2)	~ ~	11.3 (0.04)
Kazakhstan	86 (0.8)	531 (5.4)	13 (0.7)	513 (6.4)	2 (0.2)	~ ~	11.3 (0.05)
Korea, Rep. of	84 (0.6)	607 (2.7)	15 (0.6)	603 (3.9)	1 (0.2)	~ ~	11.1 (0.03)
Georgia	82 (1.0)	459 (3.5)	16 (0.9)	441 (6.0)	2 (0.3)	~ ~	11.0 (0.05)
Japan	80 (0.8)	585 (2.6)	18 (0.7)	596 (3.5)	2 (0.2)	~ ~	10.9 (0.05)
Chile	78 (0.8)	431 (3.3)	18 (0.7)	420 (4.4)	3 (0.4)	401 (8.1)	10.6 (0.04)
Norway (9)	75 (0.9)	514 (2.2)	22 (0.8)	509 (3.5)	3 (0.3)	478 (10.9)	10.6 (0.04)
Ireland	75 (0.9)	526 (2.7)	22 (0.9)	521 (3.6)	4 (0.3)	492 (6.8)	10.5 (0.04)
Sweden	74 (0.9)	504 (2.8)	23 (0.8)	497 (4.3)	3 (0.3)	459 (8.3)	10.5 (0.04)
Italy	73 (0.9)	497 (2.7)	25 (0.8)	488 (3.2)	2 (0.3)	~ ~	10.3 (0.04)
Hungary	73 (1.0)	521 (3.8)	25 (0.9)	502 (5.3)	2 (0.3)	~ ~	10.3 (0.04)
Slovenia	72 (1.1)	518 (2.2)	24 (1.0)	515 (2.7)	4 (0.3)	491 (10.3)	10.3 (0.04)
Lithuania	72 (1.3)	515 (3.1)	24 (1.1)	505 (4.0)	4 (0.4)	491 (8.0)	10.3 (0.06)
Turkey	69 (1.1)	468 (5.2)	26 (0.9)	447 (4.8)	6 (0.3)	397 (7.4)	10.3 (0.05)
Russian Federation	66 (1.0)	541 (4.9)	30 (0.9)	536 (5.1)	4 (0.3)	511 (7.9)	10.1 (0.04)
Canada	65 (0.8)	533 (2.1)	30 (0.7)	525 (2.4)	5 (0.3)	500 (5.0)	10.0 (0.03)
United States	64 (0.6)	522 (3.2)	29 (0.5)	518 (3.4)	7 (0.4)	494 (4.7)	10.0 (0.03)
Saudi Arabia	64 (1.2)	374 (4.4)	27 (1.0)	372 (6.1)	9 (0.6)	328 (7.8)	10.1 (0.06)
Malta	64 (0.9)	500 (1.5)	29 (0.8)	499 (2.2)	7 (0.5)	445 (7.2)	10.0 (0.03)
Jordan	64 (1.1)	400 (3.2)	26 (0.9)	378 (4.3)	11 (0.5)	342 (6.4)	10.1 (0.05)
England	62 (1.2)	524 (4.2)	32 (1.0)	516 (4.9)	6 (0.5)	496 (7.4)	9.9 (0.05)
Qatar	61 (1.0)	449 (2.8)	27 (0.7)	443 (3.9)	12 (0.8)	383 (7.5)	9.8 (0.05)
Iran, Islamic Rep. of	60 (0.8)	445 (4.7)	32 (0.8)	432 (5.5)	8 (0.5)	389 (6.4)	9.9 (0.04)
Kuwait	60 (1.1)	397 (4.7)	32 (1.0)	390 (6.0)	8 (0.6)	370 (9.6)	9.8 (0.05)
United Arab Emirates	58 (0.8)	477 (2.1)	32 (0.6)	461 (2.4)	10 (0.5)	414 (4.8)	9.7 (0.04)
Singapore	58 (0.8)	628 (3.0)	36 (0.7)	615 (3.8)	6 (0.4)	591 (7.1)	9.7 (0.03)
Australia	57 (1.0)	514 (3.2)	34 (0.8)	500 (3.2)	9 (0.4)	476 (5.1)	9.7 (0.04)
Hong Kong SAR	56 (1.1)	590 (4.4)	37 (1.0)	601 (5.4)	7 (0.6)	593 (8.4)	9.6 (0.04)
New Zealand	55 (1.0)	501 (3.9)	35 (0.8)	492 (3.6)	10 (0.5)	466 (4.9)	9.5 (0.04)
Egypt	55 (1.5)	418 (4.1)	29 (1.0)	381 (4.8)	16 (1.0)	335 (5.6)	9.7 (0.07)
Lebanon	52 (2.0)	456 (4.0)	28 (1.3)	446 (4.2)	19 (1.8)	412 (6.9)	9.5 (0.10)
Morocco	51 (0.8)	391 (2.6)	38 (0.7)	384 (2.4)	11 (0.5)	370 (3.8)	9.4 (0.04)
Bahrain	49 (0.8)	466 (2.0)	36 (0.7)	455 (2.3)	15 (0.6)	424 (3.4)	9.3 (0.04)
Malaysia	48 (1.1)	478 (3.6)	42 (0.7)	462 (3.5)	11 (0.8)	425 (5.5)	9.3 (0.05)
Oman	44 (0.9)	416 (2.5)	41 (0.8)	402 (3.1)	14 (0.7)	373 (5.3)	9.2 (0.04)
South Africa (9)	36 (1.2)	396 (5.5)	47 (0.9)	374 (4.2)	17 (0.9)	328 (5.4)	8.9 (0.04)
Thailand	33 (1.1)	435 (5.7)	50 (0.9)	435 (5.0)	17 (0.8)	415 (5.6)	8.8 (0.04)
Botswana (9)	26 (0.8)	408 (2.7)	51 (0.7)	400 (2.1)	23 (0.6)	368 (4.3)	8.4 (0.03)
Israel	- -	- -	- -	- -	- -	- -	- -
International Avg.	63 (0.2)	488 (0.6)	29 (0.1)	478 (0.7)	8 (0.1)	434 (1.2)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 7.6: Student Bullying (Continued)

Country	Almost Never		About Monthly		About Weekly		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Norway (8)	81 (0.8)	490 (1.9)	17 (0.7)	481 (3.3)	2 (0.3)	~ ~	10.9 (0.04)
Buenos Aires, Argentina	75 (1.2)	399 (4.7)	22 (1.1)	389 (6.1)	3 (0.4)	373 (11.2)	10.5 (0.05)
Quebec, Canada	74 (0.9)	547 (3.2)	24 (0.9)	541 (4.4)	3 (0.3)	531 (7.3)	10.4 (0.04)
Florida, US	68 (1.2)	497 (6.8)	26 (1.0)	497 (6.9)	6 (0.6)	461 (13.2)	10.2 (0.06)
Dubai, UAE	62 (1.1)	518 (2.4)	30 (0.9)	510 (3.2)	8 (0.7)	468 (6.1)	9.9 (0.05)
Ontario, Canada	61 (1.0)	527 (2.9)	32 (0.9)	523 (2.8)	7 (0.4)	495 (6.2)	9.9 (0.04)
Abu Dhabi, UAE	56 (1.5)	456 (4.5)	31 (1.0)	439 (5.2)	13 (1.0)	388 (7.7)	9.7 (0.07)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

During this school year, how often have other students from your school done any of the following things to you (including through texting or the Internet)?

	Never	A few times a year	Once or twice a month	At least once a week
1) Made fun of me or called me names	○	○	○	○
2) Left me out of their games or activities	○	○	○	○
3) Spread lies about me	○	○	○	○
4) Stole something from me	○	○	○	○
5) Hit or hurt me (*e.g., shoving, hitting, kicking*)	○	○	○	○
6) Made me do things I didn't want to do	○	○	○	○
7) Shared embarrassing information about me	○	○	○	○
8) Posted embarrassing things about me online	○	○	○	○
9) Threatened me	○	○	○	○

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TIMSS 2015

CHAPTER 8: TEACHERS' AND PRINCIPALS' PREPARATION

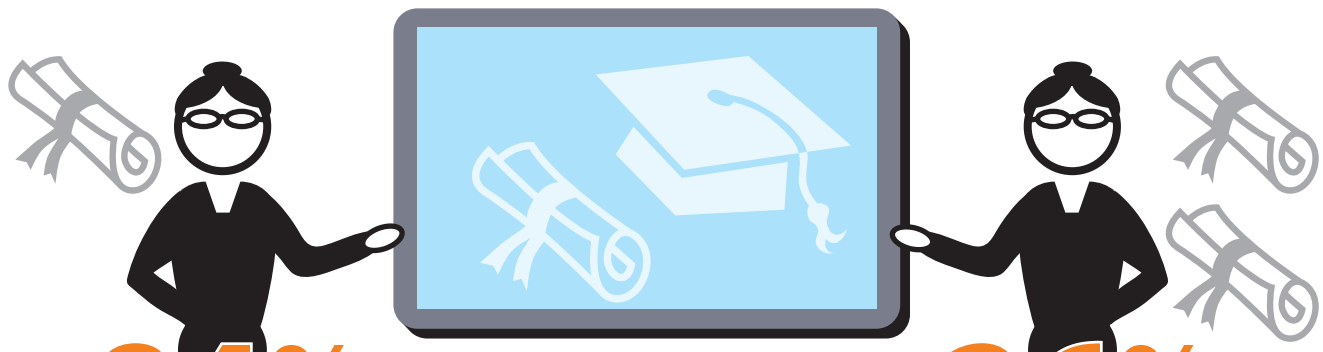
TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Students Have Well Qualified Teachers and Principals

Mathematics Teachers' Preparation and Experience

Internationally, teachers of fourth grade students reported high levels of education and considerable experience.

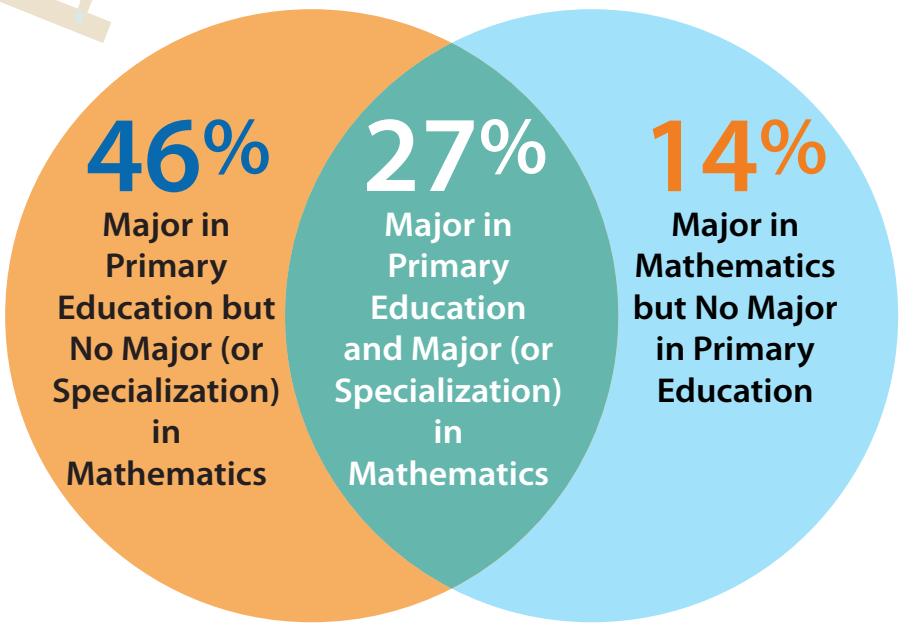


84% of students were taught by teachers with at least a Bachelor's degree

26% of students were taught by teachers with an advanced degree

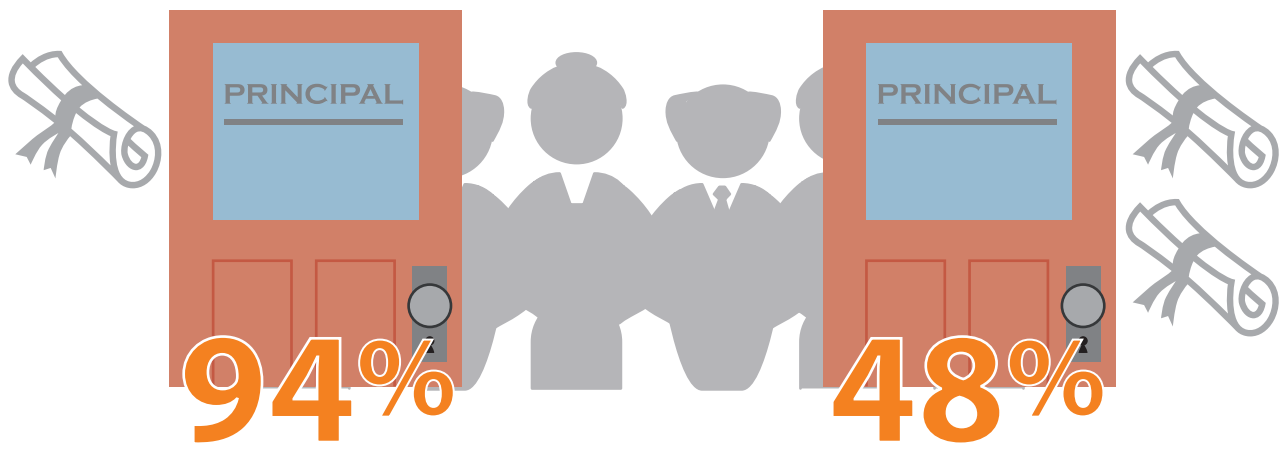
40% of students were taught by teachers with at least 20 years of experience (on average, students' teachers had 17 years of experience).

Most students (73%) had teachers that majored in primary education and 41% had teachers that majored in mathematics or had a specialization in mathematics.



Principals' Preparation and Experience

Internationally, principals of fourth grade students reported high levels of education and considerable experience.



94% of students had principals with at least a Bachelor's degree

48% of students had principals with an advanced degree

On average, principals had 10 years of experience. They were required to have teaching experience in 40 countries, but completion of a specialized leadership program was less common (21 countries).

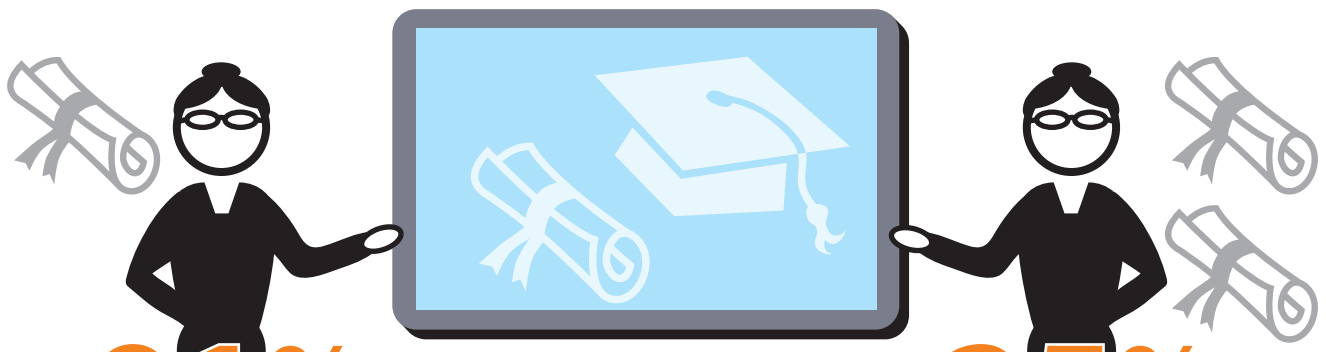
SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Students Have Well Qualified Teachers and Principals

Mathematics Teachers' Preparation and Experience

Internationally, teachers of eighth grade students reported high levels of education and considerable experience.

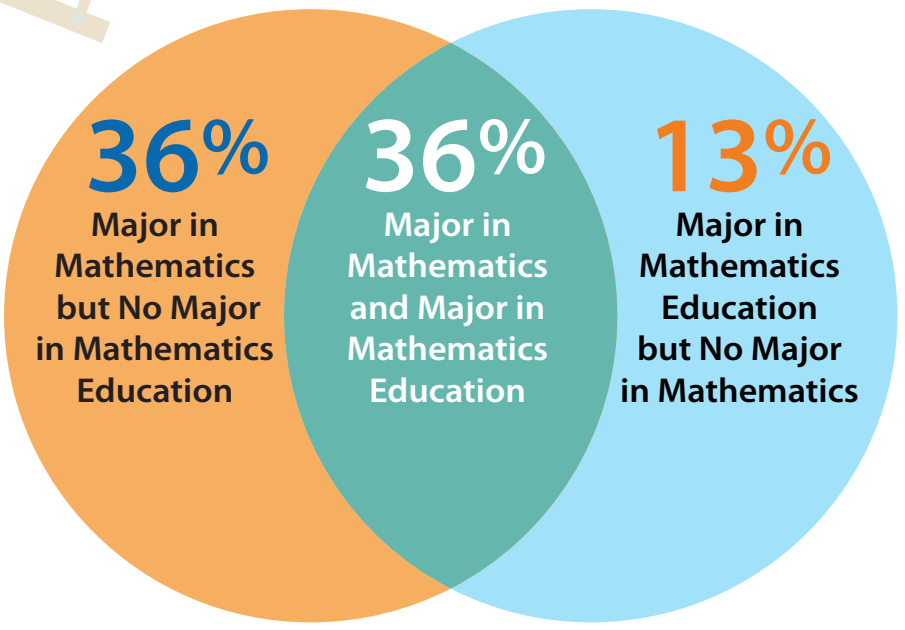


91% of students were taught by teachers with at least a Bachelor's degree

25% of students were taught by teachers with an advanced degree

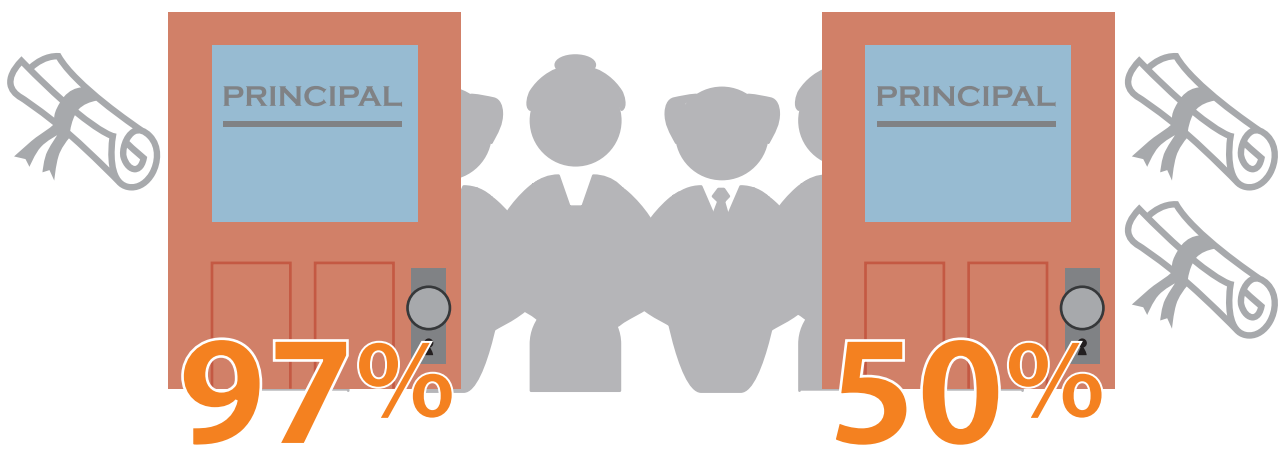
34% of students were taught by teachers with at least 20 years of experience (on average, students' teachers had 16 years of experience).

Most students (72%) had teachers that majored in mathematics and 49% had teachers that majored in mathematics education.



Principals' Preparation and Experience

Internationally, principals of eighth grade students reported high levels of education and considerable experience.



97% of students had principals with at least a Bachelor's degree

50% of students had principals with an advanced degree

On average, principals had 9 years of experience. They were required to have teaching experience in 31 countries, but completion of a specialized leadership program was less common (22 countries).

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Exhibit 8.1: Teachers' Formal Education*

Reported by Teachers

Country		Percent of Students by Teacher Educational Level			
		Completed Postgraduate University Degree**	Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree	Completed Post-Secondary Education but Not a Bachelor's Degree	No Further than Upper-Secondary Education
Australia		12 (2.6)	81 (3.2)	7 (1.9)	0 (0.0)
Bahrain		12 (3.0)	87 (3.1)	1 (0.5)	0 (0.4)
Belgium (Flemish)		1 (0.7)	98 (0.8)	1 (0.4)	0 (0.0)
Bulgaria		74 (3.4)	17 (2.5)	10 (2.2)	0 (0.0)
Canada		14 (2.0)	86 (2.0)	0 (0.0)	0 (0.0)
Chile		10 (2.7)	82 (3.6)	8 (2.3)	0 (0.0)
Chinese Taipei		39 (4.0)	61 (4.0)	0 (0.3)	0 (0.0)
Croatia		0 (0.4)	41 (3.5)	58 (3.5)	0 (0.0)
Cyprus		61 (3.6)	37 (3.6)	1 (0.7)	0 (0.0)
Czech Republic		94 (1.6)	2 (1.0)	0 (0.2)	4 (1.2)
Denmark		4 (1.5)	87 (2.8)	3 (1.4)	7 (2.0)
England		13 (2.9)	86 (3.0)	1 (0.7)	0 (0.0)
Finland		90 (1.8)	9 (1.7)	0 (0.1)	1 (0.6)
France		40 (3.7)	48 (3.8)	9 (2.3)	3 (1.2)
Georgia		85 (3.3)	12 (3.0)	3 (1.4)	0 (0.0)
Germany		85 (1.8)	0 (0.0)	15 (1.8)	0 (0.0)
Hong Kong SAR		30 (3.8)	66 (4.4)	4 (1.8)	0 (0.0)
Hungary		1 (0.3)	99 (0.5)	0 (0.4)	0 (0.0)
Indonesia		2 (0.7)	85 (2.2)	5 (1.3)	8 (2.0)
Iran, Islamic Rep. of		7 (1.5)	55 (3.8)	28 (3.7)	10 (2.3)
Ireland		13 (2.3)	84 (2.7)	3 (1.2)	1 (0.5)
Italy		3 (1.4)	16 (3.4)	13 (2.6)	68 (3.6)
Japan		4 (1.1)	90 (2.2)	7 (1.8)	0 (0.0)
Jordan		7 (2.0)	72 (3.9)	16 (3.3)	5 (1.8)
Kazakhstan		1 (0.6)	78 (3.5)	14 (2.8)	8 (2.5)
Korea, Rep. of		21 (3.2)	72 (3.4)	6 (2.0)	0 (0.0)
Kuwait	r	12 (2.7)	68 (3.8)	17 (2.8)	3 (1.2)
Lithuania		21 (3.6)	74 (3.5)	5 (1.4)	0 (0.0)
Morocco	r	1 (0.6)	28 (3.7)	3 (1.2)	67 (3.7)
Netherlands	r	4 (2.0)	70 (4.2)	25 (4.0)	2 (0.3)
New Zealand		27 (2.3)	58 (2.6)	15 (2.0)	0 (0.0)
Northern Ireland	r	16 (3.3)	83 (3.4)	0 (0.0)	2 (0.9)
Norway (5)		8 (2.7)	88 (3.0)	4 (1.4)	0 (0.0)
Oman	r	29 (2.9)	66 (3.2)	3 (1.2)	2 (1.0)
Poland		97 (1.3)	3 (1.3)	0 (0.0)	0 (0.0)
Portugal		7 (1.8)	89 (2.3)	4 (1.3)	0 (0.0)
Qatar	r	15 (2.3)	79 (2.5)	4 (1.4)	2 (1.4)
Russian Federation		30 (4.5)	53 (4.3)	17 (2.8)	0 (0.0)
Saudi Arabia	s	8 (2.0)	67 (4.2)	9 (2.6)	17 (3.5)
Serbia		12 (2.6)	39 (4.1)	48 (4.3)	1 (0.5)
Singapore		10 (1.6)	69 (2.6)	20 (2.1)	1 (0.6)
Slovak Republic		100 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Slovenia		59 (3.2)	0 (0.4)	41 (3.2)	0 (0.0)
South Africa (5)		1 (0.5)	46 (3.4)	49 (3.4)	4 (1.0)
Spain	r	4 (1.5)	33 (4.0)	61 (4.2)	2 (1.0)
Sweden		11 (2.7)	76 (3.7)	9 (2.7)	4 (1.8)
Turkey		3 (1.1)	81 (2.6)	16 (2.5)	0 (0.0)
United Arab Emirates	r	32 (2.7)	61 (2.6)	6 (1.3)	1 (0.3)
United States		53 (2.4)	47 (2.4)	0 (0.0)	0 (0.0)
International Avg.		26 (0.3)	58 (0.4)	12 (0.3)	5 (0.2)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

* Based on countries' categorizations according to UNESCO's International Standard Classification of Education (Operational Manual for ISCED-2011).

** For example, doctorate, master's, or other postgraduate degree.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for less than 50% of students.

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Exhibit 8.1: Teachers' Formal Education* (Continued)

Country		Percent of Students by Teacher Educational Level			
		Completed Postgraduate University Degree**	Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree	Completed Post-Secondary Education but Not a Bachelor's Degree	No Further than Upper-Secondary Education
Benchmarking Participants					
Buenos Aires, Argentina		x x	x x	x x	x x
Ontario, Canada		17 (3.6)	83 (3.6)	0 (0.0)	0 (0.0)
Quebec, Canada		7 (2.3)	93 (2.3)	0 (0.0)	0 (0.0)
Norway (4)		4 (1.3)	84 (3.4)	10 (3.2)	1 (0.7)
Abu Dhabi, UAE	r	39 (4.6)	53 (4.2)	7 (2.7)	1 (0.6)
Dubai, UAE	r	38 (3.7)	58 (3.8)	4 (0.9)	0 (0.0)
Florida, US	r	47 (6.5)	53 (6.5)	0 (0.0)	0 (0.0)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.2: Teachers' Formal Education*

Reported by Teachers

Country		Percent of Students by Teacher Educational Level			
		Completed Postgraduate University Degree**	Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree	Completed Post-Secondary Education but Not a Bachelor's Degree	No Further than Upper-Secondary Education
Australia		20 (2.7)	80 (2.7)	0 (0.0)	0 (0.0)
Bahrain		18 (4.0)	74 (4.6)	7 (2.0)	1 (1.0)
Botswana (9)	s	1 (0.9)	34 (5.6)	61 (5.6)	4 (2.0)
Canada		17 (2.6)	82 (2.7)	1 (0.6)	0 (0.0)
Chile	r	7 (2.4)	86 (3.0)	5 (1.6)	2 (1.8)
Chinese Taipei		51 (3.9)	49 (3.9)	0 (0.0)	0 (0.0)
Egypt	r	0 (0.2)	87 (2.9)	11 (2.8)	2 (1.1)
England		17 (3.0)	82 (3.1)	0 (0.4)	1 (0.5)
Georgia		88 (2.9)	10 (2.7)	0 (0.0)	2 (1.2)
Hong Kong SAR		43 (4.6)	53 (4.8)	3 (0.8)	1 (0.8)
Hungary		30 (3.2)	70 (3.2)	0 (0.3)	0 (0.0)
Iran, Islamic Rep. of		12 (2.4)	65 (3.4)	21 (2.7)	2 (1.1)
Ireland		32 (2.7)	66 (2.7)	0 (0.2)	1 (0.5)
Israel		37 (3.0)	59 (3.2)	3 (1.0)	0 (0.2)
Italy		11 (2.9)	71 (4.1)	18 (3.2)	0 (0.0)
Japan		9 (2.2)	90 (2.3)	1 (0.4)	0 (0.0)
Jordan	r	9 (2.9)	80 (3.6)	6 (2.1)	4 (1.6)
Kazakhstan		4 (1.5)	93 (2.1)	0 (0.4)	2 (1.2)
Korea, Rep. of		34 (3.5)	66 (3.5)	0 (0.0)	0 (0.0)
Kuwait	r	14 (3.9)	76 (4.1)	8 (1.4)	2 (1.1)
Lebanon		41 (4.4)	39 (4.1)	1 (0.7)	20 (3.5)
Lithuania		33 (3.4)	67 (3.3)	0 (0.2)	0 (0.2)
Malaysia		3 (1.2)	92 (2.0)	5 (1.4)	0 (0.0)
Malta		13 (0.1)	80 (0.1)	6 (0.1)	1 (0.0)
Morocco	r	5 (1.6)	32 (3.3)	22 (2.8)	41 (3.0)
New Zealand		46 (2.9)	44 (3.4)	9 (2.1)	0 (0.0)
Norway (9)		22 (3.6)	74 (3.5)	5 (1.7)	0 (0.0)
Oman		13 (1.5)	86 (1.6)	1 (0.6)	1 (0.3)
Qatar		30 (3.2)	66 (3.2)	2 (0.5)	1 (0.4)
Russian Federation		64 (3.9)	36 (3.9)	0 (0.4)	0 (0.0)
Saudi Arabia	s	3 (2.0)	88 (3.6)	5 (2.3)	4 (2.1)
Singapore		11 (1.6)	87 (1.8)	2 (0.8)	0 (0.0)
Slovenia		60 (3.5)	0 (0.2)	40 (3.5)	0 (0.0)
South Africa (9)		2 (0.7)	71 (2.8)	25 (2.8)	2 (0.9)
Sweden		35 (3.8)	59 (4.0)	4 (1.7)	1 (0.8)
Thailand		26 (3.1)	74 (3.1)	0 (0.0)	0 (0.0)
Turkey		7 (2.0)	90 (2.2)	3 (1.5)	0 (0.0)
United Arab Emirates	r	30 (2.2)	66 (2.7)	4 (1.2)	1 (0.3)
United States		58 (2.7)	42 (2.7)	0 (0.0)	0 (0.0)
International Avg.		25 (0.5)	66 (0.5)	7 (0.3)	2 (0.2)
Benchmarking Participants					
Buenos Aires, Argentina		x x	x x	x x	x x
Ontario, Canada	r	18 (3.6)	80 (3.7)	1 (1.1)	0 (0.0)
Quebec, Canada		15 (4.4)	85 (4.4)	0 (0.0)	0 (0.0)
Norway (8)		23 (2.8)	74 (3.2)	3 (1.2)	0 (0.0)
Abu Dhabi, UAE	r	16 (3.6)	79 (4.0)	5 (2.1)	0 (0.5)
Dubai, UAE	r	42 (2.3)	56 (2.5)	1 (0.4)	1 (0.9)
Florida, US	r	35 (5.6)	65 (5.6)	0 (0.0)	0 (0.0)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

* Based on countries' categorizations according to UNESCO's International Standard Classification of Education (Operational Manual for ISCED-2011).

** For example, doctorate, master's, or other postgraduate degree.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.
An "x" indicates data are available for less than 50% of students.

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Exhibit 8.3: Teachers Majored in Education and Mathematics

Reported by Teachers

Country		Major in Primary Education and Major (or Specialization) in Mathematics		Major in Primary Education but No Major (or Specialization) in Mathematics		Major in Mathematics but No Major in Primary Education		All Other Majors		No Formal Education Beyond Upper-Secondary*	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia		13 (2.6)	536 (7.1)	80 (3.2)	514 (3.8)	1 (0.6)	~ ~	6 (1.5)	531 (8.7)	0 (0.0)	~ ~
Bahrain		30 (1.7)	451 (3.0)	4 (1.4)	516 (24.2)	59 (2.8)	449 (1.9)	7 (3.3)	439 (22.3)	0 (0.3)	~ ~
Belgium (Flemish)		- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Bulgaria	r	27 (3.9)	540 (11.4)	70 (4.0)	516 (5.6)	1 (0.3)	~ ~	2 (1.2)	~ ~	0 (0.0)	~ ~
Canada		6 (1.0)	495 (11.1)	79 (2.1)	513 (2.6)	3 (0.9)	518 (10.7)	12 (1.6)	501 (5.0)	0 (0.0)	~ ~
Chile	r	46 (5.2)	463 (4.8)	51 (5.3)	466 (5.1)	2 (1.4)	~ ~	1 (0.6)	~ ~	1 (0.0)	~ ~
Chinese Taipei		37 (3.8)	599 (2.8)	44 (3.6)	594 (3.0)	3 (1.4)	602 (14.6)	15 (2.7)	599 (5.0)	0 (0.0)	~ ~
Croatia		- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Cyprus		22 (3.0)	527 (5.3)	75 (3.0)	521 (2.8)	1 (0.7)	~ ~	2 (0.9)	~ ~	0 (0.0)	~ ~
Czech Republic		6 (1.4)	526 (8.3)	75 (2.7)	529 (2.8)	3 (1.4)	521 (13.7)	13 (2.0)	531 (5.3)	4 (1.2)	507 (12.6)
Denmark	r	38 (3.6)	534 (4.0)	12 (2.8)	527 (10.3)	30 (3.7)	536 (5.7)	13 (2.6)	548 (10.2)	7 (2.1)	551 (10.8)
England		12 (2.6)	548 (11.9)	57 (4.3)	543 (4.7)	4 (1.7)	582 (23.5)	27 (3.8)	552 (8.7)	0 (0.0)	~ ~
Finland		10 (2.1)	538 (6.6)	82 (2.8)	536 (2.0)	0 (0.4)	~ ~	7 (1.7)	521 (9.3)	1 (0.6)	~ ~
France	s	10 (2.4)	484 (7.1)	28 (4.0)	492 (6.6)	20 (3.6)	485 (8.8)	38 (4.4)	481 (5.4)	4 (1.5)	489 (6.3)
Georgia		64 (4.2)	464 (5.5)	11 (3.0)	475 (7.3)	18 (3.5)	465 (9.8)	8 (2.2)	457 (12.5)	0 (0.0)	~ ~
Germany		62 (3.4)	523 (2.6)	30 (3.0)	526 (3.8)	4 (1.2)	511 (12.5)	4 (1.4)	494 (10.7)	0 (0.0)	~ ~
Hong Kong SAR		64 (4.3)	611 (3.3)	23 (3.8)	620 (8.0)	10 (2.9)	621 (14.4)	3 (1.4)	597 (14.4)	0 (0.0)	~ ~
Hungary	r	5 (2.2)	563 (12.5)	94 (2.3)	528 (3.7)	1 (0.6)	~ ~	0 (0.0)	~ ~	0 (0.0)	~ ~
Indonesia		24 (3.0)	389 (9.3)	42 (3.5)	402 (6.0)	9 (2.3)	413 (15.0)	17 (2.5)	405 (9.3)	8 (2.1)	373 (11.3)
Iran, Islamic Rep. of		15 (2.7)	432 (13.2)	43 (3.5)	434 (7.1)	6 (1.5)	447 (28.7)	27 (3.0)	436 (6.0)	9 (2.3)	413 (19.3)
Ireland		12 (2.6)	547 (4.8)	78 (3.6)	545 (2.7)	3 (2.0)	556 (5.9)	6 (2.1)	560 (5.2)	1 (0.6)	~ ~
Italy	r	2 (0.7)	~ ~	6 (2.0)	511 (9.5)	3 (1.4)	490 (23.8)	16 (3.2)	507 (7.6)	73 (3.7)	505 (3.1)
Japan		17 (2.8)	590 (3.1)	73 (3.1)	595 (2.5)	2 (1.2)	~ ~	7 (2.0)	594 (7.3)	0 (0.0)	~ ~
Jordan		10 (2.3)	378 (13.1)	1 (0.7)	~ ~	77 (3.7)	390 (4.2)	6 (2.3)	398 (10.0)	5 (1.9)	333 (16.8)
Kazakhstan		54 (4.0)	548 (5.5)	33 (3.6)	552 (10.9)	3 (1.4)	541 (41.4)	2 (0.9)	~ ~	8 (2.6)	531 (10.1)
Korea, Rep. of		12 (2.7)	609 (6.7)	86 (2.9)	608 (2.3)	0 (0.0)	~ ~	2 (1.1)	~ ~	0 (0.0)	~ ~
Kuwait		41 (4.3)	348 (7.3)	2 (0.8)	~ ~	48 (4.6)	350 (7.9)	7 (2.0)	374 (21.1)	3 (1.1)	346 (27.6)
Lithuania		18 (2.8)	526 (5.9)	79 (2.9)	539 (3.0)	1 (0.6)	~ ~	2 (0.7)	~ ~	0 (0.0)	~ ~
Morocco	r	3 (1.2)	383 (16.1)	5 (1.4)	365 (21.0)	9 (2.0)	416 (14.4)	21 (3.4)	374 (10.1)	63 (3.8)	372 (4.8)
Netherlands		x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
New Zealand		19 (2.1)	499 (6.8)	75 (2.5)	490 (3.0)	0 (0.3)	~ ~	6 (1.3)	503 (12.6)	0 (0.0)	~ ~
Northern Ireland	r	17 (4.0)	581 (11.2)	65 (4.7)	572 (4.2)	1 (1.0)	~ ~	16 (3.7)	567 (5.6)	2 (0.9)	~ ~
Norway (5)		47 (4.3)	552 (3.7)	44 (4.2)	548 (3.6)	4 (1.8)	553 (9.6)	5 (1.5)	552 (7.2)	0 (0.0)	~ ~
Oman		64 (3.0)	432 (3.3)	10 (1.8)	414 (8.7)	23 (2.4)	413 (5.9)	2 (1.0)	~ ~	1 (0.9)	~ ~
Poland		7 (1.8)	544 (8.0)	0 (0.0)	~ ~	93 (1.8)	534 (2.4)	0 (0.0)	~ ~	0 (0.0)	~ ~
Portugal		29 (2.9)	534 (5.4)	70 (2.9)	544 (2.8)	0 (0.0)	~ ~	1 (0.7)	~ ~	0 (0.0)	~ ~
Qatar		28 (2.7)	433 (6.1)	11 (2.4)	508 (14.0)	45 (2.8)	421 (5.2)	13 (2.2)	440 (10.0)	2 (1.3)	~ ~
Russian Federation		44 (4.6)	565 (4.8)	53 (5.0)	564 (5.7)	1 (0.7)	~ ~	2 (0.9)	~ ~	0 (0.0)	~ ~
Saudi Arabia		34 (3.7)	380 (7.0)	4 (1.7)	373 (39.4)	45 (3.9)	384 (6.7)	5 (1.6)	411 (16.1)	12 (2.6)	373 (12.4)
Serbia		25 (3.8)	532 (5.5)	70 (3.6)	513 (4.8)	1 (0.9)	~ ~	2 (1.3)	~ ~	1 (0.6)	~ ~
Singapore		59 (2.9)	621 (5.2)	14 (1.9)	629 (7.7)	14 (1.8)	611 (10.6)	11 (1.7)	598 (10.5)	1 (0.7)	~ ~
Slovak Republic		23 (2.9)	502 (4.8)	70 (3.0)	499 (3.4)	3 (1.0)	453 (32.2)	4 (1.3)	481 (22.6)	0 (0.0)	~ ~
Slovenia		5 (1.2)	520 (4.9)	94 (1.3)	521 (2.0)	0 (0.0)	~ ~	0 (0.3)	~ ~	0 (0.0)	~ ~
South Africa (5)		47 (3.8)	382 (7.5)	30 (3.3)	370 (10.1)	11 (2.3)	374 (10.3)	9 (2.1)	376 (17.1)	4 (1.1)	343 (20.3)
Spain		22 (2.5)	508 (4.5)	62 (3.5)	504 (3.4)	4 (1.6)	499 (16.5)	10 (2.3)	505 (7.6)	1 (0.9)	~ ~
Sweden		70 (4.1)	521 (3.6)	12 (2.8)	516 (9.0)	12 (3.2)	523 (8.1)	2 (0.9)	~ ~	4 (1.7)	506 (12.7)
Turkey	r	17 (2.1)	495 (8.2)	68 (3.4)	484 (4.2)	2 (1.0)	~ ~	13 (2.8)	482 (10.1)	0 (0.0)	~ ~
United Arab Emirates		25 (1.8)	448 (7.1)	16 (1.5)	449 (9.2)	50 (2.1)	453 (3.8)	8 (1.2)	483 (9.7)	0 (0.3)	~ ~
United States		13 (1.6)	537 (6.6)	73 (2.3)	540 (2.8)	2 (0.7)	~ ~	12 (1.5)	541 (9.5)	0 (0.0)	~ ~
International Avg.		27 (0.4)	505 (1.1)	46 (0.5)	512 (1.5)	14 (0.3)	487 (2.9)	8 (0.3)	495 (2.0)	5 (0.2)	434 (4.0)

* Countries have been increasing their certification requirements and providing professional development to teachers certified under earlier guidelines.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.3: Teachers Majored in Education and Mathematics (Continued)

Country		Major in Primary Education and Major (or Specialization) in Mathematics		Major in Primary Education but No Major (or Specialization) in Mathematics		Major in Mathematics but No Major in Primary Education		All Other Majors		No Formal Education Beyond Upper-Secondary*	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Benchmarking Participants											
Buenos Aires, Argentina		x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
Ontario, Canada	r	5 (1.5)	510 (9.0)	76 (3.0)	516 (2.8)	1 (0.5)	~ ~	18 (2.7)	506 (6.2)	0 (0.0)	~ ~
Quebec, Canada		6 (2.1)	519 (8.9)	86 (3.9)	537 (4.4)	5 (2.9)	531 (15.8)	3 (1.5)	530 (8.8)	0 (0.0)	~ ~
Norway (4)		44 (4.4)	497 (3.6)	42 (4.5)	497 (3.0)	2 (1.2)	~ ~	11 (2.6)	487 (11.4)	1 (0.8)	~ ~
Abu Dhabi, UAE	r	29 (4.0)	407 (15.4)	29 (3.9)	391 (12.8)	33 (4.7)	449 (8.9)	9 (2.5)	472 (22.5)	1 (0.6)	~ ~
Dubai, UAE		30 (2.7)	511 (4.0)	17 (1.3)	556 (4.3)	42 (3.0)	487 (3.7)	11 (2.0)	531 (10.0)	0 (0.0)	~ ~
Florida, US	r	11 (3.5)	566 (12.9)	68 (3.8)	549 (5.6)	4 (2.5)	536 (25.1)	16 (3.6)	535 (18.6)	0 (0.0)	~ ~

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.4: Teachers Majored in Education and Mathematics

Reported by Teachers

Country	Major in Mathematics and Mathematics Education		Major in Mathematics but No Major in Mathematics Education		Major in Mathematics Education but No Major in Mathematics		All Other Majors		No Formal Education Beyond Upper-Secondary*	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	46 (3.3)	513 (4.7)	18 (2.7)	507 (10.3)	14 (2.7)	498 (9.8)	22 (2.7)	503 (6.0)	0 (0.0)	~ ~
Bahrain	33 (4.2)	460 (4.1)	48 (4.5)	452 (3.3)	16 (2.2)	440 (5.6)	3 (0.6)	469 (15.9)	1 (0.9)	~ ~
Botswana (9)	22 (4.0)	395 (6.4)	46 (5.2)	392 (4.4)	14 (3.2)	383 (6.3)	16 (3.6)	398 (6.8)	2 (1.3)	~ ~
Canada	19 (2.2)	545 (6.0)	8 (1.6)	537 (5.6)	15 (2.3)	546 (4.8)	59 (2.5)	521 (2.9)	0 (0.0)	~ ~
Chile	44 (4.7)	444 (6.2)	34 (4.2)	425 (7.1)	5 (2.0)	440 (15.8)	14 (3.4)	399 (8.9)	2 (1.7)	~ ~
Chinese Taipei	31 (3.1)	610 (5.8)	50 (3.8)	600 (4.6)	4 (1.5)	599 (16.9)	15 (2.3)	577 (4.8)	0 (0.0)	~ ~
Egypt	46 (4.4)	392 (6.1)	25 (3.5)	397 (8.5)	22 (3.2)	395 (9.3)	5 (1.5)	362 (16.7)	2 (0.9)	~ ~
England	44 (4.1)	520 (8.1)	37 (4.3)	526 (8.5)	4 (1.5)	475 (26.2)	15 (3.0)	504 (12.6)	1 (0.5)	~ ~
Georgia	46 (4.1)	453 (6.0)	45 (3.8)	458 (4.5)	4 (1.7)	439 (13.4)	3 (1.3)	435 (26.2)	2 (1.2)	~ ~
Hong Kong SAR	42 (4.1)	574 (8.2)	25 (3.5)	610 (8.2)	9 (2.3)	597 (16.3)	23 (3.9)	610 (8.2)	1 (0.8)	~ ~
Hungary	12 (2.4)	500 (14.4)	8 (2.3)	519 (18.2)	76 (3.3)	518 (4.3)	4 (1.3)	472 (17.2)	0 (0.0)	~ ~
Iran, Islamic Rep. of	21 (2.1)	440 (10.0)	46 (3.6)	441 (7.0)	22 (2.9)	445 (9.2)	9 (2.2)	407 (13.3)	2 (1.1)	~ ~
Ireland	33 (3.0)	519 (5.1)	36 (2.6)	532 (5.6)	8 (1.6)	534 (5.7)	22 (2.5)	510 (8.3)	1 (0.5)	~ ~
Israel	62 (2.6)	519 (5.9)	25 (2.2)	498 (6.7)	7 (1.7)	511 (14.2)	5 (1.0)	474 (18.2)	0 (0.2)	~ ~
Italy	25 (3.6)	494 (6.3)	20 (3.0)	495 (7.1)	9 (2.3)	491 (9.6)	46 (4.0)	492 (4.5)	0 (0.0)	~ ~
Japan	41 (3.5)	582 (3.9)	40 (3.2)	593 (3.5)	6 (1.8)	562 (10.9)	13 (2.0)	592 (6.9)	0 (0.0)	~ ~
Jordan	12 (2.5)	385 (9.2)	75 (3.3)	384 (3.9)	6 (1.7)	389 (14.0)	4 (1.3)	402 (16.2)	3 (1.2)	406 (11.1)
Kazakhstan	37 (3.8)	540 (8.4)	58 (3.8)	524 (7.9)	1 (0.8)	~ ~	1 (1.0)	~ ~	2 (1.2)	~ ~
Korea, Rep. of	18 (3.1)	610 (6.2)	30 (3.4)	606 (5.7)	49 (4.1)	603 (3.7)	3 (1.2)	618 (9.4)	0 (0.0)	~ ~
Kuwait	38 (4.5)	407 (9.0)	38 (3.9)	387 (5.4)	16 (2.9)	377 (12.1)	7 (2.2)	411 (37.2)	1 (0.9)	~ ~
Lebanon	20 (3.5)	426 (9.6)	46 (4.1)	451 (5.7)	3 (1.5)	470 (23.0)	11 (2.8)	442 (9.8)	20 (3.6)	431 (8.5)
Lithuania	55 (5.1)	512 (4.9)	36 (4.7)	508 (5.5)	8 (2.5)	508 (13.0)	1 (0.9)	~ ~	0 (0.2)	~ ~
Malaysia	31 (3.3)	466 (8.6)	27 (3.3)	478 (10.0)	18 (2.6)	477 (9.8)	24 (3.3)	449 (9.1)	0 (0.0)	~ ~
Malta	66 (0.1)	494 (1.2)	21 (0.1)	492 (2.2)	8 (0.1)	489 (4.2)	4 (0.0)	506 (7.7)	1 (0.0)	~ ~
Morocco	10 (2.1)	393 (8.0)	43 (3.3)	381 (3.9)	1 (0.5)	~ ~	9 (1.7)	375 (7.2)	37 (2.9)	388 (3.0)
New Zealand	29 (2.9)	496 (8.0)	30 (3.1)	503 (8.9)	7 (1.6)	502 (13.5)	34 (3.7)	481 (6.1)	0 (0.0)	~ ~
Norway (9)	15 (2.5)	512 (5.3)	54 (4.0)	515 (2.9)	2 (1.2)	~ ~	29 (3.5)	512 (3.5)	0 (0.0)	~ ~
Oman	40 (3.4)	398 (5.6)	42 (2.9)	406 (3.7)	17 (2.6)	409 (6.2)	0 (0.1)	~ ~	0 (0.3)	~ ~
Qatar	35 (2.9)	434 (6.1)	50 (3.3)	434 (5.0)	7 (1.7)	452 (16.7)	7 (1.4)	446 (15.8)	1 (0.3)	~ ~
Russian Federation	58 (4.0)	544 (4.5)	41 (3.9)	530 (6.8)	0 (0.0)	~ ~	1 (0.6)	~ ~	0 (0.0)	~ ~
Saudi Arabia	37 (4.3)	366 (7.7)	42 (4.4)	367 (6.8)	16 (2.9)	366 (7.4)	1 (1.0)	~ ~	3 (1.5)	360 (9.6)
Singapore	53 (2.6)	625 (5.2)	31 (2.4)	614 (7.0)	6 (1.1)	645 (11.1)	10 (1.5)	595 (11.4)	0 (0.0)	~ ~
Slovenia	39 (3.2)	511 (2.9)	40 (3.3)	518 (3.2)	20 (2.7)	527 (5.7)	1 (0.5)	~ ~	0 (0.0)	~ ~
South Africa (9)	24 (2.6)	379 (6.5)	48 (3.4)	363 (7.8)	13 (2.3)	396 (17.1)	11 (2.3)	369 (12.6)	2 (0.9)	~ ~
Sweden	50 (4.3)	506 (4.1)	17 (3.3)	495 (8.5)	21 (3.7)	497 (4.9)	11 (2.9)	489 (8.8)	1 (0.8)	~ ~
Thailand	34 (4.0)	419 (7.6)	47 (4.3)	437 (7.7)	3 (1.4)	440 (18.3)	16 (3.0)	439 (9.8)	0 (0.0)	~ ~
Turkey	53 (4.0)	460 (6.8)	18 (2.7)	470 (12.1)	27 (3.3)	444 (8.0)	3 (1.3)	463 (20.1)	0 (0.0)	~ ~
United Arab Emirates	36 (2.0)	478 (4.2)	49 (2.1)	457 (3.6)	10 (1.2)	445 (13.0)	5 (1.1)	493 (20.1)	0 (0.3)	~ ~
United States	35 (2.9)	521 (4.9)	12 (1.6)	512 (8.5)	22 (2.4)	513 (8.2)	31 (2.8)	522 (5.9)	0 (0.0)	~ ~
International Avg.	36 (0.6)	483 (1.1)	36 (0.5)	482 (1.2)	13 (0.4)	481 (2.1)	13 (0.4)	477 (2.4)	2 (0.2)	396 (4.3)
Benchmarking Participants										
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
Ontario, Canada	6 (2.0)	524 (11.8)	3 (1.3)	524 (10.9)	7 (2.0)	538 (10.1)	84 (2.9)	524 (3.3)	0 (0.0)	~ ~
Quebec, Canada	43 (5.4)	557 (6.0)	16 (3.9)	543 (8.1)	25 (5.6)	561 (6.2)	15 (3.3)	522 (8.6)	0 (0.0)	~ ~
Norway (8)	19 (3.5)	482 (5.5)	51 (4.1)	489 (3.0)	3 (1.3)	498 (13.3)	27 (3.2)	487 (3.4)	0 (0.0)	~ ~
Abu Dhabi, UAE	26 (4.0)	449 (10.7)	51 (4.4)	435 (7.1)	17 (3.2)	438 (19.2)	5 (2.0)	483 (36.3)	0 (0.4)	~ ~
Dubai, UAE	46 (2.9)	516 (3.9)	45 (2.9)	510 (4.6)	5 (1.2)	490 (19.5)	4 (1.0)	555 (21.7)	1 (0.8)	~ ~
Florida, US r	26 (5.3)	498 (19.3)	24 (6.5)	506 (15.2)	14 (4.4)	532 (17.0)	35 (6.7)	489 (13.8)	0 (0.0)	~ ~

* Countries have been increasing their certification requirements and providing professional development to teachers certified under earlier guidelines.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.5: Teachers' Years of Experience

Reported by Teachers

Country	20 Years or More		At Least 10 but Less than 20 Years		At Least 5 but Less than 10 Years		Less than 5 Years		Average Years of Experience
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	36 (4.0)	522 (4.2)	24 (3.3)	519 (5.8)	17 (2.8)	518 (7.2)	23 (3.8)	510 (10.4)	15 (0.9)
Bahrain	10 (1.3)	463 (9.7)	44 (2.8)	455 (3.2)	18 (1.4)	455 (4.1)	29 (2.2)	444 (3.6)	10 (0.2)
Belgium (Flemish)	42 (3.5)	552 (3.7)	34 (3.0)	545 (3.2)	15 (2.4)	538 (6.0)	10 (1.9)	535 (6.7)	18 (0.8)
Bulgaria	84 (2.7)	528 (5.2)	9 (2.0)	545 (14.3)	4 (1.4)	476 (21.5)	3 (1.2)	503 (17.8)	27 (0.7)
Canada	29 (2.8)	513 (2.8)	39 (2.6)	509 (4.2)	18 (2.2)	508 (5.7)	13 (1.4)	519 (5.8)	15 (0.5)
Chile	28 (3.7)	462 (6.2)	17 (3.5)	475 (8.0)	37 (4.7)	457 (5.6)	18 (3.7)	445 (6.9)	13 (0.9)
Chinese Taipei	40 (3.9)	598 (2.9)	42 (4.2)	598 (3.2)	10 (2.5)	593 (7.5)	8 (1.9)	587 (5.0)	17 (0.6)
Croatia	67 (3.2)	506 (2.2)	21 (3.1)	498 (4.8)	8 (1.8)	488 (7.8)	4 (1.4)	500 (5.0)	24 (0.7)
Cyprus	33 (3.1)	524 (3.4)	52 (3.3)	523 (3.6)	13 (2.4)	518 (7.2)	2 (1.1)	~ ~	16 (0.5)
Czech Republic	50 (3.7)	529 (3.1)	30 (3.4)	526 (4.8)	10 (2.0)	533 (4.2)	10 (2.2)	524 (5.9)	20 (0.8)
Denmark	29 (3.5)	537 (6.0)	38 (3.8)	538 (3.9)	17 (2.9)	544 (6.3)	16 (3.0)	529 (8.3)	15 (0.8)
England	19 (3.2)	557 (8.7)	24 (3.4)	531 (6.4)	22 (3.6)	557 (10.5)	35 (3.8)	546 (5.1)	11 (0.7)
Finland	38 (2.7)	539 (2.5)	31 (3.1)	533 (3.7)	15 (1.8)	535 (3.1)	16 (2.2)	530 (6.1)	16 (0.5)
France	26 (3.5)	497 (6.1)	42 (3.7)	488 (4.5)	21 (3.0)	484 (4.9)	10 (2.1)	472 (8.2)	15 (0.8)
Georgia	64 (4.3)	456 (5.4)	25 (3.8)	474 (7.5)	9 (2.7)	466 (14.3)	1 (1.1)	~ ~	22 (1.0)
Germany	56 (3.4)	525 (3.0)	25 (3.0)	523 (3.7)	9 (1.9)	508 (10.0)	10 (2.1)	515 (6.4)	22 (0.8)
Hong Kong SAR	27 (3.8)	608 (5.6)	43 (4.6)	613 (4.9)	17 (3.9)	629 (9.7)	13 (2.4)	613 (7.1)	15 (0.8)
Hungary	73 (3.2)	526 (3.6)	18 (2.8)	537 (7.7)	7 (1.3)	530 (11.2)	1 (0.7)	~ ~	24 (0.6)
Indonesia	36 (3.2)	397 (7.4)	35 (3.2)	406 (5.9)	19 (2.6)	401 (9.6)	10 (2.6)	382 (20.6)	16 (0.6)
Iran, Islamic Rep. of	48 (3.2)	441 (5.5)	26 (3.1)	421 (8.7)	13 (2.6)	428 (13.3)	13 (3.0)	425 (18.6)	17 (0.6)
Ireland	21 (3.5)	550 (5.2)	39 (4.1)	548 (4.8)	23 (3.4)	544 (4.8)	17 (2.8)	547 (5.7)	13 (0.8)
Italy	69 (3.5)	507 (2.9)	26 (3.2)	508 (5.5)	4 (1.6)	512 (9.8)	2 (1.1)	~ ~	24 (0.7)
Japan	40 (3.5)	591 (2.6)	19 (2.9)	601 (5.0)	16 (2.8)	590 (4.0)	25 (3.2)	591 (4.0)	16 (0.8)
Jordan	14 (2.8)	376 (12.7)	23 (3.6)	386 (9.6)	31 (3.4)	392 (6.8)	32 (3.7)	393 (7.8)	10 (0.6)
Kazakhstan	57 (3.8)	546 (6.2)	27 (3.4)	548 (8.8)	8 (1.7)	536 (17.7)	9 (2.5)	539 (12.6)	21 (0.9)
Korea, Rep. of	35 (3.7)	617 (4.2)	31 (3.4)	606 (3.3)	14 (2.2)	610 (6.3)	21 (3.0)	595 (4.8)	16 (0.7)
Kuwait r	12 (3.0)	369 (14.3)	26 (2.6)	352 (9.5)	33 (3.4)	346 (8.6)	29 (3.6)	349 (8.8)	9 (0.6)
Lithuania	83 (2.8)	534 (3.0)	14 (2.7)	549 (9.3)	2 (1.0)	~ ~	1 (0.6)	~ ~	28 (0.6)
Morocco	42 (2.8)	369 (4.6)	35 (3.5)	363 (5.6)	8 (2.0)	396 (18.0)	15 (2.2)	417 (16.2)	18 (0.6)
Netherlands r	32 (4.0)	533 (3.0)	38 (4.2)	528 (2.8)	20 (3.1)	527 (4.3)	10 (2.5)	532 (5.8)	17 (1.0)
New Zealand	27 (2.3)	498 (6.1)	34 (2.8)	490 (3.2)	21 (2.0)	490 (5.1)	18 (1.8)	485 (8.2)	14 (0.5)
Northern Ireland r	34 (4.3)	578 (6.2)	31 (4.1)	575 (5.6)	21 (3.8)	571 (7.8)	14 (3.1)	556 (8.6)	15 (0.8)
Norway (5)	23 (3.8)	552 (4.4)	42 (4.1)	551 (3.6)	21 (3.9)	547 (7.0)	14 (2.7)	549 (4.8)	14 (0.9)
Oman	8 (1.6)	422 (10.7)	48 (3.2)	434 (4.1)	33 (3.1)	421 (4.8)	10 (1.6)	409 (12.3)	10 (0.3)
Poland	46 (3.5)	538 (3.3)	35 (3.7)	526 (3.6)	12 (2.4)	537 (8.1)	7 (1.8)	549 (10.3)	19 (0.6)
Portugal	50 (3.5)	541 (4.1)	46 (3.5)	541 (4.1)	3 (1.1)	549 (14.6)	1 (0.6)	~ ~	22 (0.6)
Qatar	14 (2.9)	463 (10.8)	21 (2.8)	431 (10.7)	43 (3.7)	431 (6.3)	21 (2.9)	451 (7.4)	10 (0.6)
Russian Federation	78 (2.8)	569 (4.3)	12 (2.5)	554 (9.9)	5 (1.3)	561 (7.8)	4 (1.7)	526 (15.5)	25 (0.7)
Saudi Arabia	23 (3.0)	382 (7.9)	34 (3.5)	374 (8.6)	27 (3.4)	385 (7.9)	16 (2.9)	405 (11.5)	13 (0.6)
Serbia	61 (3.5)	516 (5.4)	23 (3.0)	523 (4.9)	9 (2.2)	528 (8.4)	7 (2.3)	513 (10.7)	20 (0.7)
Singapore	14 (1.9)	615 (8.8)	30 (2.5)	617 (7.4)	23 (2.2)	621 (8.3)	32 (2.4)	617 (5.8)	11 (0.5)
Slovak Republic	63 (2.7)	500 (2.9)	22 (2.8)	494 (6.0)	6 (1.6)	507 (9.7)	8 (1.9)	496 (9.4)	23 (0.6)
Slovenia	64 (3.0)	522 (2.4)	27 (3.2)	520 (3.7)	6 (1.5)	506 (6.1)	3 (1.1)	534 (8.9)	24 (0.6)
South Africa (5)	44 (3.9)	373 (6.2)	26 (3.0)	375 (10.0)	19 (2.9)	359 (12.7)	10 (2.1)	415 (20.6)	17 (0.8)
Spain	52 (3.4)	507 (3.7)	29 (3.0)	502 (4.1)	11 (2.0)	496 (7.5)	8 (1.8)	518 (5.8)	21 (0.8)
Sweden	21 (3.6)	519 (4.1)	43 (4.5)	517 (5.5)	21 (3.5)	518 (6.3)	15 (3.2)	523 (6.3)	15 (0.9)
Turkey	35 (3.3)	511 (5.1)	33 (3.4)	489 (4.8)	17 (2.4)	471 (8.2)	15 (2.2)	419 (13.5)	16 (0.6)
United Arab Emirates	12 (1.6)	474 (8.8)	32 (2.4)	447 (5.2)	31 (2.7)	453 (6.9)	25 (2.1)	453 (6.4)	10 (0.3)
United States	24 (2.4)	544 (5.5)	35 (2.8)	540 (3.8)	20 (2.1)	535 (6.2)	21 (2.5)	530 (4.9)	13 (0.5)
International Avg.	40 (0.5)	508 (0.9)	31 (0.5)	505 (0.9)	16 (0.4)	502 (1.3)	13 (0.3)	500 (1.5)	17 (0.1)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report achievement.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.5: Teachers' Years of Experience (Continued)

Country	20 Years or More		At Least 10 but Less than 20 Years		At Least 5 but Less than 10 Years		Less than 5 Years		Average Years of Experience
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants									
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x	x x	x x
Ontario, Canada	29 (3.4)	510 (4.5)	43 (3.9)	514 (3.5)	16 (3.0)	516 (7.8)	13 (2.2)	523 (6.6)	15 (0.6)
Quebec, Canada	35 (6.1)	535 (4.2)	34 (4.5)	533 (7.2)	20 (4.9)	530 (7.4)	12 (3.3)	562 (12.8)	15 (1.1)
Norway (4)	29 (4.0)	500 (3.8)	34 (4.0)	491 (3.9)	21 (2.8)	494 (4.6)	16 (3.1)	494 (7.8)	15 (0.8)
Abu Dhabi, UAE	10 (3.0)	460 (25.2)	32 (4.3)	405 (11.6)	35 (4.6)	415 (11.5)	23 (3.5)	433 (13.3)	10 (0.6)
Dubai, UAE	16 (2.4)	518 (5.7)	33 (3.4)	508 (4.7)	25 (3.3)	516 (6.5)	25 (3.0)	510 (7.6)	11 (0.5)
Florida, US r	24 (4.4)	553 (11.0)	34 (4.2)	561 (7.0)	26 (5.3)	533 (7.6)	16 (3.5)	530 (13.6)	13 (1.0)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.6: Teachers' Years of Experience

Reported by Teachers

Country	20 Years or More		At Least 10 but Less than 20 Years		At Least 5 but Less than 10 Years		Less than 5 Years		Average Years of Experience
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	36 (3.3)	514 (5.5)	28 (2.6)	505 (6.6)	19 (2.3)	508 (7.4)	18 (2.1)	498 (8.6)	16 (0.7)
Bahrain	20 (3.8)	455 (6.4)	41 (3.6)	453 (3.7)	22 (4.2)	463 (6.2)	18 (3.1)	437 (5.6)	12 (0.9)
Botswana (9)	8 (2.2)	398 (8.8)	32 (4.1)	386 (4.1)	22 (3.6)	401 (5.1)	38 (4.4)	388 (4.6)	9 (0.6)
Canada	28 (3.1)	533 (3.5)	45 (3.3)	527 (4.1)	15 (2.4)	532 (5.5)	12 (2.1)	536 (7.6)	15 (0.5)
Chile	36 (4.5)	430 (6.4)	21 (3.6)	431 (8.8)	22 (3.4)	430 (8.9)	21 (4.3)	429 (11.9)	16 (1.2)
Chinese Taipei	23 (3.4)	602 (7.1)	43 (4.0)	601 (4.7)	20 (3.3)	598 (7.3)	14 (2.6)	590 (9.7)	14 (0.7)
Egypt	46 (3.6)	394 (5.5)	22 (2.9)	405 (11.1)	23 (3.1)	376 (8.0)	9 (2.4)	393 (18.9)	17 (0.7)
England	17 (3.1)	511 (13.4)	25 (4.0)	524 (10.8)	29 (3.6)	508 (9.9)	29 (3.7)	525 (10.5)	11 (0.7)
Georgia	78 (3.1)	450 (4.0)	12 (2.7)	464 (12.2)	8 (2.0)	486 (16.3)	2 (0.8)	~ ~	26 (0.9)
Hong Kong SAR	32 (3.8)	603 (9.9)	26 (3.9)	586 (9.7)	25 (3.5)	589 (7.6)	17 (3.6)	601 (11.2)	14 (0.8)
Hungary	69 (3.6)	512 (4.5)	23 (3.5)	523 (11.1)	4 (1.5)	540 (26.8)	4 (1.1)	484 (26.4)	25 (0.8)
Iran, Islamic Rep. of	48 (3.8)	447 (6.7)	38 (3.8)	441 (6.5)	13 (2.2)	391 (7.8)	1 (0.7)	~ ~	18 (0.5)
Ireland	31 (2.8)	527 (5.2)	28 (2.5)	520 (7.3)	22 (2.1)	525 (6.1)	19 (2.4)	518 (4.8)	14 (0.6)
Israel	40 (2.5)	529 (7.4)	29 (2.5)	505 (10.6)	15 (1.9)	496 (9.6)	16 (1.7)	490 (9.9)	16 (0.5)
Italy	63 (4.1)	497 (3.6)	19 (3.2)	482 (5.6)	13 (2.7)	497 (6.3)	4 (1.6)	472 (19.4)	23 (1.0)
Japan	42 (3.6)	589 (3.7)	21 (3.0)	586 (7.5)	20 (2.7)	587 (5.0)	17 (2.5)	580 (5.3)	17 (0.8)
Jordan	14 (2.4)	383 (8.1)	26 (3.2)	392 (5.9)	34 (3.8)	390 (7.2)	26 (3.2)	378 (6.5)	10 (0.5)
Kazakhstan	57 (3.7)	536 (6.9)	21 (3.2)	521 (12.4)	12 (3.1)	515 (15.5)	10 (2.2)	517 (17.0)	20 (0.9)
Korea, Rep. of	36 (3.2)	609 (3.6)	22 (2.9)	606 (4.9)	15 (3.1)	610 (11.1)	26 (3.0)	599 (5.6)	14 (0.6)
Kuwait	21 (3.4)	392 (11.1)	36 (4.2)	401 (8.3)	30 (3.8)	393 (11.2)	13 (2.4)	371 (13.6)	13 (0.6)
Lebanon	25 (3.6)	456 (7.2)	32 (3.4)	433 (6.3)	27 (3.8)	441 (10.6)	16 (3.0)	440 (9.5)	13 (0.8)
Lithuania	76 (3.6)	511 (3.6)	18 (3.3)	518 (6.9)	4 (1.5)	472 (18.9)	2 (1.2)	~ ~	27 (0.8)
Malaysia	14 (2.4)	475 (10.8)	41 (4.0)	455 (7.4)	29 (4.0)	470 (8.3)	16 (2.9)	475 (8.9)	12 (0.6)
Malta	15 (0.1)	482 (2.6)	38 (0.2)	495 (1.6)	24 (0.1)	491 (2.0)	23 (0.1)	505 (2.2)	12 (0.0)
Morocco	54 (3.0)	392 (3.1)	14 (2.4)	375 (6.0)	11 (2.0)	379 (7.4)	20 (2.4)	374 (5.0)	20 (0.7)
New Zealand	40 (3.4)	502 (6.6)	26 (2.7)	485 (6.8)	14 (2.1)	493 (10.1)	21 (2.5)	488 (8.3)	17 (1.0)
Norway (9)	25 (3.5)	513 (4.1)	41 (4.1)	514 (3.9)	19 (2.9)	518 (4.3)	15 (2.7)	501 (4.1)	15 (0.8)
Oman	16 (2.4)	395 (6.9)	44 (3.9)	413 (4.2)	30 (3.1)	395 (5.4)	10 (2.0)	399 (8.3)	13 (0.5)
Qatar	20 (3.2)	439 (9.8)	43 (4.0)	432 (5.9)	28 (2.7)	437 (7.6)	9 (2.0)	452 (13.0)	13 (0.4)
Russian Federation	62 (3.3)	534 (5.7)	24 (3.5)	546 (9.1)	7 (1.7)	525 (9.8)	7 (1.7)	546 (22.6)	23 (0.7)
Saudi Arabia	14 (3.3)	374 (11.1)	39 (4.1)	375 (8.7)	26 (3.7)	361 (6.2)	21 (3.6)	357 (8.6)	11 (0.7)
Singapore	11 (1.6)	619 (14.8)	19 (2.2)	625 (8.3)	30 (2.4)	617 (7.4)	40 (2.5)	620 (5.8)	9 (0.4)
Slovenia	53 (3.3)	516 (2.7)	29 (2.9)	518 (4.4)	12 (2.1)	520 (6.5)	5 (1.3)	508 (7.9)	21 (0.7)
South Africa (9)	33 (3.5)	377 (8.7)	23 (3.4)	366 (8.8)	24 (3.2)	383 (13.1)	19 (2.9)	371 (9.2)	14 (0.7)
Sweden	21 (3.5)	502 (6.5)	46 (3.8)	504 (4.3)	20 (3.9)	502 (4.5)	13 (2.7)	482 (6.7)	14 (0.7)
Thailand	28 (3.1)	430 (8.8)	19 (3.0)	439 (14.3)	16 (2.7)	436 (10.8)	36 (3.8)	427 (8.7)	13 (0.9)
Turkey	11 (2.4)	476 (11.5)	31 (2.9)	497 (9.4)	25 (2.7)	452 (5.7)	33 (3.0)	420 (7.0)	10 (0.6)
United Arab Emirates	24 (2.2)	452 (6.6)	41 (2.5)	463 (5.0)	25 (2.3)	485 (5.9)	10 (1.1)	466 (8.2)	14 (0.3)
United States	25 (2.9)	527 (5.8)	38 (2.9)	509 (5.1)	18 (2.3)	526 (7.0)	19 (2.0)	520 (7.1)	14 (0.6)
International Avg.	34 (0.5)	484 (1.2)	30 (0.5)	483 (1.2)	20 (0.5)	480 (1.6)	17 (0.4)	477 (1.8)	16 (0.1)
Benchmarking Participants									
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x	x x	x x
Ontario, Canada	25 (4.2)	527 (4.9)	47 (4.4)	518 (4.6)	16 (3.2)	532 (6.6)	13 (2.4)	534 (10.2)	14 (0.6)
Quebec, Canada	38 (5.4)	543 (4.3)	45 (5.2)	549 (6.6)	11 (3.1)	559 (9.0)	6 (1.2)	571 (7.8)	17 (0.7)
Norway (8)	15 (2.6)	487 (5.5)	39 (4.3)	493 (3.2)	25 (3.6)	488 (4.5)	21 (3.1)	474 (4.7)	12 (0.7)
Abu Dhabi, UAE r	28 (4.7)	451 (15.1)	43 (4.6)	425 (9.5)	22 (3.7)	461 (12.2)	7 (1.9)	456 (27.6)	15 (0.7)
Dubai, UAE	15 (2.9)	490 (7.4)	42 (3.7)	511 (4.9)	31 (3.0)	528 (6.0)	12 (1.7)	506 (7.6)	12 (0.4)
Florida, US r	13 (4.4)	508 (27.4)	30 (6.5)	485 (15.7)	38 (7.9)	511 (14.5)	19 (5.9)	503 (14.6)	10 (1.1)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report achievement.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.7: Teacher Participation in Professional Development in Mathematics in the Past Two Years

Reported by Teachers

Teachers could indicate participating in more than one area of professional development.

Country	Percent of Students by Teachers' Area of Professional Development						
	Mathematics Content	Mathematics Pedagogy/ Instruction	Mathematics Curriculum	Integrating Information Technology into Mathematics	Improving Students' Critical Thinking or Problem Solving Skills	Mathematics Assessment	Addressing Individual Students' Needs
Australia	70 (2.7)	62 (3.9)	66 (4.1)	37 (3.8)	50 (4.2)	43 (3.6)	52 (4.0)
Bahrain	52 (1.6)	66 (2.0)	59 (2.9)	61 (2.0)	57 (3.9)	50 (3.4)	50 (2.0)
Belgium (Flemish)	14 (2.3)	16 (2.6)	22 (3.1)	25 (3.1)	18 (2.6)	10 (2.1)	42 (3.3)
Bulgaria	15 (2.7)	15 (2.8)	20 (4.0)	30 (3.8)	13 (2.9)	31 (3.3)	28 (3.5)
Canada	65 (2.9)	71 (2.6)	48 (2.6)	36 (2.7)	63 (2.2)	49 (2.7)	53 (2.5)
Chile	44 (4.2)	33 (4.1)	28 (4.4)	27 (4.2)	32 (4.4)	17 (3.7)	26 (3.9)
Chinese Taipei	44 (4.1)	50 (3.8)	46 (4.1)	34 (3.4)	40 (3.7)	39 (4.0)	62 (3.3)
Croatia	59 (3.7)	43 (4.0)	37 (3.7)	31 (3.6)	50 (3.8)	31 (3.3)	57 (4.0)
Cyprus	86 (2.2)	70 (2.6)	86 (2.3)	51 (3.3)	48 (3.3)	40 (3.5)	25 (3.1)
Czech Republic	21 (2.9)	31 (3.6)	9 (2.3)	40 (3.4)	29 (3.1)	9 (2.0)	36 (2.9)
Denmark	22 (3.5)	23 (3.2)	11 (2.3)	22 (3.1)	9 (2.1)	12 (2.4)	23 (3.3)
England	64 (3.7)	68 (3.6)	72 (3.8)	31 (3.9)	52 (3.9)	51 (4.2)	43 (4.1)
Finland	6 (1.3)	17 (2.3)	4 (1.3)	11 (2.2)	11 (2.0)	3 (0.9)	24 (2.7)
France	26 (3.0)	30 (2.9)	13 (2.3)	10 (2.2)	16 (2.6)	3 (1.0)	15 (2.5)
Georgia	30 (3.7)	38 (4.1)	34 (4.3)	59 (4.5)	49 (4.2)	38 (3.9)	48 (4.1)
Germany	43 (3.7)	33 (3.7)	32 (3.8)	1 (0.9)	32 (3.5)	20 (3.4)	45 (3.0)
Hong Kong SAR	78 (3.2)	83 (3.1)	53 (4.0)	69 (4.0)	73 (4.6)	45 (4.7)	51 (4.7)
Hungary	14 (3.0)	20 (3.0)	9 (2.3)	15 (2.8)	17 (2.6)	9 (2.2)	27 (3.6)
Indonesia	52 (3.6)	60 (3.6)	43 (3.6)	40 (3.4)	71 (2.8)	68 (3.1)	63 (3.3)
Iran, Islamic Rep. of	80 (2.6)	79 (3.0)	59 (3.3)	29 (3.5)	34 (3.6)	44 (3.8)	39 (3.5)
Ireland	46 (3.7)	37 (3.7)	38 (4.1)	34 (4.0)	45 (3.9)	25 (3.6)	27 (3.8)
Italy	16 (2.5)	28 (3.1)	20 (2.7)	26 (3.5)	20 (3.0)	12 (2.6)	28 (3.4)
Japan	43 (3.4)	52 (3.8)	13 (2.2)	23 (2.8)	30 (2.8)	16 (2.6)	44 (3.3)
Jordan	31 (4.1)	49 (4.0)	35 (4.1)	37 (3.3)	48 (3.8)	40 (3.9)	52 (3.9)
Kazakhstan	49 (4.1)	59 (4.0)	65 (4.1)	76 (3.8)	81 (3.2)	73 (3.6)	69 (4.0)
Korea, Rep. of	32 (3.6)	40 (3.8)	44 (3.9)	16 (3.0)	42 (4.1)	33 (4.0)	38 (4.0)
Kuwait	56 (3.5)	59 (3.1)	55 (3.5)	57 (3.5)	50 (3.8)	45 (3.6)	56 (3.8)
Lithuania	12 (2.4)	14 (2.8)	13 (2.6)	60 (4.0)	54 (3.7)	46 (3.4)	55 (3.6)
Morocco	13 (2.0)	19 (2.4)	15 (2.3)	8 (1.8)	19 (2.4)	19 (2.5)	24 (2.7)
Netherlands	r 22 (4.0)	r 28 (4.1)	r 15 (3.0)	r 18 (3.7)	r 23 (3.5)	r 19 (3.8)	r 49 (4.3)
New Zealand	74 (2.8)	70 (3.0)	63 (2.9)	42 (2.8)	59 (2.9)	58 (2.5)	62 (3.2)
Northern Ireland	r 50 (4.6)	r 63 (4.3)	r 54 (5.0)	r 40 (4.7)	r 46 (4.8)	r 57 (4.9)	r 45 (4.3)
Norway (5)	18 (3.0)	18 (2.7)	6 (1.8)	14 (3.2)	16 (3.4)	13 (2.9)	11 (2.7)
Oman	40 (2.8)	65 (2.8)	36 (3.4)	37 (2.8)	48 (3.1)	42 (2.9)	36 (2.7)
Poland	85 (2.6)	69 (3.9)	72 (3.3)	68 (3.6)	47 (3.8)	51 (3.9)	70 (3.6)
Portugal	46 (3.3)	37 (3.0)	49 (3.5)	23 (2.5)	22 (3.0)	13 (2.5)	24 (2.7)
Qatar	64 (3.1)	68 (2.7)	57 (3.2)	57 (2.8)	67 (2.8)	62 (2.9)	66 (3.4)
Russian Federation	37 (3.8)	43 (4.2)	68 (3.4)	67 (3.2)	51 (3.8)	66 (3.2)	55 (3.5)
Saudi Arabia	50 (4.0)	68 (3.7)	44 (4.3)	45 (3.4)	53 (4.1)	41 (4.4)	49 (4.1)
Serbia	49 (3.8)	33 (3.6)	29 (3.6)	19 (3.0)	45 (3.9)	30 (3.7)	42 (4.4)
Singapore	64 (2.9)	81 (2.6)	60 (2.5)	59 (2.7)	58 (2.8)	62 (2.9)	43 (2.7)
Slovak Republic	5 (1.3)	11 (2.0)	27 (2.8)	37 (3.4)	17 (2.8)	11 (2.0)	22 (2.9)
Slovenia	20 (3.0)	17 (2.5)	31 (3.7)	29 (3.5)	29 (3.7)	38 (3.7)	30 (3.4)
South Africa (5)	79 (2.5)	54 (3.1)	82 (2.6)	38 (3.4)	66 (3.3)	83 (2.3)	61 (3.2)
Spain	27 (3.5)	34 (4.2)	23 (2.9)	34 (3.9)	32 (3.5)	17 (2.5)	45 (3.7)
Sweden	56 (4.3)	58 (4.3)	43 (4.6)	10 (2.5)	50 (4.5)	49 (4.1)	24 (3.5)
Turkey	5 (1.5)	6 (1.4)	6 (1.6)	9 (2.0)	10 (2.1)	7 (1.8)	12 (2.3)
United Arab Emirates	60 (2.2)	59 (2.6)	59 (2.5)	60 (2.3)	72 (2.2)	60 (2.4)	67 (2.3)
United States	71 (2.4)	62 (2.5)	70 (2.5)	41 (2.3)	62 (2.8)	48 (2.7)	59 (2.6)
International Avg.	43 (0.5)	45 (0.5)	40 (0.5)	36 (0.5)	41 (0.5)	36 (0.5)	42 (0.5)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.7: Teacher Participation in Professional Development in Mathematics in the Past Two Years (Continued)

Country	Percent of Students by Teachers' Area of Professional Development						
	Mathematics Content	Mathematics Pedagogy/ Instruction	Mathematics Curriculum	Integrating Information Technology into Mathematics	Improving Students' Critical Thinking or Problem Solving Skills	Mathematics Assessment	Addressing Individual Students' Needs
Benchmarking Participants							
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x
Ontario, Canada	69 (4.2)	81 (2.9)	56 (4.0)	37 (4.1)	81 (3.1)	55 (3.9)	55 (4.2)
Quebec, Canada	62 (6.1)	63 (5.8)	31 (5.4)	33 (6.0)	38 (5.7)	47 (5.5)	40 (5.7)
Norway (4)	11 (2.4)	14 (2.8)	5 (1.8)	8 (2.5)	8 (2.1)	8 (1.9)	8 (1.8)
Abu Dhabi, UAE	63 (3.8)	57 (4.7)	64 (4.2)	58 (4.2)	73 (3.5)	51 (4.0)	66 (4.0)
Dubai, UAE	57 (1.8)	60 (2.4)	56 (1.9)	61 (2.0)	73 (1.8)	66 (2.3)	67 (1.6)
Florida, US	r 75 (4.8)	r 61 (6.3)	r 74 (5.1)	r 45 (6.5)	r 60 (4.4)	r 52 (5.4)	r 62 (5.1)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.8: Teacher Participation in Professional Development in Mathematics in the Past Two Years

Reported by Teachers

Teachers could indicate participating in more than one area of professional development.

Country	Percent of Students by Teachers' Area of Professional Development						
	Mathematics Content	Mathematics Pedagogy/ Instruction	Mathematics Curriculum	Integrating Information Technology into Mathematics	Improving Students' Critical Thinking or Problem Solving Skills	Mathematics Assessment	Addressing Individual Students' Needs
Australia	65 (2.6)	67 (2.7)	71 (2.8)	59 (2.6)	49 (3.9)	47 (3.4)	58 (3.8)
Bahrain	45 (3.2)	65 (2.9)	44 (2.7)	69 (2.9)	60 (3.5)	58 (3.6)	64 (3.6)
Botswana (9)	45 (4.1)	28 (3.7)	51 (4.8)	26 (4.1)	31 (4.3)	39 (4.3)	33 (4.5)
Canada	66 (3.1)	72 (3.2)	47 (3.3)	62 (3.2)	64 (3.2)	49 (3.7)	57 (2.6)
Chile	48 (4.0)	41 (4.6)	30 (3.5)	27 (4.1)	30 (4.0)	22 (3.7)	18 (3.2)
Chinese Taipei	78 (3.3)	65 (3.6)	72 (3.5)	60 (3.3)	40 (3.6)	65 (3.6)	46 (3.9)
Egypt	49 (4.0)	60 (3.7)	40 (3.6)	40 (3.5)	55 (4.0)	47 (4.1)	56 (3.9)
England	59 (4.2)	65 (4.4)	65 (3.7)	41 (4.7)	43 (4.4)	43 (4.3)	48 (4.4)
Georgia	39 (4.3)	41 (4.2)	41 (4.5)	53 (4.7)	40 (4.5)	34 (4.2)	35 (4.3)
Hong Kong SAR	63 (4.3)	64 (4.7)	51 (4.5)	58 (4.5)	42 (4.5)	42 (4.4)	50 (4.4)
Hungary	28 (3.3)	36 (3.3)	15 (2.7)	31 (3.5)	18 (2.7)	20 (3.2)	22 (3.3)
Iran, Islamic Rep. of	74 (3.0)	83 (2.9)	55 (3.9)	39 (3.5)	42 (3.4)	40 (2.7)	36 (3.0)
Ireland	94 (1.2)	78 (2.6)	91 (1.7)	65 (2.9)	71 (2.5)	40 (2.6)	35 (2.7)
Israel	69 (2.7)	70 (2.5)	60 (2.9)	65 (2.8)	42 (3.4)	34 (2.5)	51 (2.6)
Italy	26 (3.3)	40 (3.4)	30 (3.7)	41 (4.0)	25 (3.2)	24 (3.3)	45 (4.1)
Japan	70 (3.0)	68 (3.6)	28 (3.6)	39 (3.6)	30 (3.4)	23 (3.3)	37 (3.7)
Jordan	25 (3.3)	36 (3.4)	24 (2.7)	31 (3.3)	49 (3.3)	26 (3.4)	42 (3.8)
Kazakhstan	59 (3.9)	73 (3.9)	60 (4.2)	82 (3.2)	75 (3.7)	66 (4.0)	66 (3.8)
Korea, Rep. of	51 (3.1)	63 (3.3)	44 (3.1)	32 (3.1)	34 (3.3)	46 (3.8)	38 (3.3)
Kuwait	63 (4.1)	62 (4.3)	61 (4.0)	45 (3.9)	56 (3.8)	50 (4.0)	57 (4.3)
Lebanon	57 (4.8)	60 (4.3)	51 (4.5)	53 (4.3)	53 (4.1)	57 (4.7)	47 (4.6)
Lithuania	62 (4.4)	61 (4.3)	57 (3.8)	70 (3.5)	53 (3.6)	68 (3.5)	50 (4.6)
Malaysia	47 (3.6)	65 (3.6)	46 (3.7)	36 (4.0)	70 (3.7)	56 (3.3)	33 (3.6)
Malta	45 (0.1)	60 (0.2)	54 (0.2)	57 (0.1)	33 (0.1)	41 (0.1)	44 (0.1)
Morocco	23 (3.0)	27 (2.9)	20 (2.8)	41 (3.0)	14 (2.3)	24 (2.9)	13 (2.5)
New Zealand	66 (3.2)	63 (3.6)	61 (2.6)	58 (3.5)	37 (3.2)	51 (2.6)	48 (3.0)
Norway (9)	18 (3.3)	24 (3.6)	11 (2.6)	36 (3.2)	12 (2.7)	22 (3.5)	12 (2.5)
Oman	50 (3.4)	56 (3.5)	36 (3.2)	38 (3.1)	41 (3.0)	36 (3.1)	27 (2.7)
Qatar	67 (3.0)	71 (3.1)	60 (3.5)	62 (3.5)	59 (3.2)	62 (2.8)	64 (3.1)
Russian Federation	70 (3.7)	79 (3.1)	77 (3.2)	78 (2.4)	42 (3.6)	51 (4.0)	51 (3.7)
Saudi Arabia	49 (4.8)	69 (4.3)	36 (4.1)	37 (3.8)	44 (4.5)	33 (4.1)	40 (4.3)
Singapore	68 (2.5)	90 (1.7)	65 (2.6)	62 (2.6)	55 (2.7)	51 (2.9)	38 (2.9)
Slovenia	60 (3.5)	57 (3.6)	36 (2.7)	55 (3.2)	36 (3.3)	40 (3.2)	35 (2.9)
South Africa (9)	84 (3.0)	58 (3.6)	86 (2.4)	45 (3.5)	56 (3.2)	73 (2.7)	52 (3.7)
Sweden	58 (4.6)	70 (4.4)	39 (4.5)	18 (2.5)	52 (4.1)	52 (4.0)	25 (3.6)
Thailand	70 (3.5)	73 (3.6)	56 (4.1)	63 (3.5)	57 (3.9)	50 (3.9)	31 (3.4)
Turkey	19 (2.6)	27 (3.2)	25 (3.0)	27 (3.0)	26 (3.0)	33 (3.3)	21 (2.7)
United Arab Emirates	59 (2.4)	60 (2.8)	60 (2.3)	71 (2.1)	71 (2.2)	59 (2.6)	68 (2.1)
United States	78 (2.5)	70 (2.7)	84 (2.0)	65 (2.9)	62 (2.7)	61 (2.8)	59 (3.1)
International Avg.	56 (0.6)	59 (0.6)	50 (0.5)	50 (0.5)	45 (0.6)	44 (0.6)	42 (0.6)
Benchmarking Participants							
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x
Ontario, Canada	r 74 (3.9)	r 79 (4.1)	r 57 (4.1)	r 60 (4.2)	r 81 (3.2)	r 53 (4.9)	r 61 (3.8)
Quebec, Canada	49 (5.2)	58 (4.5)	26 (5.2)	70 (4.7)	30 (5.7)	39 (5.4)	57 (4.0)
Norway (8)	20 (3.5)	25 (3.6)	12 (2.5)	36 (3.8)	11 (2.8)	20 (3.5)	11 (2.6)
Abu Dhabi, UAE	45 (4.3)	51 (4.9)	47 (4.8)	61 (4.9)	71 (4.1)	50 (4.9)	74 (4.0)
Dubai, UAE	71 (2.6)	68 (3.0)	73 (2.5)	83 (2.0)	76 (2.7)	59 (3.2)	67 (3.2)
Florida, US	r 82 (6.4)	r 77 (7.4)	r 81 (6.5)	r 67 (8.2)	r 67 (7.1)	r 66 (6.6)	r 67 (6.0)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.9: Principals' Formal Education*

Principal Education Level Reported by Principals and Current Requirements Reported by National Research Coordinators

Country		Percent of Students by Principal Educational Level			Current Requirements	
		Completed Postgraduate University Degree**	Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree	Did Not Complete Bachelor's Degree	Teaching Experience	Completion of Specialized School Leadership Training Program
Australia		38 (3.9)	59 (4.1)	3 (1.4)	●	○
Bahrain		36 (0.2)	61 (0.2)	3 (0.0)	●	●
Belgium (Flemish)		4 (1.7)	96 (1.8)	0 (0.4)	●	Varies by educational network
Bulgaria		98 (1.1)	2 (1.1)	0 (0.0)	●	○
Canada		62 (2.7)	38 (2.7)	0 (0.0)	●	●
Chile		62 (4.6)	38 (4.6)	0 (0.0)	●	●
Chinese Taipei		88 (2.7)	12 (2.7)	0 (0.0)	●	●
Croatia		6 (2.1)	88 (3.0)	6 (2.1)	●	○
Cyprus		74 (4.0)	22 (3.6)	4 (2.3)	●	○
Czech Republic		100 (0.0)	0 (0.0)	0 (0.0)	●	●
Denmark	r	19 (3.0)	75 (3.6)	7 (2.1)	○	○
England		57 (4.3)	42 (4.2)	1 (1.0)	○	○
Finland		94 (2.0)	6 (2.0)	0 (0.0)	●	○
France		23 (3.5)	48 (4.3)	29 (3.5)	●	○
Georgia		98 (1.4)	2 (1.4)	0 (0.0)	○	○
Germany		88 (1.4)	1 (0.6)	12 (1.5)	●	○
Hong Kong SAR		71 (4.0)	28 (3.8)	2 (1.2)	●	●
Hungary		41 (4.5)	59 (4.5)	1 (0.8)	○	●
Indonesia		15 (2.6)	67 (3.6)	18 (2.4)	●	●
Iran, Islamic Rep. of		13 (2.5)	73 (3.3)	14 (2.8)	○	○
Ireland		37 (4.1)	61 (4.3)	2 (1.3)	●	○
Italy		24 (3.7)	70 (4.0)	7 (2.0)	●	○
Japan		9 (2.6)	91 (2.6)	0 (0.0)	●	○
Jordan		49 (4.0)	49 (3.9)	2 (1.1)	○	○
Kazakhstan		9 (2.0)	90 (2.2)	1 (0.8)	●	●
Korea, Rep. of		83 (2.9)	16 (2.7)	1 (1.0)	●	●
Kuwait		18 (2.5)	54 (4.3)	28 (3.8)	●	●
Lithuania		48 (3.6)	52 (3.6)	0 (0.0)	●	○
Morocco		5 (1.3)	54 (3.9)	41 (3.7)	●	●
Netherlands	s	19 (4.5)	61 (5.0)	20 (3.9)	○	●
New Zealand		44 (3.7)	37 (3.6)	19 (3.0)	●	○
Northern Ireland	r	83 (3.8)	16 (3.6)	1 (1.2)	●	○
Norway (5)		35 (4.3)	61 (4.4)	4 (1.6)	○	○
Oman		21 (2.2)	61 (2.9)	18 (2.2)	●	○
Poland		100 (0.0)	0 (0.0)	0 (0.0)	●	●
Portugal		33 (4.2)	65 (4.2)	2 (1.1)	●	○
Qatar		44 (2.9)	53 (2.9)	2 (1.4)	●	●
Russian Federation		83 (2.9)	17 (2.9)	0 (0.2)	●	○
Saudi Arabia		4 (1.8)	81 (3.2)	15 (2.8)	●	○
Serbia		29 (3.6)	70 (3.9)	2 (1.3)	●	○
Singapore		59 (0.0)	39 (0.0)	3 (0.0)	●	●
Slovak Republic		100 (0.0)	0 (0.0)	0 (0.0)	●	●
Slovenia		99 (0.8)	1 (0.8)	0 (0.0)	●	●
South Africa (5)		12 (2.2)	66 (3.3)	22 (2.8)	●	○
Spain		9 (1.8)	82 (2.6)	9 (2.3)	●	○
Sweden		32 (3.9)	60 (4.2)	8 (2.4)	○	●
Turkey		23 (3.0)	68 (3.5)	9 (2.0)	●	○
United Arab Emirates		54 (2.2)	45 (2.2)	1 (0.5)	●	●
United States		97 (1.2)	3 (1.2)	0 (0.0)	●	●
International Avg.		48 (0.4)	46 (0.5)	6 (0.3)		

● Yes
○ No

* Based on countries' categorizations according to UNESCO's International Standard Classification of Education (Operational Manual for ISCED-2011).
** For example, doctorate, master's, or other postgraduate degree.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.9: Principals' Formal Education* (Continued)

Country		Percent of Students by Principal Educational Level			Current Requirements	
		Completed Postgraduate University Degree**	Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree	Did Not Complete Bachelor's Degree	Teaching Experience	Completion of Specialized School Leadership Training Program
Benchmarking Participants						
Buenos Aires, Argentina	s	12 (3.8)	72 (5.6)	16 (4.4)	●	○
Ontario, Canada		50 (4.1)	50 (4.1)	0 (0.0)	●	●
Quebec, Canada		68 (5.1)	32 (5.1)	0 (0.1)	●	○
Norway (4)		36 (4.5)	61 (4.5)	3 (1.5)	○	○
Abu Dhabi, UAE		45 (5.1)	53 (5.1)	1 (0.9)	●	●
Dubai, UAE		64 (0.3)	35 (0.3)	0 (0.0)	●	○
Florida, US	r	100 (0.0)	0 (0.0)	0 (0.0)	●	●

● Yes
○ No

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.10: Principals' Formal Education*

Principal Education Level Reported by Principals and Current Requirements Reported by National Research Coordinators

Country		Percent of Students by Principal Educational Level			Current Requirements	
		Completed Postgraduate University Degree**	Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree	Did Not Complete Bachelor's Degree	Teaching Experience	Completion of Specialized School Leadership Training Program
Australia		56 (3.3)	43 (3.1)	1 (1.0)	●	○
Bahrain		36 (0.2)	64 (0.2)	0 (0.0)	●	●
Botswana (9)		12 (2.9)	76 (4.0)	12 (2.8)	●	○
Canada		56 (3.1)	44 (3.1)	0 (0.0)	●	●
Chile		64 (4.6)	36 (4.6)	0 (0.0)	●	●
Chinese Taipei		83 (3.0)	17 (3.0)	0 (0.0)	●	●
Egypt		6 (1.6)	87 (2.3)	7 (1.8)	–	–
England	r	87 (3.4)	13 (3.4)	0 (0.0)	○	○
Georgia		98 (1.3)	2 (1.3)	0 (0.0)	○	○
Hong Kong SAR		89 (2.9)	11 (2.9)	0 (0.0)	●	●
Hungary		43 (4.6)	57 (4.6)	0 (0.0)	○	●
Iran, Islamic Rep. of		16 (2.9)	77 (3.1)	7 (1.7)	○	○
Ireland		65 (4.2)	34 (4.2)	1 (1.0)	●	○
Israel		89 (2.0)	10 (1.9)	0 (0.4)	●	●
Italy	r	20 (3.6)	74 (4.2)	6 (2.2)	●	○
Japan		8 (2.4)	92 (2.4)	0 (0.0)	●	○
Jordan		50 (3.8)	48 (3.9)	2 (0.9)	○	○
Kazakhstan		14 (2.5)	86 (2.5)	0 (0.5)	●	●
Korea, Rep. of		79 (3.1)	21 (3.1)	0 (0.0)	●	●
Kuwait		17 (2.9)	72 (3.3)	11 (1.9)	●	●
Lebanon		58 (4.6)	28 (4.2)	15 (3.4)	●	●
Lithuania		54 (4.7)	46 (4.7)	0 (0.0)	●	○
Malaysia		35 (4.4)	65 (4.4)	0 (0.0)	●	●
Malta		58 (0.1)	42 (0.1)	0 (0.0)	●	●
Morocco		8 (1.7)	63 (3.1)	29 (2.6)	●	●
New Zealand		65 (4.6)	32 (4.2)	2 (2.2)	●	○
Norway (9)		41 (4.6)	58 (4.6)	1 (1.0)	○	○
Oman		27 (2.8)	68 (2.9)	5 (1.5)	●	●
Qatar		41 (0.5)	57 (0.5)	3 (0.0)	●	●
Russian Federation		84 (3.0)	16 (3.0)	0 (0.0)	●	○
Saudi Arabia		18 (3.3)	72 (3.6)	9 (2.3)	●	○
Singapore		61 (0.0)	39 (0.0)	0 (0.0)	●	●
Slovenia		99 (0.7)	1 (0.7)	0 (0.0)	●	●
South Africa (9)		12 (2.1)	80 (2.6)	8 (1.8)	●	○
Sweden		33 (4.1)	60 (4.6)	8 (2.5)	○	●
Thailand		94 (1.9)	6 (1.9)	0 (0.0)	●	●
Turkey		23 (3.0)	76 (3.1)	2 (0.8)	●	○
United Arab Emirates		50 (1.9)	48 (2.0)	2 (0.6)	●	●
United States		98 (0.7)	2 (0.7)	0 (0.0)	●	●
International Avg.		50 (0.5)	47 (0.5)	3 (0.2)		
Benchmarking Participants						
Buenos Aires, Argentina	s	22 (5.1)	72 (5.6)	5 (2.5)	●	○
Ontario, Canada		51 (4.4)	49 (4.4)	0 (0.0)	●	●
Quebec, Canada		61 (5.7)	39 (5.7)	0 (0.0)	●	●
Norway (8)		42 (4.6)	57 (4.6)	1 (1.0)	○	○
Abu Dhabi, UAE		38 (4.7)	59 (4.9)	3 (1.5)	●	●
Dubai, UAE		67 (0.3)	32 (0.3)	1 (0.0)	●	○
Florida, US	s	100 (0.0)	0 (0.0)	0 (0.0)	●	●

● Yes
○ No

* Based on countries' categorizations according to UNESCO's International Standard Classification of Education (Operational Manual for ISCED-2011).
** For example, doctorate, master's, or other postgraduate degree.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available.
An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.11: Principals' Years of Experience

Reported by Principals

Country		Percent of Students by Principals' Years of Experience as a Principal				Average Years of Experience as a Principal
		20 Years or More	At Least 10 but Less than 20 Years	At Least 5 but Less than 10 Years	Less than 5 Years	
Australia		18 (3.0)	31 (3.5)	26 (3.4)	25 (3.9)	11 (0.6)
Bahrain		8 (0.1)	13 (0.2)	37 (0.2)	43 (0.2)	7 (0.0)
Belgium (Flemish)		4 (1.6)	40 (3.8)	32 (3.5)	24 (4.0)	9 (0.5)
Bulgaria		22 (3.4)	42 (5.6)	20 (3.8)	16 (4.1)	13 (0.7)
Canada		3 (0.9)	35 (3.3)	30 (2.8)	32 (2.6)	8 (0.3)
Chile		17 (3.5)	24 (3.8)	22 (3.9)	37 (4.5)	10 (0.8)
Chinese Taipei		4 (1.7)	37 (4.0)	32 (3.6)	27 (3.7)	9 (0.4)
Croatia		11 (3.0)	30 (3.4)	22 (2.6)	36 (3.8)	9 (0.7)
Cyprus		6 (1.4)	3 (1.4)	27 (4.6)	65 (4.9)	5 (0.4)
Czech Republic		13 (2.5)	42 (4.2)	23 (3.6)	22 (3.3)	11 (0.6)
Denmark	r	20 (3.3)	36 (3.9)	21 (3.3)	22 (3.8)	12 (0.7)
England		4 (1.7)	38 (4.6)	24 (3.7)	34 (4.6)	9 (0.5)
Finland		18 (3.4)	38 (4.1)	25 (4.0)	18 (3.5)	12 (0.7)
France		9 (2.7)	40 (4.5)	27 (4.0)	23 (4.1)	10 (0.6)
Georgia		17 (3.2)	15 (3.1)	38 (4.6)	30 (4.4)	9 (0.7)
Germany		15 (2.7)	25 (3.1)	29 (3.4)	30 (3.7)	10 (0.6)
Hong Kong SAR		14 (3.0)	44 (4.3)	20 (4.0)	22 (3.1)	12 (0.6)
Hungary		14 (3.3)	32 (4.3)	31 (3.8)	22 (3.6)	11 (0.7)
Indonesia		5 (1.5)	17 (2.7)	42 (3.6)	36 (3.6)	7 (0.4)
Iran, Islamic Rep. of		16 (2.6)	38 (3.5)	25 (2.8)	21 (3.1)	11 (0.6)
Ireland		17 (3.5)	32 (4.3)	22 (3.6)	30 (4.1)	11 (0.8)
Italy		15 (3.1)	25 (3.8)	30 (3.7)	30 (3.5)	10 (0.7)
Japan		0 (0.0)	5 (1.8)	39 (4.0)	56 (3.9)	4 (0.2)
Jordan		13 (2.3)	23 (3.2)	36 (3.1)	28 (3.6)	9 (0.6)
Kazakhstan		14 (2.5)	28 (3.7)	29 (3.8)	30 (3.6)	10 (0.7)
Korea, Rep. of		33 (4.2)	0 (0.0)	22 (3.1)	45 (4.1)	14 (1.4)
Kuwait		12 (2.9)	19 (4.0)	45 (4.3)	24 (3.8)	9 (0.7)
Lithuania		40 (3.6)	36 (3.6)	19 (3.0)	6 (1.9)	17 (0.6)
Morocco		3 (1.0)	57 (2.9)	26 (2.7)	13 (2.1)	11 (0.2)
Netherlands	s	13 (4.0)	30 (4.7)	28 (4.8)	30 (4.9)	10 (1.0)
New Zealand		31 (3.4)	34 (3.5)	20 (3.1)	15 (2.7)	14 (0.6)
Northern Ireland	r	17 (3.7)	36 (4.8)	24 (4.9)	23 (4.9)	12 (0.8)
Norway (5)		11 (3.1)	24 (3.6)	33 (4.2)	32 (4.6)	9 (0.7)
Oman		14 (2.5)	44 (3.4)	19 (2.7)	23 (3.0)	11 (0.5)
Poland		16 (3.3)	44 (4.0)	26 (3.2)	13 (3.1)	12 (0.6)
Portugal		11 (2.5)	29 (4.3)	38 (4.4)	22 (3.0)	10 (0.6)
Qatar		8 (1.7)	21 (2.9)	43 (3.7)	28 (2.9)	8 (0.4)
Russian Federation		21 (3.4)	29 (3.9)	24 (3.6)	26 (3.5)	12 (0.7)
Saudi Arabia		14 (2.7)	33 (3.7)	22 (3.1)	31 (4.0)	11 (0.6)
Serbia		1 (0.8)	33 (3.8)	23 (3.5)	43 (3.5)	7 (0.4)
Singapore		2 (0.0)	41 (0.0)	30 (0.0)	27 (0.0)	8 (0.0)
Slovak Republic		13 (2.6)	38 (4.1)	20 (3.3)	29 (3.4)	10 (0.6)
Slovenia		7 (2.1)	37 (4.2)	33 (4.3)	23 (3.7)	10 (0.5)
South Africa (5)		20 (3.5)	29 (2.9)	21 (2.6)	29 (3.7)	11 (0.8)
Spain		6 (1.4)	27 (3.5)	29 (3.4)	38 (3.7)	8 (0.4)
Sweden		12 (3.1)	32 (4.4)	31 (3.6)	25 (2.9)	10 (0.6)
Turkey		8 (2.1)	24 (3.5)	29 (3.1)	39 (3.3)	8 (0.6)
United Arab Emirates	r	20 (1.8)	27 (1.8)	28 (2.2)	25 (1.8)	11 (0.3)
United States	r	5 (1.6)	27 (3.1)	27 (3.2)	42 (3.6)	7 (0.4)
International Avg.		13 (0.4)	30 (0.5)	28 (0.5)	29 (0.5)	10 (0.1)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.11: Principals' Years of Experience (Continued)

Country		Percent of Students by Principals' Years of Experience as a Principal				Average Years of Experience as a Principal
		20 Years or More	At Least 10 but Less than 20 Years	At Least 5 but Less than 10 Years	Less than 5 Years	
Benchmarking Participants						
Buenos Aires, Argentina	s	9 (3.1)	13 (4.0)	36 (5.1)	42 (5.1)	8 (0.6)
Ontario, Canada		0 (0.0)	38 (5.7)	31 (4.5)	31 (4.3)	8 (0.4)
Quebec, Canada		4 (2.5)	37 (5.1)	29 (5.1)	30 (4.9)	9 (0.7)
Norway (4)		10 (2.6)	24 (3.4)	33 (4.4)	32 (4.8)	9 (0.7)
Abu Dhabi, UAE	r	21 (3.9)	34 (4.1)	19 (4.4)	26 (3.9)	11 (0.7)
Dubai, UAE		12 (0.2)	25 (0.2)	36 (0.3)	27 (0.3)	10 (0.0)
Florida, US	r	4 (2.9)	25 (6.6)	29 (7.4)	42 (7.1)	7 (0.9)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 8.12: Principals' Years of Experience

Reported by Principals

Country		Percent of Students by Principals' Years of Experience as a Principal				Average Years of Experience as a Principal
		20 Years or More	At Least 10 but Less than 20 Years	At Least 5 but Less than 10 Years	Less than 5 Years	
Australia		12 (2.4)	32 (4.3)	32 (4.1)	23 (3.4)	10 (0.5)
Bahrain		4 (0.1)	13 (0.2)	32 (0.2)	52 (0.3)	6 (0.0)
Botswana (9)		6 (2.2)	19 (2.9)	41 (4.4)	33 (4.2)	8 (0.5)
Canada		0 (0.3)	32 (3.5)	35 (3.6)	32 (3.6)	8 (0.4)
Chile		17 (3.3)	21 (3.4)	24 (3.7)	38 (4.0)	10 (0.8)
Chinese Taipei		6 (2.0)	29 (3.7)	30 (3.6)	35 (3.8)	8 (0.5)
Egypt		3 (1.2)	20 (3.5)	27 (3.6)	50 (4.3)	6 (0.5)
England	r	1 (1.0)	28 (4.7)	36 (4.5)	35 (4.8)	7 (0.5)
Georgia		16 (3.0)	15 (3.1)	38 (4.4)	31 (4.4)	9 (0.7)
Hong Kong SAR		12 (2.9)	31 (4.2)	33 (4.2)	24 (3.9)	11 (0.7)
Hungary		15 (3.5)	31 (4.4)	32 (3.9)	22 (3.5)	11 (0.7)
Iran, Islamic Rep. of		13 (2.1)	36 (3.1)	27 (2.5)	24 (3.0)	10 (0.5)
Ireland		7 (2.3)	24 (3.4)	38 (4.0)	31 (3.8)	8 (0.5)
Israel		10 (2.3)	26 (3.0)	32 (3.2)	33 (3.4)	9 (0.5)
Italy		18 (3.4)	23 (3.6)	28 (3.6)	30 (3.9)	10 (0.7)
Japan		0 (0.0)	8 (2.0)	38 (4.3)	54 (4.2)	5 (0.2)
Jordan		9 (2.1)	25 (2.9)	37 (3.6)	30 (3.6)	8 (0.5)
Kazakhstan		11 (2.2)	28 (3.7)	32 (4.1)	29 (3.9)	10 (0.7)
Korea, Rep. of		36 (4.4)	0 (0.0)	17 (2.9)	47 (4.5)	15 (1.5)
Kuwait		8 (2.6)	23 (3.4)	43 (4.3)	26 (3.3)	9 (0.7)
Lebanon		34 (4.9)	25 (3.9)	19 (3.7)	21 (4.0)	15 (1.1)
Lithuania		33 (4.1)	36 (3.9)	18 (3.5)	13 (3.0)	15 (0.9)
Malaysia		4 (1.5)	22 (3.0)	29 (4.1)	45 (4.7)	7 (0.5)
Malta		4 (0.0)	21 (0.1)	19 (0.1)	55 (0.1)	7 (0.0)
Morocco		1 (0.7)	20 (2.2)	38 (3.2)	40 (3.0)	7 (0.3)
New Zealand		12 (3.8)	36 (5.0)	33 (5.6)	19 (4.0)	11 (0.7)
Norway (9)		6 (2.1)	32 (4.3)	32 (4.7)	31 (4.4)	9 (0.6)
Oman		13 (2.3)	43 (4.1)	21 (2.9)	23 (2.9)	11 (0.5)
Qatar		12 (0.4)	27 (0.5)	40 (0.5)	21 (0.7)	10 (0.1)
Russian Federation		20 (3.7)	29 (3.9)	24 (3.3)	27 (3.7)	12 (0.8)
Saudi Arabia		9 (2.6)	33 (4.7)	17 (3.3)	40 (4.8)	9 (0.7)
Singapore		2 (0.0)	37 (0.0)	25 (0.0)	35 (0.0)	8 (0.0)
Slovenia		8 (2.1)	36 (4.1)	34 (4.4)	22 (3.7)	10 (0.5)
South Africa (9)		18 (2.6)	28 (2.8)	20 (2.9)	34 (3.5)	10 (0.7)
Sweden		7 (2.4)	34 (4.9)	28 (3.8)	31 (4.5)	9 (0.6)
Thailand		29 (3.3)	41 (3.6)	21 (2.9)	9 (1.8)	15 (0.7)
Turkey		8 (2.2)	23 (3.3)	21 (3.1)	48 (3.3)	7 (0.5)
United Arab Emirates		18 (1.5)	31 (1.6)	29 (2.0)	22 (2.1)	11 (0.3)
United States		7 (1.7)	19 (2.8)	31 (2.9)	44 (3.3)	7 (0.4)
International Avg.		12 (0.4)	27 (0.5)	29 (0.6)	32 (0.6)	9 (0.1)
Benchmarking Participants						
Buenos Aires, Argentina	s	9 (3.2)	14 (4.7)	27 (5.2)	49 (5.6)	7 (0.8)
Ontario, Canada		0 (0.0)	29 (4.8)	41 (5.2)	30 (5.1)	7 (0.5)
Quebec, Canada		1 (0.9)	36 (7.0)	24 (5.3)	38 (6.1)	8 (0.7)
Norway (8)		7 (2.5)	30 (4.2)	31 (4.6)	31 (4.5)	9 (0.7)
Abu Dhabi, UAE		15 (3.1)	43 (3.7)	20 (4.4)	21 (3.6)	11 (0.6)
Dubai, UAE		14 (0.2)	20 (0.3)	41 (0.3)	26 (0.3)	9 (0.0)
Florida, US	s	12 (6.1)	19 (7.0)	30 (8.2)	40 (6.2)	9 (1.7)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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TIMSS 2015

CHAPTER 9: CLASSROOM INSTRUCTION

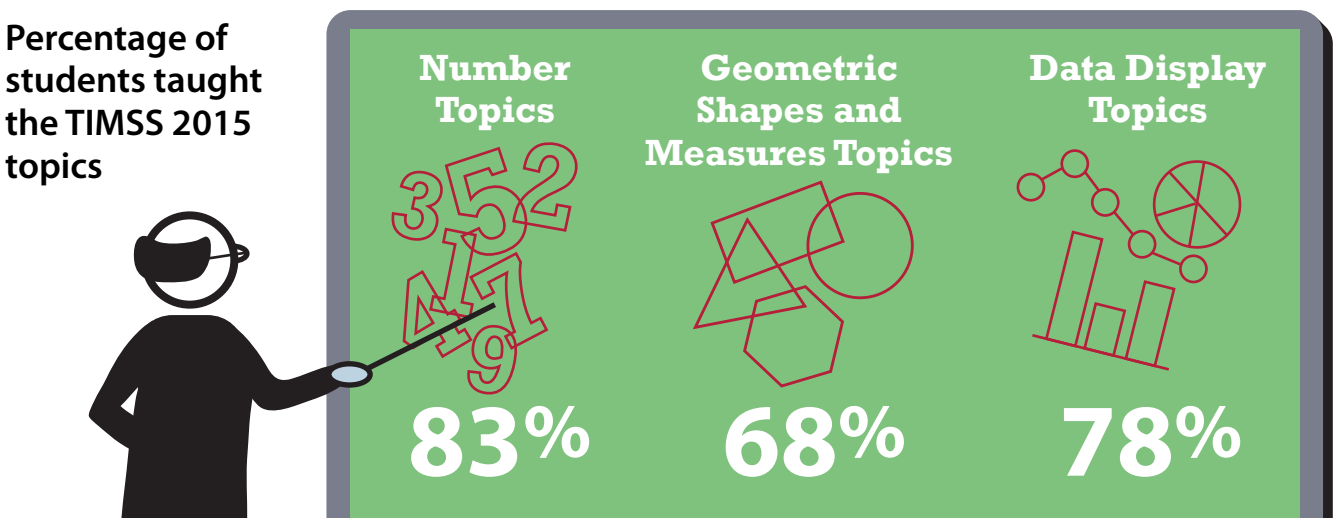
TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Instruction in Mathematics Classes

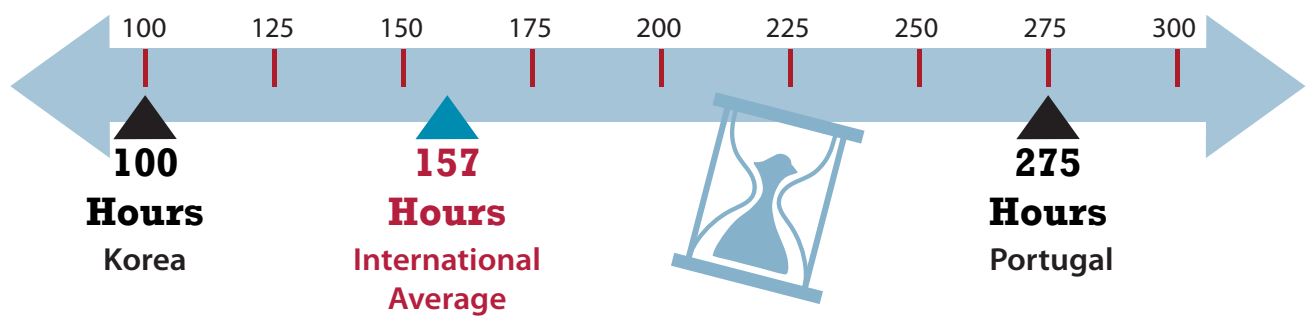
Curriculum Coverage

There was variation in topic coverage within content domains. However, according to their teachers most students had been taught the TIMSS topics.

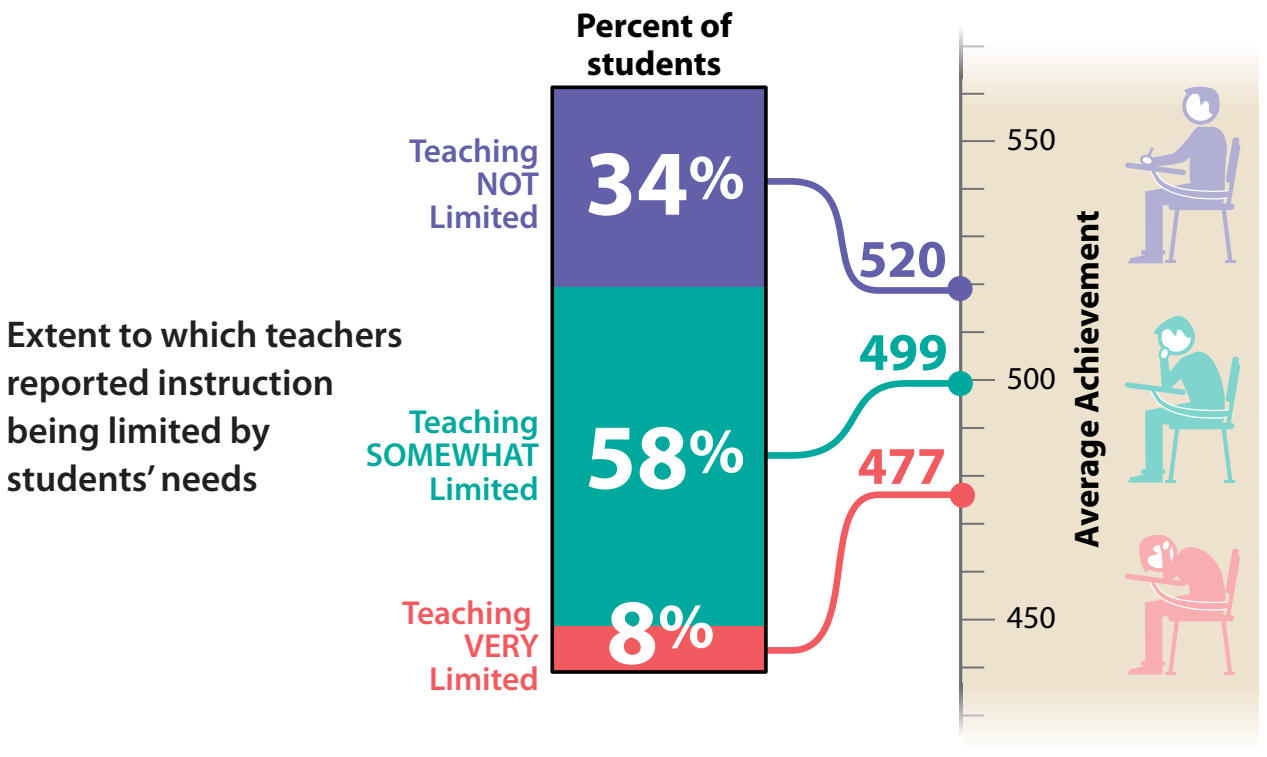


Instructional Time

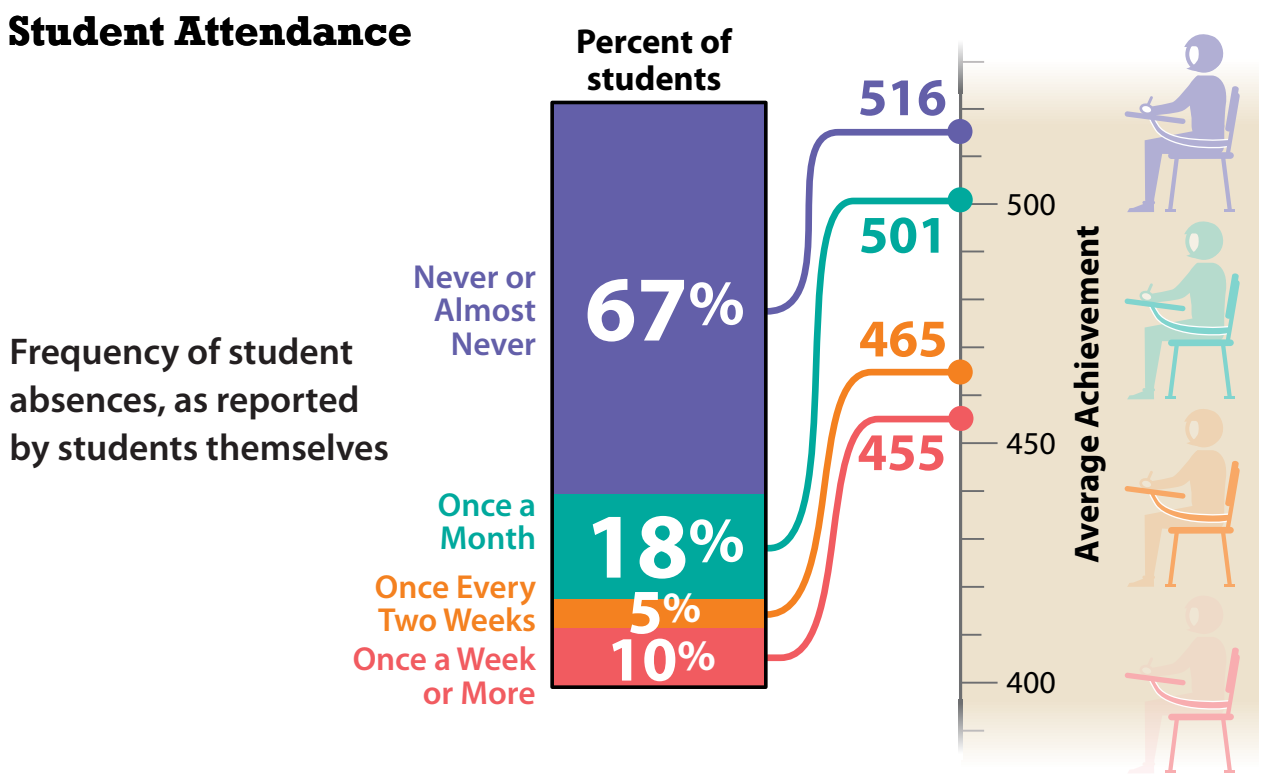
Instructional time remains a crucial resource in considering students' opportunity to learn, even though there are many factors that influence the effectiveness of an educational system. There was a considerable range in the yearly number of instructional hours in mathematics.



Teaching Limited by Student Needs



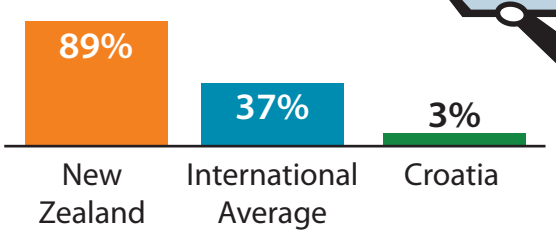
Student Attendance



Computer Activities During Mathematics Lessons

There is a continuing debate about the role of technology in education, and more particularly in mathematics classes.

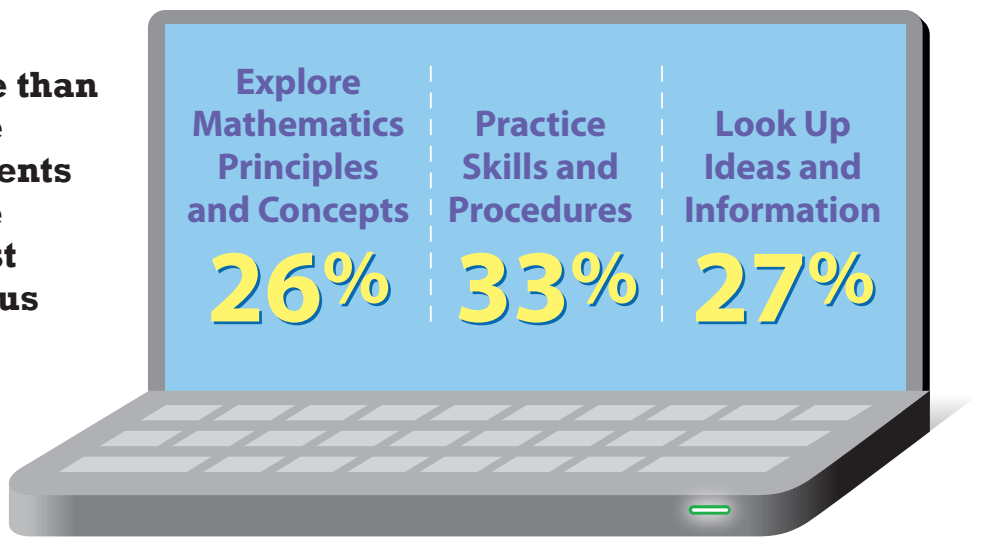
Teachers reported considerable variation in computer availability for use in mathematics lessons.



Average mathematics achievement for students with computer availability compared to those without availability:

510 vs 504

On average, more than one quarter of the fourth grade students were asked to use computers at least monthly for various activities.



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

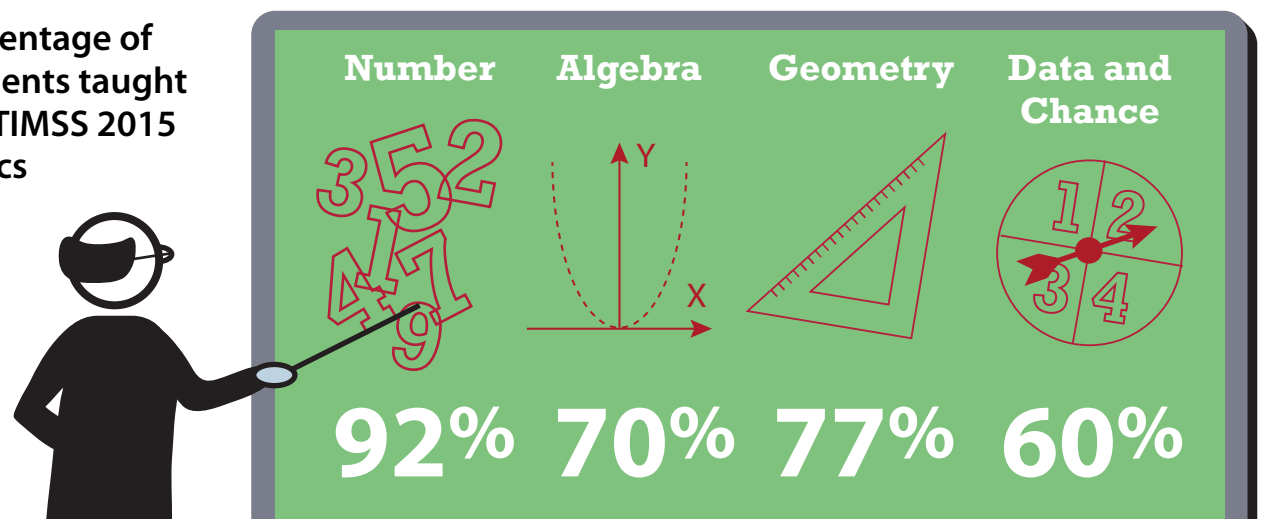
IEA TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Instruction in Mathematics Classes

Curriculum Coverage

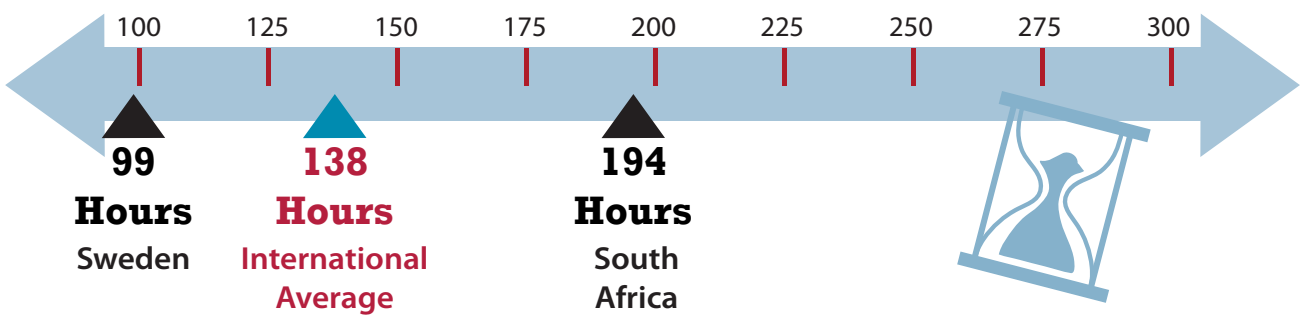
There was variation in topic coverage within content domains. However, according to their teachers many students had been taught the TIMSS topics, particularly those in Number.

Percentage of students taught the TIMSS 2015 topics



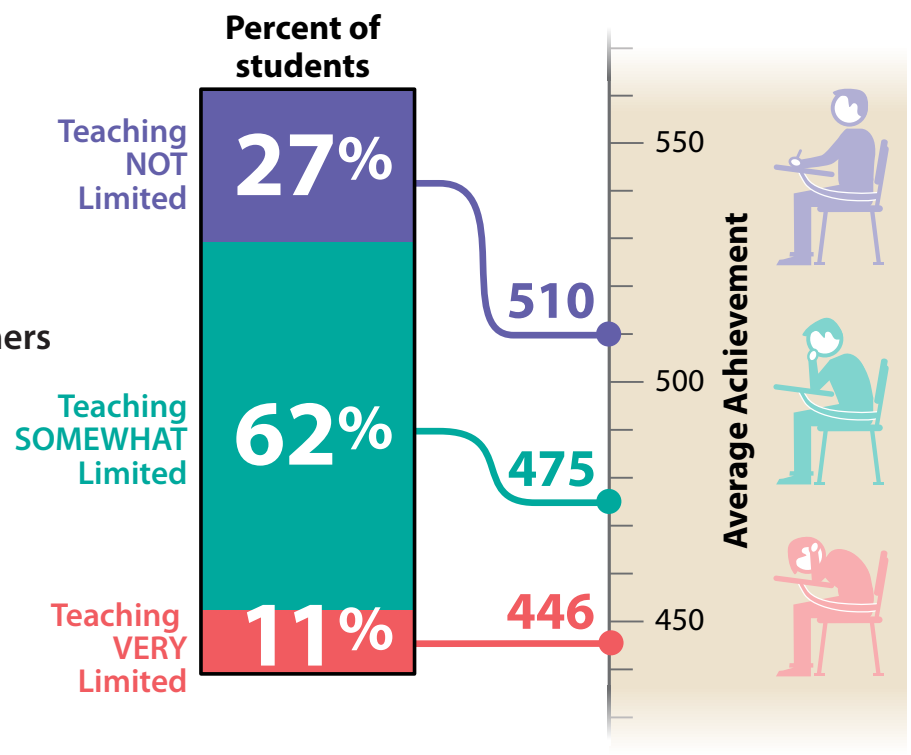
Instructional Time

Instructional time remains a crucial resource in considering students' opportunity to learn, even though there are many factors that influence the effectiveness of an educational system. There was a considerable range in the yearly number of instructional hours in mathematics.



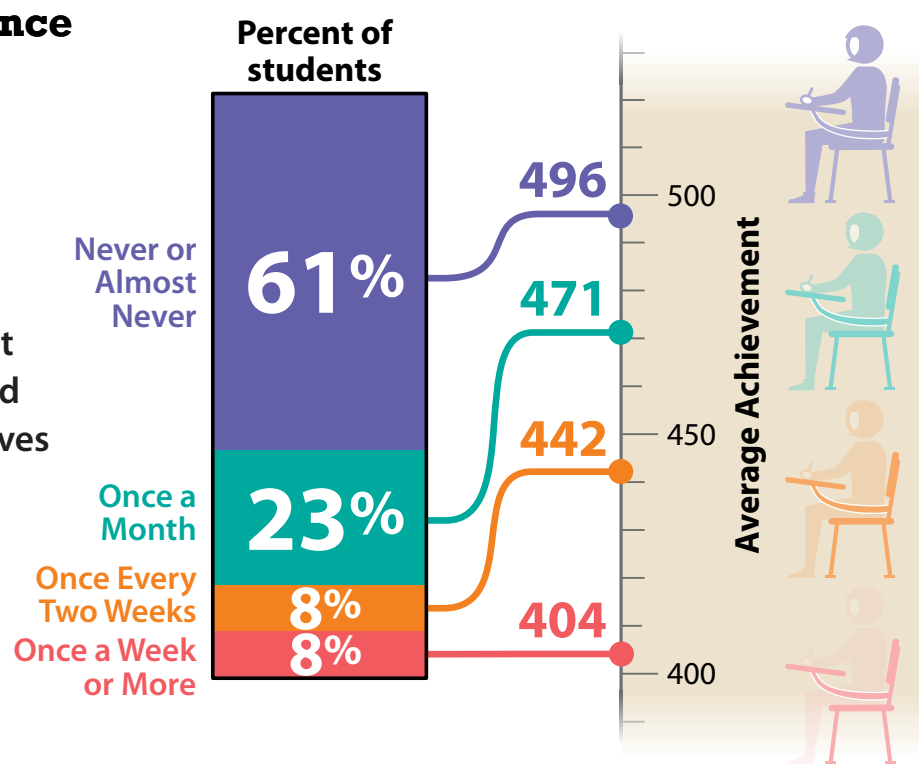
Teaching Limited by Student Needs

Extent to which teachers reported instruction being limited by students' needs



Student Attendance

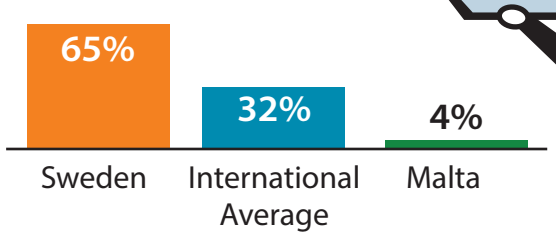
Frequency of student absences, as reported by students themselves



Computer Activities During Mathematics Lessons

There is a continuing debate about the role of technology in education, and more particularly in mathematics classes.

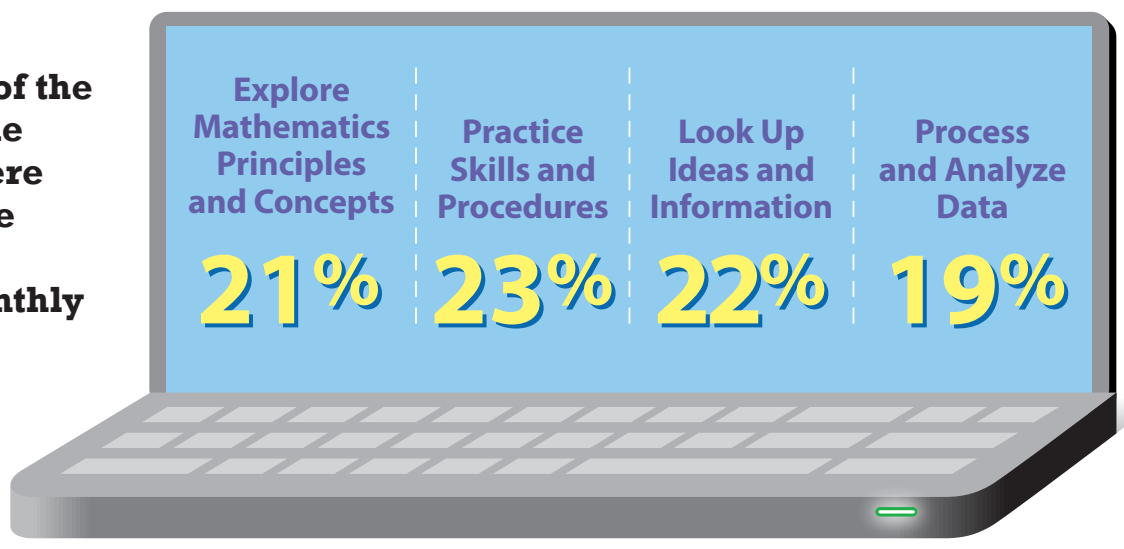
Teachers reported considerable variation in computer availability for use in mathematics lessons.



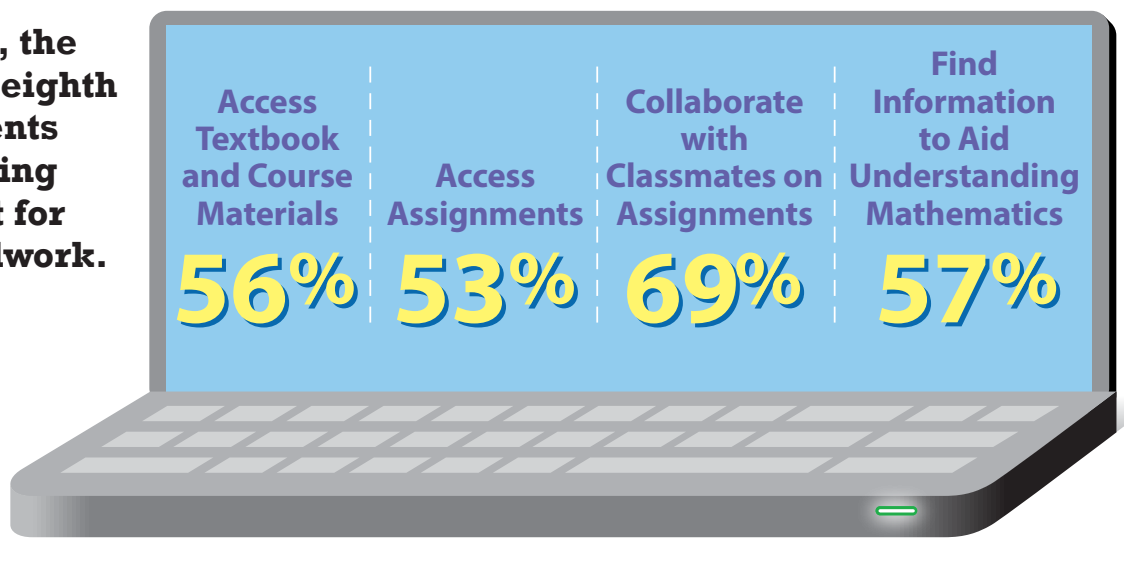
Average mathematics achievement for students with computer availability compared to those without availability:

485 VS 481

About 20% of the eighth grade students were asked to use computers at least monthly for various activities.



On average, the majority of eighth grade students reported using the Internet for their schoolwork.



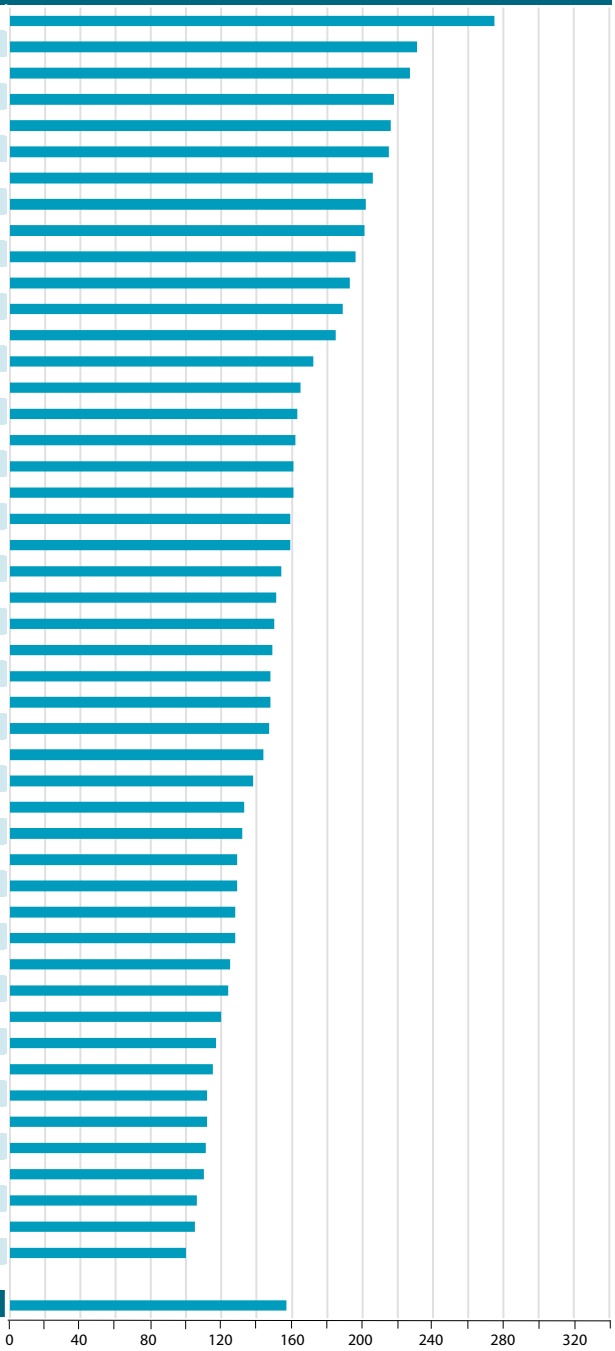
SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Exhibit 9.1: Instructional Time Spent on Mathematics

Reported by Principals and Teachers

Country		Total Instructional Hours per Year		Hours per Year for Mathematics Instruction
Portugal		864 (8.5)	r	275 (4.0)
Italy		1061 (20.5)	r	231 (4.5)
South Africa (5)	r	1199 (13.7)	s	227 (4.4)
Belgium (Flemish)	r	955 (11.6)	r	218 (3.2)
United States		1088 (9.2)	r	216 (4.1)
Northern Ireland	r	962 (10.2)	s	215 (6.5)
Chile	r	1094 (16.9)	s	206 (6.4)
Australia	r	1014 (8.4)	r	202 (3.5)
Singapore		986 (0.0)		201 (1.6)
Canada		951 (4.1)	r	196 (3.2)
France	r	858 (8.2)	r	193 (3.9)
England		994 (9.9)	r	189 (4.5)
Qatar	r	1056 (16.1)	r	185 (4.6)
Morocco	r	1054 (18.8)	r	172 (2.8)
Ireland		854 (0.0)		165 (2.4)
New Zealand		923 (5.5)	r	163 (2.3)
United Arab Emirates	r	1009 (4.6)	s	162 (2.4)
Cyprus	r	827 (12.4)	r	161 (5.5)
Spain		864 (10.2)		161 (2.3)
Bahrain		976 (0.6)	r	159 (2.9)
Hong Kong SAR		999 (13.1)		159 (4.7)
Serbia		737 (16.2)		154 (1.6)
Japan		903 (3.7)		151 (1.1)
Denmark	r	1051 (11.2)	s	150 (3.1)
Indonesia	r	1095 (20.9)	r	149 (5.0)
Oman	r	962 (11.7)	s	148 (4.5)
Saudi Arabia	r	1080 (19.6)	s	148 (4.5)
Germany	r	820 (9.1)	r	147 (2.0)
Slovenia	r	716 (7.2)	r	144 (1.2)
Georgia	r	743 (19.5)	r	138 (2.1)
Jordan		931 (14.2)		133 (3.3)
Kazakhstan		813 (16.2)		132 (3.8)
Slovak Republic		759 (8.1)		129 (2.1)
Hungary		784 (11.8)		129 (2.5)
Kuwait	s	912 (27.9)	s	128 (4.4)
Chinese Taipei		969 (14.4)	r	128 (4.3)
Czech Republic		771 (10.4)		125 (4.1)
Croatia		778 (21.6)		124 (1.8)
Turkey		847 (18.0)		120 (3.3)
Norway (5)		817 (8.7)	r	117 (2.4)
Finland		737 (8.9)		115 (2.2)
Poland	r	752 (6.9)	r	112 (1.1)
Iran, Islamic Rep. of	r	645 (6.4)	r	112 (2.3)
Lithuania		629 (5.5)		111 (1.6)
Sweden	r	839 (10.6)	r	110 (2.3)
Russian Federation		661 (6.9)		106 (1.4)
Bulgaria	r	707 (27.3)		105 (2.9)
Korea, Rep. of		712 (8.9)		100 (1.4)
Netherlands	s	1073 (16.2)		x x
International Avg.		894 (1.9)		157 (0.5)



SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students. An "x" indicates data are available for less than 50% of students.

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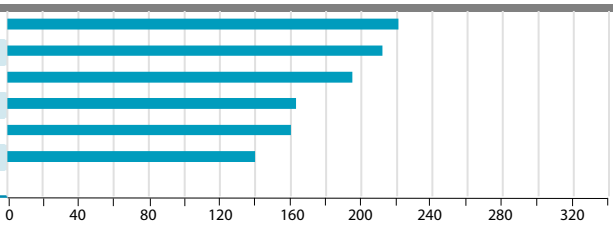
Exhibit 9.1: Instructional Time Spent on Mathematics (Continued)

Country		Total Instructional Hours per Year		Hours per Year for Mathematics Instruction
Benchmarking Participants				
Quebec, Canada		910 (8.0)		221 (8.9)
Florida, US	r	1075 (21.6)	s	212 (11.1)
Ontario, Canada		953 (6.2)	r	195 (3.2)
Abu Dhabi, UAE	r	1025 (11.1)	s	163 (4.5)
Dubai, UAE	r	996 (0.4)	s	160 (1.4)
Norway (4)		818 (9.9)	r	140 (4.3)
Buenos Aires, Argentina	s	951 (31.3)		x x



Total Instructional Hours per Year	=	Principal Reports of School Days per Year	x	Principal Reports of Instructional Hours per Day
Hours per Year for Mathematics Instruction	=	Teacher Reports of Weekly Mathematics Instructional Hours / Principal Reports of School Days per Week	x	Principal Reports of School Days per Year

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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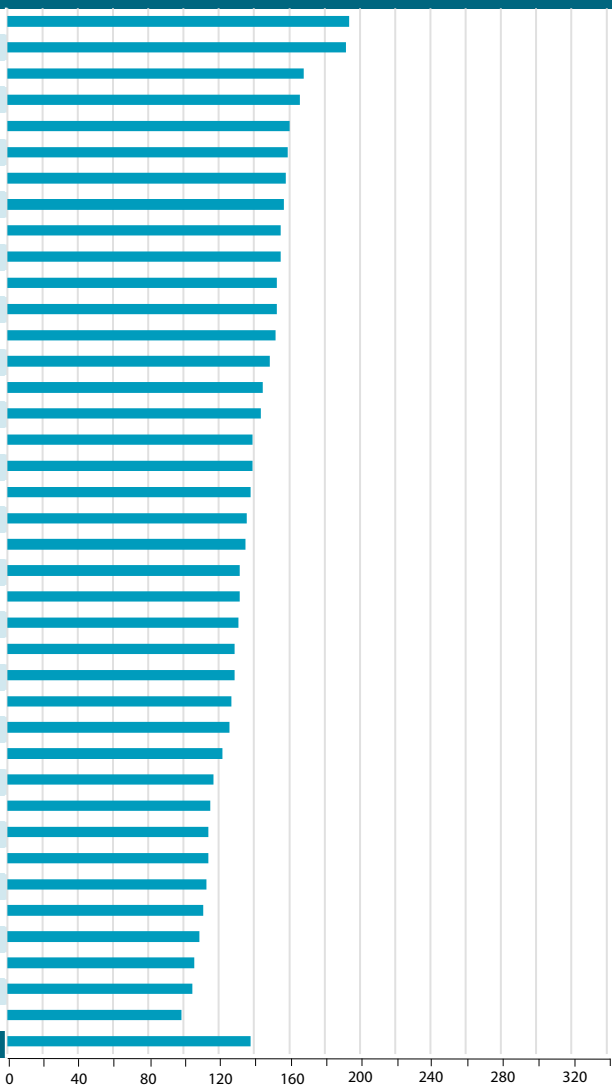
Exhibit 9.2: Instructional Time Spent on Mathematics

Reported by Principals and Teachers

Country	Total Instructional Hours per Year		Hours per Year for Mathematics Instruction	
South Africa (9)	s	1234 (19.8)	s	194 (4.2)
Chile	r	1127 (18.0)	s	192 (5.8)
Canada	r	949 (4.9)	r	168 (2.9)
Oman	r	980 (14.5)	s	166 (2.7)
Chinese Taipei		1132 (9.7)		160 (2.4)
United Arab Emirates	r	1016 (6.4)	s	159 (2.7)
Lebanon	r	945 (14.8)	r	158 (5.0)
Qatar	r	1085 (1.9)	r	157 (2.8)
United States		1135 (8.8)	r	155 (3.9)
Saudi Arabia		1112 (18.7)	r	155 (4.3)
Bahrain		1032 (1.0)		153 (2.3)
Israel	r	1133 (15.5)	r	153 (2.2)
Morocco		1364 (25.8)	r	152 (2.4)
Italy	r	1047 (9.6)		149 (2.9)
Russian Federation		884 (9.4)		145 (3.1)
New Zealand	r	966 (6.9)	r	144 (2.5)
Hong Kong SAR		995 (11.7)		139 (3.1)
Australia	r	1011 (6.3)	r	139 (2.0)
Botswana (9)	r	1107 (19.5)	r	138 (3.1)
Kuwait	r	997 (18.6)	r	136 (3.5)
Malaysia	r	1172 (15.6)		135 (4.1)
Egypt		1099 (21.2)		132 (3.3)
Jordan		976 (12.5)		132 (2.3)
Iran, Islamic Rep. of		971 (16.9)		131 (4.6)
Kazakhstan		933 (19.4)		129 (3.4)
Singapore		1065 (0.0)		129 (1.3)
Malta		964 (0.3)	r	127 (0.1)
England	r	1009 (8.3)	r	126 (3.4)
Georgia	r	864 (16.7)	r	122 (4.0)
Turkey		983 (22.6)		117 (2.7)
Lithuania		856 (10.2)		115 (1.7)
Slovenia	r	867 (10.3)	r	114 (1.3)
Korea, Rep. of		947 (6.0)		114 (1.2)
Hungary		842 (10.3)		113 (2.3)
Thailand		1209 (6.8)		111 (1.7)
Ireland	r	963 (3.2)		109 (0.8)
Japan		1036 (6.1)		106 (1.5)
Norway (9)		895 (8.8)	r	105 (2.2)
Sweden		921 (8.6)		99 (1.5)
International Avg.		1021 (2.1)		138 (0.5)



( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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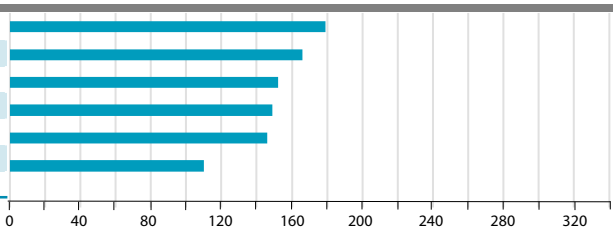
Exhibit 9.2: Instructional Time Spent on Mathematics (Continued)

Country		Total Instructional Hours per Year		Hours per Year for Mathematics Instruction
Benchmarking Participants				
Ontario, Canada	r	970 (6.0)	r	179 (3.8)
Abu Dhabi, UAE	r	1024 (11.0)	s	166 (5.2)
Dubai, UAE	r	1010 (1.3)	r	152 (1.7)
Quebec, Canada		906 (7.0)		149 (4.2)
Florida, US	s	1155 (39.9)	s	146 (9.0)
Norway (8)		888 (6.3)	r	110 (2.3)
Buenos Aires, Argentina	s	1164 (46.7)		x x



Total Instructional Hours per Year = Principal Reports of School Days per Year x Principal Reports of Instructional Hours per Day

Hours per Year for Mathematics Instruction = (Teacher Reports of Weekly Mathematics Instructional Hours / Principal Reports of School Days per Week) x Principal Reports of School Days per Year

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.3: Percentages of Students Taught the TIMSS Mathematics Topics*

Reported by Teachers

Country	All Mathematics (17 topics)	Number (8 topics)	Geometric Shapes and Measures (7 topics)	Data Display (2 topics)
Australia	87 (1.0)	89 (0.9)	83 (1.4)	93 (1.6)
Bahrain	86 (1.4)	87 (1.8)	82 (0.6)	90 (3.0)
Belgium (Flemish)	85 (0.7)	97 (0.7)	74 (1.2)	76 (2.6)
Bulgaria	60 (1.0)	63 (0.5)	56 (1.4)	62 (4.0)
Canada	77 (0.8)	80 (0.7)	69 (1.2)	92 (1.2)
Chile	90 (1.2)	94 (1.0)	88 (1.6)	83 (3.0)
Chinese Taipei	75 (1.0)	85 (0.9)	65 (1.2)	72 (3.5)
Croatia	60 (0.7)	61 (0.6)	67 (1.2)	30 (2.8)
Cyprus	83 (0.9)	84 (0.7)	80 (1.4)	89 (2.2)
Czech Republic	66 (1.0)	71 (1.0)	59 (1.4)	69 (3.1)
Denmark	77 (1.0)	78 (1.0)	79 (1.6)	62 (3.3)
England	89 (1.2)	95 (0.8)	85 (1.9)	80 (3.0)
Finland	76 (1.0)	89 (0.9)	58 (2.1)	85 (2.2)
France	75 (1.0)	75 (1.1)	77 (1.4)	71 (2.8)
Georgia	61 (1.5)	65 (1.3)	49 (2.3)	89 (2.2)
Germany	69 (0.8)	67 (1.0)	64 (1.3)	92 (1.7)
Hong Kong SAR	85 (0.9)	94 (0.8)	71 (1.5)	93 (2.1)
Hungary	75 (1.0)	79 (0.6)	68 (1.6)	85 (2.7)
Indonesia	74 (1.4)	89 (1.1)	65 (1.9)	42 (2.7)
Iran, Islamic Rep. of	76 (1.2)	93 (0.7)	60 (1.7)	61 (3.6)
Ireland	81 (1.0)	92 (0.8)	66 (1.7)	94 (1.9)
Italy	80 (1.0)	88 (1.0)	70 (1.6)	83 (2.5)
Japan	76 (1.0)	85 (0.8)	71 (1.2)	62 (3.2)
Jordan	72 (1.3)	89 (1.1)	59 (1.8)	52 (4.1)
Kazakhstan	79 (1.4)	82 (1.4)	80 (1.6)	65 (3.1)
Korea, Rep. of	73 (1.1)	83 (1.2)	60 (1.2)	80 (2.6)
Kuwait	84 (1.0)	90 (0.9)	74 (1.5)	89 (2.3)
Lithuania	81 (1.1)	88 (1.1)	69 (1.7)	95 (1.5)
Morocco	55 (0.9)	59 (1.1)	56 (1.2)	39 (3.1)
Netherlands	r 64 (1.4)	r 70 (1.5)	r 51 (1.8)	r 84 (2.8)
New Zealand	82 (0.9)	87 (0.8)	74 (1.3)	93 (1.4)
Northern Ireland	r 92 (0.9)	r 97 (0.6)	r 85 (1.7)	r 94 (2.7)
Norway (5)	r 74 (1.2)	r 78 (1.4)	r 70 (1.7)	r 74 (3.0)
Oman	91 (0.8)	97 (0.8)	83 (1.2)	96 (1.1)
Poland	58 (1.3)	71 (1.4)	46 (1.4)	47 (3.7)
Portugal	93 (0.5)	96 (0.5)	88 (1.0)	99 (0.4)
Qatar	75 (1.2)	91 (1.1)	57 (1.8)	75 (2.9)
Russian Federation	- -	- -	- -	- -
Saudi Arabia	82 (1.0)	89 (1.0)	73 (1.6)	84 (2.6)
Serbia	73 (0.8)	81 (0.6)	68 (1.0)	63 (3.6)
Singapore	85 (0.5)	100 (0.1)	66 (1.1)	95 (1.0)
Slovak Republic	56 (0.8)	66 (0.7)	44 (1.1)	57 (2.9)
Slovenia	64 (0.8)	70 (1.0)	48 (1.2)	95 (1.1)
South Africa (5)	90 (0.6)	95 (0.5)	82 (1.2)	95 (1.0)
Spain	74 (1.3)	86 (1.3)	58 (2.1)	83 (2.4)
Sweden	56 (1.3)	65 (1.5)	44 (2.0)	63 (4.3)
Turkey	78 (1.3)	84 (1.2)	65 (1.9)	96 (1.5)
United Arab Emirates	80 (0.7)	90 (0.6)	68 (1.3)	83 (2.0)
United States	83 (0.8)	94 (0.6)	69 (1.4)	86 (1.7)
International Avg.	76 (0.2)	83 (0.1)	68 (0.2)	78 (0.4)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

* Percentage mostly taught before or in the assessment year averaged across topics.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

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Exhibit 9.3: Percentages of Students Taught the TIMSS Mathematics Topics* (Continued)

Country	All Mathematics (17 topics)	Number (8 topics)	Geometric Shapes and Measures (7 topics)	Data Display (2 topics)
Benchmarking Participants				
Buenos Aires, Argentina	x x	x x	x x	x x
Ontario, Canada	r 80 (1.1)	r 77 (1.3)	r 78 (1.8)	r 99 (0.5)
Quebec, Canada	85 (1.4)	88 (1.4)	79 (1.9)	91 (3.1)
Norway (4)	72 (1.5)	71 (1.6)	74 (2.0)	71 (3.1)
Abu Dhabi, UAE	80 (1.7)	87 (1.2)	72 (2.5)	78 (3.9)
Dubai, UAE	83 (0.6)	92 (0.6)	71 (1.1)	90 (0.9)
Florida, US	r 86 (1.2)	r 97 (0.7)	r 71 (2.5)	r 90 (2.8)

TIMSS 2015 Mathematics Topics

A. Number

1) Concepts of whole numbers, including place value and ordering
2) Adding, subtracting, multiplying, and/or dividing with whole numbers
3) Concepts of multiples and factors; odd and even numbers
4) Concepts of fractions
5) Adding and subtracting with fractions, comparing and ordering fractions
6) Concepts of decimals, including place value and ordering, adding and subtracting with decimals
7) Number sentences
8) Number patterns

B. Geometric Shapes and Measures

1) Lines: measuring, estimating length of; parallel and perpendicular lines
2) Comparing and drawing angles
3) Using informal coordinate systems to locate points in a plane
4) Elementary properties of common geometric shapes
5) Reflections and rotations
6) Relationships between two-dimensional and three-dimensional shapes
7) Finding and estimating areas, perimeters, and volumes

C. Data Display

1) Reading and representing data from tables, pictographs, bar graphs, or pie charts
2) Drawing conclusions from data displays

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.4: Percentages of Students Taught the TIMSS Mathematics Topics*

Reported by Teachers

Country	All Mathematics (20 topics)	Number (5 topics)	Algebra (6 topics)	Geometry (6 topics)	Data and Chance (3 topics)
Australia	76 (0.9)	90 (0.9)	65 (1.5)	77 (1.4)	71 (2.2)
Bahrain	88 (0.5)	95 (0.5)	83 (0.7)	90 (0.8)	83 (1.6)
Botswana (9)	67 (1.5)	72 (2.4)	56 (2.4)	76 (1.8)	62 (3.2)
Canada	76 (0.8)	89 (0.8)	61 (1.2)	85 (1.3)	69 (1.9)
Chile	80 (1.5)	90 (1.3)	65 (2.4)	87 (1.6)	78 (3.4)
Chinese Taipei	72 (0.6)	95 (0.7)	88 (0.7)	72 (1.5)	2 (0.6)
Egypt	82 (0.7)	96 (0.6)	71 (1.3)	85 (0.9)	78 (2.0)
England	77 (1.3)	82 (1.0)	72 (1.9)	77 (2.2)	76 (2.2)
Georgia	71 (1.0)	96 (0.6)	72 (1.6)	61 (1.5)	45 (2.9)
Hong Kong SAR	73 (1.0)	93 (1.3)	72 (1.5)	79 (1.3)	33 (2.7)
Hungary	85 (0.7)	98 (0.4)	78 (1.0)	90 (0.9)	67 (2.7)
Iran, Islamic Rep. of	71 (0.9)	90 (1.0)	45 (1.3)	84 (1.1)	63 (2.8)
Ireland	73 (1.0)	92 (0.8)	72 (1.5)	58 (1.8)	75 (2.3)
Israel	82 (0.8)	90 (0.7)	90 (0.8)	78 (1.1)	59 (2.4)
Italy	75 (0.8)	99 (0.3)	49 (1.4)	92 (0.9)	56 (2.9)
Japan	88 (0.6)	81 (1.2)	91 (0.8)	95 (0.6)	79 (2.3)
Jordan	86 (0.8)	99 (0.6)	94 (0.8)	80 (1.5)	64 (2.6)
Kazakhstan	81 (0.9)	99 (0.2)	84 (1.4)	71 (1.3)	63 (2.7)
Korea, Rep. of	80 (0.6)	81 (0.7)	94 (0.6)	90 (0.9)	34 (3.1)
Kuwait	75 (1.1)	88 (0.9)	60 (1.6)	82 (1.5)	69 (2.5)
Lebanon	60 (1.3)	88 (1.0)	47 (1.7)	62 (1.7)	34 (3.3)
Lithuania	61 (1.0)	89 (0.8)	50 (1.5)	56 (1.5)	49 (2.5)
Malaysia	71 (1.3)	96 (0.7)	54 (2.1)	86 (1.3)	36 (3.4)
Malta	74 (0.0)	89 (0.0)	77 (0.1)	63 (0.1)	63 (0.1)
Morocco	60 (0.8)	96 (0.6)	50 (1.3)	54 (1.2)	29 (2.1)
New Zealand	75 (1.1)	87 (1.0)	69 (1.5)	69 (1.8)	76 (2.2)
Norway (9)	65 (0.8)	87 (1.0)	51 (1.7)	58 (1.6)	65 (2.5)
Oman	77 (0.8)	90 (0.7)	62 (1.1)	85 (1.1)	72 (1.9)
Qatar	80 (0.7)	89 (0.7)	77 (1.3)	84 (1.0)	66 (2.5)
Russian Federation	- -	- -	- -	- -	- -
Saudi Arabia	89 (0.8)	99 (0.5)	81 (1.5)	91 (1.0)	87 (2.1)
Singapore	88 (0.4)	98 (0.4)	94 (0.5)	80 (0.6)	77 (1.4)
Slovenia	60 (0.7)	97 (0.6)	49 (1.1)	63 (1.1)	14 (1.2)
South Africa (9)	80 (1.2)	97 (0.8)	80 (1.6)	81 (1.5)	49 (3.6)
Sweden	61 (1.3)	78 (1.4)	55 (2.7)	59 (1.7)	49 (2.6)
Thailand	70 (1.1)	99 (0.5)	54 (1.9)	80 (1.8)	31 (2.6)
Turkey	82 (0.7)	100 (0.2)	62 (1.7)	79 (1.0)	99 (0.6)
United Arab Emirates	84 (0.6)	92 (0.6)	79 (0.9)	84 (0.7)	78 (1.4)
United States	90 (0.7)	98 (0.4)	92 (0.8)	r 84 (1.3)	r 83 (2.0)
International Avg.	76 (0.1)	92 (0.1)	70 (0.2)	77 (0.2)	60 (0.4)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

* Percentage mostly taught before or in the assessment year averaged across topics.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

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Exhibit 9.4: Percentages of Students Taught the TIMSS Mathematics Topics* (Continued)

Country	All Mathematics (20 topics)	Number (5 topics)	Algebra (6 topics)	Geometry (6 topics)	Data and Chance (3 topics)
Benchmarking Participants					
Buenos Aires, Argentina	x x	x x	x x	x x	x x
Ontario, Canada	r 80 (1.1)	r 89 (1.2)	r 64 (1.5)	r 86 (1.8)	r 85 (1.9)
Quebec, Canada	72 (1.2)	89 (1.1)	57 (1.7)	87 (1.6)	45 (3.7)
Norway (8)	45 (1.1)	79 (1.5)	20 (1.7)	45 (2.0)	40 (2.8)
Abu Dhabi, UAE	83 (1.3)	91 (1.4)	79 (1.8)	r 85 (1.5)	73 (2.9)
Dubai, UAE	84 (0.7)	92 (0.6)	79 (1.0)	83 (0.9)	81 (2.1)
Florida, US	r 91 (1.5)	r 100 (0.3)	r 97 (1.0)	r 83 (3.9)	r 84 (4.3)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

TIMSS 2015 Mathematics Topics

A. Number
1) Computing with whole numbers
2) Comparing and ordering rational numbers
3) Computing with rational numbers
4) Concepts of irrational numbers
5) Problem solving involving percents or proportions

B. Algebra
1) Simplifying and evaluating algebraic expressions
2) Simple linear equations and inequalities
3) Simultaneous equations
4) Numeric, algebraic, and geometric patterns or sequences
5) Representation of functions as ordered pairs, tables, graphs, words, or equations
6) Properties of functions

C. Geometry
1) Geometric properties of angles and geometric shapes
2) Congruent figures and similar triangles
3) Relationship between three-dimensional shapes and their two-dimensional representations
4) Using appropriate measurement formulas for perimeters, circumferences, areas, surface areas, and volumes
5) Points on the Cartesian plane
6) Translation, reflection, and rotation

D. Data and Chance
1) Characteristics of data sets
2) Interpreting data sets
3) Judging, predicting, and determining the chances of possible outcomes

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Exhibit 9.5: Computer Activities During Mathematics Lessons

Reported by Teachers

Country	Computers Available for Students to Use in Mathematics Lessons			Percent of Students Whose Teachers Have Them Use Computers at Least Monthly		
	Percent of Students	Average Achievement				
	Yes	Yes	No	To Explore Mathematics Principles and Concepts	To Practice Skills and Procedures	To Look Up Ideas and Information
New Zealand	89 (1.6)	492 (2.6)	481 (8.7)	78 (2.3)	86 (2.0)	76 (2.3)
Denmark	84 (2.9)	537 (3.4)	540 (5.7)	52 (4.1)	79 (3.1)	45 (3.9)
Netherlands	r 76 (3.6)	531 (2.1)	527 (2.9)	r 48 (4.1)	r 73 (3.7)	r 49 (3.9)
Northern Ireland	r 71 (3.8)	573 (4.1)	572 (5.1)	r 58 (3.9)	r 68 (3.8)	r 58 (5.0)
Georgia	70 (3.6)	458 (4.3)	477 (8.1)	58 (4.6)	65 (4.1)	62 (4.4)
Sweden	65 (3.9)	522 (2.9)	514 (6.4)	33 (3.4)	63 (4.1)	33 (3.7)
Russian Federation	62 (3.6)	564 (4.8)	564 (4.8)	49 (4.1)	60 (3.7)	58 (4.0)
Australia	60 (3.8)	520 (3.5)	517 (6.2)	53 (3.8)	57 (3.9)	49 (3.8)
Norway (5)	59 (3.9)	551 (3.8)	548 (3.8)	44 (3.8)	54 (3.7)	40 (3.5)
England	58 (3.6)	551 (5.0)	542 (5.5)	49 (3.7)	52 (3.6)	45 (3.9)
Germany	57 (3.7)	518 (3.4)	524 (2.6)	23 (2.8)	43 (4.0)	29 (3.1)
Finland	56 (3.1)	536 (2.9)	534 (2.4)	32 (3.3)	50 (3.5)	30 (3.3)
Cyprus	51 (3.0)	523 (3.4)	523 (3.3)	42 (3.0)	49 (2.9)	38 (3.2)
Japan	50 (3.8)	590 (2.8)	596 (2.6)	10 (2.3)	14 (2.6)	12 (2.6)
United States	46 (3.2)	536 (3.8)	540 (3.3)	38 (3.0)	43 (3.2)	32 (2.5)
Canada	46 (2.7)	501 (4.1)	518 (2.9)	36 (2.6)	41 (2.6)	32 (2.5)
Hong Kong SAR	45 (4.4)	617 (4.5)	612 (4.7)	33 (4.9)	35 (4.4)	29 (4.4)
Chile	43 (4.2)	465 (5.2)	456 (3.7)	31 (3.8)	36 (4.2)	31 (4.1)
Kazakhstan	40 (3.7)	551 (7.2)	541 (6.2)	38 (3.9)	39 (3.8)	39 (3.8)
Ireland	40 (4.2)	548 (3.5)	547 (3.0)	31 (3.7)	34 (3.8)	27 (4.0)
Belgium (Flemish)	37 (3.4)	546 (3.4)	546 (2.9)	14 (2.2)	32 (3.4)	20 (2.9)
Singapore	37 (2.4)	621 (5.7)	616 (5.3)	30 (2.2)	34 (2.2)	28 (2.3)
Italy	35 (3.1)	506 (3.4)	507 (3.5)	25 (2.9)	29 (3.3)	25 (3.0)
Qatar	35 (3.4)	436 (8.4)	441 (4.9)	32 (3.5)	34 (3.3)	31 (3.3)
Spain	34 (3.4)	506 (4.1)	504 (2.9)	20 (3.0)	28 (3.4)	26 (3.2)
Poland	31 (3.7)	533 (3.6)	535 (2.9)	18 (3.2)	28 (3.6)	23 (3.7)
Jordan	31 (3.5)	405 (8.0)	382 (4.1)	25 (3.1)	28 (3.3)	27 (3.2)
Chinese Taipei	30 (3.9)	595 (3.3)	598 (2.3)	24 (3.3)	25 (3.4)	18 (3.2)
Lithuania	30 (3.9)	533 (6.2)	537 (3.4)	26 (3.7)	27 (3.7)	29 (3.9)
Turkey	30 (2.8)	503 (6.0)	474 (4.2)	25 (2.9)	26 (3.0)	27 (3.0)
Czech Republic	28 (3.3)	531 (4.4)	527 (2.4)	14 (2.4)	27 (3.2)	19 (2.8)
United Arab Emirates	26 (1.5)	483 (5.6)	443 (3.5)	23 (1.4)	24 (1.5)	23 (1.4)
Hungary	25 (3.1)	517 (8.6)	532 (4.0)	10 (2.3)	20 (2.9)	14 (2.8)
Bulgaria	25 (3.6)	530 (10.9)	523 (4.8)	11 (2.5)	21 (3.6)	23 (3.6)
Bahrain	24 (1.1)	461 (4.3)	446 (2.3)	19 (1.1)	17 (1.0)	20 (1.1)
Iran, Islamic Rep. of	24 (3.0)	444 (7.7)	429 (3.9)	17 (2.6)	19 (2.9)	17 (2.7)
Slovak Republic	22 (2.9)	502 (5.7)	497 (3.0)	19 (2.7)	21 (2.9)	21 (2.7)
Saudi Arabia	21 (3.1)	393 (10.3)	379 (4.5)	18 (2.9)	19 (3.0)	18 (2.9)
Portugal	20 (2.7)	540 (5.7)	542 (2.6)	13 (2.3)	15 (2.4)	17 (2.7)
France	19 (3.1)	506 (6.1)	484 (3.1)	3 (1.2)	9 (2.3)	6 (1.8)
Kuwait	16 (2.1)	353 (11.1)	352 (5.6)	12 (1.9)	12 (2.0)	13 (1.9)
Slovenia	16 (2.6)	517 (5.3)	521 (2.0)	9 (2.1)	12 (2.5)	12 (2.3)
Korea, Rep. of	14 (3.1)	611 (8.2)	608 (2.3)	7 (2.2)	8 (2.4)	8 (2.3)
Serbia	13 (2.6)	522 (7.4)	518 (3.8)	7 (1.6)	11 (2.3)	10 (2.3)
Oman	11 (1.9)	433 (9.7)	424 (2.9)	10 (1.8)	11 (1.9)	10 (1.9)
South Africa (5)	10 (2.1)	432 (15.7)	371 (4.3)	5 (1.6)	5 (1.3)	5 (1.4)
Indonesia	6 (1.4)	452 (14.9)	395 (3.8)	5 (1.3)	5 (1.2)	5 (1.1)
Morocco	4 (1.1)	403 (19.9)	375 (3.8)	2 (0.9)	2 (0.9)	2 (0.9)
Croatia	3 (1.3)	482 (10.3)	503 (1.8)	1 (0.7)	2 (1.0)	1 (0.8)
International Avg.	37 (0.5)	510 (1.0)	504 (0.6)	26 (0.4)	33 (0.4)	27 (0.4)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.5: Computer Activities During Mathematics Lessons (Continued)

Country	Computers Available for Students to Use in Mathematics Lessons			Percent of Students Whose Teachers Have Them Use Computers at Least Monthly		
	Percent of Students	Average Achievement				
	Yes	Yes	No	To Explore Mathematics Principles and Concepts	To Practice Skills and Procedures	To Look Up Ideas and Information
Benchmarking Participants						
Norway (4)	55 (4.0)	499 (3.6)	491 (3.1)	42 (4.3)	54 (4.0)	37 (4.3)
Ontario, Canada	50 (3.9)	512 (3.1)	515 (3.6)	38 (3.8)	42 (3.9)	34 (3.8)
Florida, US	r 47 (5.7)	553 (7.6)	542 (5.8)	r 39 (6.2)	r 44 (5.9)	r 39 (5.7)
Dubai, UAE	44 (2.3)	537 (4.1)	497 (3.5)	40 (2.3)	42 (2.2)	41 (2.2)
Quebec, Canada	25 (4.7)	537 (6.3)	535 (4.8)	17 (4.1)	24 (4.3)	18 (4.3)
Abu Dhabi, UAE	22 (3.2)	426 (12.2)	418 (6.6)	19 (3.0)	20 (3.0)	18 (2.9)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.6: Computer Activities During Mathematics Lessons

Reported by Teachers

Country	Computers Available for Students to Use in Mathematics Lessons			Percent of Students Whose Teachers Have Them Use Computers at Least Monthly			
	Percent of Students	Average Achievement					
	Yes	Yes	No	To Explore Mathematics Principles and Concepts	To Practice Skills and Procedures	To Look Up Ideas and Information	To Process and Analyze Data
Sweden	65 (3.6)	499 (4.0)	502 (4.0)	25 (3.7)	38 (4.0)	32 (4.2)	26 (3.9)
Australia	62 (3.4)	512 (3.5)	506 (5.4)	51 (3.5)	52 (3.6)	48 (3.6)	44 (3.2)
Kazakhstan	53 (3.9)	531 (7.6)	525 (7.4)	45 (4.5)	50 (4.1)	51 (4.2)	45 (4.5)
Canada	50 (3.3)	528 (3.7)	533 (3.2)	35 (2.8)	36 (3.1)	33 (3.0)	31 (3.1)
Chile	49 (4.6)	423 (5.5)	437 (5.8)	29 (4.3)	36 (4.4)	32 (4.5)	36 (4.3)
Egypt	48 (3.9)	395 (6.1)	390 (5.8)	35 (4.0)	42 (4.1)	45 (4.0)	32 (3.7)
Russian Federation	47 (3.5)	535 (5.1)	540 (6.4)	36 (3.5)	41 (3.6)	42 (3.2)	34 (3.5)
New Zealand	47 (3.5)	501 (4.8)	488 (5.7)	36 (3.3)	35 (3.3)	35 (3.3)	33 (3.5)
United Arab Emirates	44 (2.2)	481 (4.5)	456 (3.8)	38 (2.0)	40 (2.1)	40 (2.2)	37 (2.3)
Japan	43 (3.7)	585 (4.1)	588 (3.4)	3 (1.0)	6 (1.8)	4 (1.3)	5 (1.5)
Italy	43 (3.7)	493 (4.3)	495 (4.1)	28 (3.2)	29 (3.3)	31 (3.5)	26 (2.9)
Norway (9)	40 (3.9)	513 (3.5)	513 (3.2)	27 (3.9)	35 (4.1)	27 (4.0)	29 (3.8)
Jordan	39 (3.3)	394 (6.5)	378 (4.0)	29 (3.4)	28 (3.4)	32 (3.5)	25 (3.3)
Thailand	39 (4.5)	442 (8.5)	425 (6.1)	25 (4.0)	26 (4.2)	28 (4.3)	23 (4.1)
United States	39 (2.9)	519 (5.0)	518 (4.3)	r 27 (2.8)	r 31 (2.9)	r 29 (2.8)	r 26 (2.8)
Korea, Rep. of	39 (3.6)	604 (4.3)	607 (3.6)	25 (3.3)	22 (3.1)	24 (3.2)	19 (2.6)
Lithuania	38 (4.0)	508 (4.9)	512 (4.5)	21 (3.7)	24 (3.4)	29 (3.8)	23 (3.5)
Georgia	38 (3.6)	453 (6.6)	452 (4.5)	33 (3.8)	31 (3.5)	34 (3.8)	33 (3.7)
Qatar	36 (2.6)	422 (6.6)	445 (4.3)	31 (2.3)	33 (2.5)	30 (2.7)	26 (2.9)
Singapore	35 (2.5)	617 (6.0)	621 (4.1)	27 (2.2)	27 (2.3)	23 (2.0)	19 (2.0)
Hungary	30 (3.8)	509 (8.0)	516 (4.6)	20 (3.3)	27 (3.6)	22 (3.2)	18 (3.0)
Bahrain	30 (2.8)	458 (3.8)	452 (2.2)	23 (2.4)	23 (2.7)	24 (2.8)	16 (1.9)
England	29 (4.1)	511 (9.7)	520 (6.0)	17 (3.6)	23 (3.7)	17 (3.3)	13 (2.9)
Chinese Taipei	28 (3.5)	604 (6.8)	597 (2.9)	13 (2.8)	11 (2.6)	16 (2.8)	11 (2.5)
Iran, Islamic Rep. of	28 (3.0)	457 (8.6)	429 (5.1)	18 (2.7)	19 (2.8)	17 (2.8)	18 (2.7)
Ireland	25 (2.8)	515 (6.2)	525 (3.4)	11 (1.9)	12 (2.0)	10 (1.7)	10 (1.8)
Hong Kong SAR	21 (3.6)	591 (10.7)	596 (5.5)	13 (2.8)	12 (2.8)	13 (2.8)	12 (2.6)
Slovenia	19 (2.5)	517 (6.7)	516 (2.1)	12 (2.2)	14 (2.1)	13 (1.9)	13 (1.9)
Kuwait	19 (3.4)	393 (16.7)	393 (4.2)	14 (3.4)	17 (3.4)	17 (3.4)	15 (3.4)
Saudi Arabia	17 (2.9)	396 (12.7)	361 (4.6)	13 (2.9)	13 (2.8)	16 (3.0)	14 (3.1)
Israel	17 (2.4)	536 (11.8)	508 (4.3)	11 (2.0)	13 (2.2)	12 (2.1)	11 (1.9)
Turkey	16 (2.3)	471 (13.2)	456 (5.0)	13 (2.1)	11 (2.2)	15 (2.2)	12 (2.1)
Morocco	11 (2.2)	400 (6.9)	382 (2.6)	5 (1.4)	4 (1.4)	6 (1.6)	5 (1.4)
Malaysia	10 (2.0)	477 (11.7)	465 (4.6)	6 (1.5)	5 (1.7)	7 (1.5)	4 (1.3)
South Africa (9)	9 (1.7)	430 (12.4)	367 (4.9)	5 (1.4)	6 (1.6)	5 (1.4)	4 (1.5)
Oman	9 (1.8)	403 (9.9)	404 (3.1)	9 (1.8)	6 (1.5)	9 (1.7)	r 2 (0.6)
Lebanon	8 (2.3)	451 (11.8)	442 (3.9)	5 (2.0)	5 (1.8)	3 (1.1)	5 (1.8)
Botswana (9)	8 (2.4)	375 (6.1)	393 (2.4)	3 (1.5)	3 (1.7)	4 (1.7)	2 (1.4)
Malta	4 (0.0)	470 (5.4)	495 (1.1)	2 (0.0)	2 (0.0)	2 (0.0)	2 (0.0)
International Avg.	32 (0.5)	485 (1.3)	481 (0.7)	21 (0.5)	23 (0.5)	22 (0.5)	19 (0.5)
Benchmarking Participants							
Ontario, Canada	r 63 (5.1)	527 (4.7)	519 (4.3)	r 48 (4.2)	r 49 (4.7)	r 50 (4.6)	r 48 (5.0)
Dubai, UAE	63 (2.6)	524 (3.8)	499 (3.8)	58 (2.5)	60 (2.6)	60 (2.6)	55 (3.0)
Norway (8)	50 (4.0)	485 (3.1)	490 (2.8)	33 (3.7)	45 (4.0)	30 (3.7)	42 (4.1)
Abu Dhabi, UAE	r 30 (5.0)	468 (14.6)	431 (8.0)	r 24 (4.2)	r 27 (4.8)	r 27 (4.8)	r 24 (4.6)
Florida, US	r 28 (5.1)	483 (15.9)	513 (8.3)	r 21 (4.9)	r 28 (5.1)	r 16 (5.3)	r 21 (4.9)
Quebec, Canada	20 (2.5)	556 (6.2)	548 (3.8)	12 (2.3)	13 (2.5)	6 (1.7)	6 (1.4)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.7: Student Use of Internet for Schoolwork

Reported by Students

Country	Percent of Students Who Use the Internet to Do the Following Tasks				
	Access the Textbook or Other Course Materials	Access Assignments Posted Online by the Teacher	Collaborate with Classmates on Assignments or Projects	Communicate with the Teacher	Find Information, Articles, or Tutorials to Aid in Understanding Mathematics
Australia	55 (1.4)	66 (1.2)	63 (0.8)	46 (1.1)	57 (1.0)
Bahrain	56 (1.0)	43 (1.1)	77 (0.8)	41 (1.1)	58 (0.8)
Botswana (9)	46 (0.8)	37 (1.0)	58 (1.1)	36 (0.8)	54 (0.8)
Canada	45 (1.5)	58 (2.0)	76 (1.0)	32 (1.2)	56 (1.2)
Chile	62 (1.0)	37 (1.4)	79 (0.9)	25 (1.2)	60 (1.0)
Chinese Taipei	74 (0.9)	50 (1.1)	72 (1.0)	28 (1.0)	38 (0.8)
Egypt	57 (1.1)	34 (1.0)	58 (1.0)	56 (1.2)	64 (1.0)
England	54 (1.5)	71 (1.4)	53 (1.4)	33 (1.9)	66 (1.1)
Georgia	76 (1.3)	44 (1.5)	73 (1.3)	31 (1.4)	47 (1.2)
Hong Kong SAR	51 (1.3)	64 (1.9)	76 (1.3)	33 (1.2)	61 (1.1)
Hungary	40 (1.1)	58 (1.2)	76 (1.1)	26 (1.3)	41 (1.1)
Iran, Islamic Rep. of	60 (1.4)	40 (1.1)	56 (1.2)	31 (1.0)	52 (1.2)
Ireland	34 (1.2)	35 (2.6)	50 (1.2)	12 (1.2)	44 (1.0)
Israel	64 (1.2)	68 (1.4)	60 (1.2)	32 (1.3)	55 (0.9)
Italy	50 (1.1)	34 (2.1)	75 (1.1)	27 (1.5)	41 (1.0)
Japan	23 (0.8)	16 (0.9)	28 (1.0)	5 (0.5)	30 (0.8)
Jordan	65 (1.1)	42 (1.2)	70 (1.3)	49 (1.2)	61 (1.0)
Kazakhstan	65 (1.1)	39 (1.5)	76 (0.9)	24 (1.3)	66 (0.9)
Korea, Rep. of	51 (1.0)	43 (1.3)	69 (1.1)	13 (0.7)	45 (0.9)
Kuwait	x x	x x	x x	x x	x x
Lebanon	57 (1.3)	43 (1.7)	77 (1.5)	42 (1.7)	58 (1.3)
Lithuania	52 (1.0)	83 (1.0)	84 (0.7)	29 (1.1)	62 (1.2)
Malaysia	60 (1.1)	27 (1.1)	80 (1.0)	45 (1.2)	63 (1.1)
Malta	45 (0.8)	65 (0.6)	80 (0.6)	35 (0.8)	58 (0.8)
Morocco	47 (1.1)	64 (1.1)	36 (1.2)	64 (1.1)	41 (1.2)
New Zealand	48 (1.4)	61 (2.2)	60 (1.5)	38 (1.8)	59 (1.0)
Norway (9)	52 (1.3)	86 (1.2)	81 (1.1)	34 (1.7)	64 (1.1)
Oman	68 (0.9)	47 (1.0)	80 (0.7)	39 (1.0)	71 (1.0)
Qatar	59 (1.0)	61 (0.8)	66 (0.7)	43 (0.9)	61 (0.9)
Russian Federation	68 (1.0)	49 (1.9)	82 (0.9)	29 (1.5)	72 (1.1)
Saudi Arabia	44 (1.3)	55 (1.8)	39 (1.9)	57 (1.8)	42 (1.4)
Singapore	57 (0.7)	90 (0.5)	84 (0.7)	49 (0.6)	61 (0.7)
Slovenia	68 (1.6)	62 (1.7)	70 (1.2)	27 (1.3)	53 (1.2)
South Africa (9)	59 (1.1)	40 (1.3)	72 (1.1)	43 (1.4)	63 (1.0)
Sweden	67 (1.4)	81 (1.7)	71 (1.5)	47 (1.7)	54 (1.3)
Thailand	81 (0.9)	56 (1.7)	88 (0.7)	46 (1.5)	70 (1.0)
Turkey	54 (0.9)	24 (0.8)	75 (0.9)	19 (0.7)	66 (1.0)
United Arab Emirates	70 (0.6)	69 (0.9)	83 (0.6)	44 (0.8)	69 (0.5)
United States	52 (1.4)	64 (1.7)	61 (1.0)	40 (1.4)	63 (0.8)
International Avg.	56 (0.2)	53 (0.2)	69 (0.2)	36 (0.2)	57 (0.2)
Benchmarking Participants					
Buenos Aires, Argentina	55 (1.5)	56 (2.0)	75 (1.2)	25 (1.7)	50 (1.4)
Ontario, Canada	48 (2.1)	60 (2.6)	77 (1.1)	35 (1.9)	59 (1.4)
Quebec, Canada	43 (1.7)	58 (3.0)	77 (1.3)	28 (1.4)	52 (1.9)
Norway (8)	52 (1.3)	86 (1.2)	72 (1.2)	28 (1.6)	64 (0.9)
Abu Dhabi, UAE	70 (1.2)	58 (2.0)	84 (0.9)	42 (1.6)	69 (0.9)
Dubai, UAE	71 (0.9)	84 (0.6)	83 (0.8)	46 (0.9)	74 (0.8)
Florida, US	63 (2.1)	71 (2.2)	56 (2.1)	42 (2.9)	68 (1.2)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
An "x" indicates data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit 9.8: Weekly Time Students Spend on Assigned Mathematics Homework

Reported by Students

Country	3 Hours or More		More than 45 Minutes but Less than 3 Hours		45 Minutes or Less	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Russian Federation	43 (1.3)	532 (4.7)	43 (1.1)	543 (4.7)	14 (0.9)	543 (7.4)
Kazakhstan	41 (1.2)	536 (6.3)	40 (0.9)	531 (5.9)	19 (1.0)	509 (7.7)
South Africa (9)	34 (1.1)	382 (5.0)	38 (0.8)	389 (5.3)	28 (0.9)	348 (5.0)
Georgia	28 (1.3)	470 (5.5)	39 (1.1)	470 (4.0)	32 (1.2)	435 (4.5)
Italy	23 (1.0)	488 (3.6)	54 (1.0)	502 (2.8)	23 (1.1)	486 (4.4)
Thailand	23 (1.2)	454 (5.1)	49 (1.0)	439 (5.0)	28 (1.4)	402 (5.3)
Singapore	22 (0.8)	633 (3.1)	55 (0.9)	631 (3.0)	23 (0.9)	586 (5.7)
Botswana (9)	22 (0.9)	397 (3.3)	39 (0.7)	410 (2.4)	39 (1.1)	376 (2.7)
Slovenia	21 (1.2)	505 (4.0)	44 (1.1)	518 (2.6)	35 (1.5)	524 (2.9)
Hong Kong SAR	21 (1.4)	596 (4.7)	45 (1.6)	604 (4.6)	34 (1.8)	582 (7.0)
Israel	20 (1.2)	549 (4.1)	38 (0.9)	526 (3.8)	42 (1.4)	484 (5.6)
Canada	19 (1.0)	529 (3.1)	42 (1.1)	534 (2.4)	39 (1.4)	524 (2.7)
Lithuania	19 (1.1)	501 (5.3)	45 (1.2)	512 (3.6)	36 (1.4)	517 (3.5)
Ireland	19 (1.0)	531 (4.2)	49 (1.0)	533 (2.6)	32 (1.2)	507 (4.5)
Malta	18 (0.6)	513 (2.8)	44 (0.8)	516 (1.8)	38 (0.7)	472 (2.2)
United States	18 (1.0)	547 (5.0)	36 (0.9)	530 (3.2)	46 (1.5)	502 (3.2)
Malaysia	17 (0.7)	467 (3.7)	51 (1.0)	478 (3.4)	31 (1.0)	452 (5.2)
Chinese Taipei	15 (1.1)	608 (6.0)	44 (1.0)	613 (2.7)	41 (1.4)	582 (3.4)
Lebanon	14 (1.0)	436 (5.4)	32 (1.3)	456 (4.8)	54 (1.5)	442 (4.0)
Iran, Islamic Rep. of	13 (0.6)	448 (7.0)	46 (0.9)	452 (4.8)	42 (1.1)	418 (4.8)
Turkey	12 (1.0)	453 (8.1)	42 (1.4)	470 (5.9)	46 (1.8)	454 (5.1)
Morocco	11 (0.5)	381 (4.0)	29 (0.7)	397 (3.0)	60 (0.8)	385 (2.3)
Hungary	11 (0.7)	513 (5.5)	38 (1.1)	523 (4.6)	51 (1.5)	510 (4.7)
Qatar	10 (0.6)	451 (6.3)	32 (0.9)	463 (4.1)	58 (0.8)	424 (3.3)
Egypt	10 (0.5)	380 (6.2)	24 (0.8)	406 (4.7)	66 (1.0)	397 (4.3)
United Arab Emirates	10 (0.5)	463 (4.9)	31 (0.8)	487 (3.2)	59 (1.0)	457 (2.3)
Australia	9 (0.8)	530 (5.6)	35 (1.2)	527 (3.4)	56 (1.6)	491 (3.7)
Norway (9)	9 (1.0)	492 (4.2)	50 (1.3)	514 (2.7)	41 (1.5)	515 (3.0)
Jordan	9 (0.5)	357 (5.6)	30 (0.8)	394 (3.4)	62 (0.8)	391 (3.5)
Bahrain	8 (0.6)	440 (7.3)	22 (0.8)	456 (3.9)	70 (1.0)	458 (1.7)
Saudi Arabia	7 (0.5)	335 (8.8)	17 (0.9)	374 (8.6)	76 (1.1)	372 (4.5)
Oman	6 (0.4)	380 (7.9)	17 (0.6)	405 (4.5)	78 (0.7)	408 (2.5)
Kuwait	6 (0.8)	375 (12.7)	18 (0.9)	404 (9.3)	76 (1.2)	392 (4.4)
Chile	4 (0.5)	425 (6.1)	28 (1.4)	432 (4.2)	67 (1.6)	428 (3.5)
New Zealand	4 (0.4)	500 (8.8)	28 (1.3)	517 (3.9)	68 (1.5)	485 (3.3)
Japan	3 (0.5)	588 (15.1)	25 (1.4)	583 (3.8)	72 (1.6)	592 (2.5)
Korea, Rep. of	3 (0.3)	604 (11.3)	16 (0.9)	600 (4.3)	81 (1.0)	607 (2.8)
Sweden	2 (0.3)	~ ~	19 (1.2)	486 (4.7)	80 (1.4)	508 (2.7)
England	1 (0.2)	~ ~	26 (1.1)	539 (5.0)	73 (1.2)	514 (4.3)
International Avg.	15 (0.1)	481 (1.1)	36 (0.2)	491 (0.7)	49 (0.2)	474 (0.7)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report achievement.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.8: Weekly Time Students Spend on Assigned Mathematics Homework (Continued)

Country	3 Hours or More		More than 45 Minutes but Less than 3 Hours		45 Minutes or Less	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Benchmarking Participants						
Quebec, Canada	27 (2.1)	543 (4.3)	45 (1.3)	549 (3.5)	29 (1.8)	546 (4.4)
Florida, US	17 (1.9)	531 (8.5)	38 (1.6)	510 (5.8)	45 (2.7)	472 (7.7)
Ontario, Canada	16 (1.2)	519 (4.6)	42 (1.6)	530 (3.0)	42 (2.0)	520 (3.5)
Buenos Aires, Argentina	16 (1.3)	403 (7.4)	39 (1.4)	408 (4.9)	46 (2.0)	387 (6.1)
Dubai, UAE	11 (0.7)	507 (7.9)	38 (0.7)	528 (3.1)	51 (0.8)	503 (2.4)
Norway (8)	9 (0.9)	472 (4.7)	47 (1.3)	489 (2.3)	44 (1.8)	490 (2.7)
Abu Dhabi, UAE	9 (0.8)	439 (11.9)	28 (2.0)	466 (8.8)	63 (2.4)	435 (4.4)

A. How often does your teacher give you homework in mathematics?

1) Every day
2) 3 or 4 times a week
3) 1 or 2 times a week
4) Less than once a week
5) Never

B. When your teacher gives you homework in mathematics, about how many minutes do you usually spend on your homework?

1) My teacher never gives me homework
2) 1-15 minutes
3) 16-30 minutes
4) 31-60 minutes
5) 61-90 minutes
6) More than 90 minutes

The weekly time spent on mathematics homework was calculated by multiplying how often students were given homework weekly by the minutes they spent on that homework.

The values for Part A were: Every day = 5; 3 or 4 times a week = 3.5; 1 or 2 times a week = 1.5; Less than once a week = 0.5; and Never = 0.

The values for Part B were: My teacher never gives me homework = 0; 1-15 minutes = 8; 16-30 minutes = 23; 31-60 minutes = 45; 61-90 minutes = 75; and More than 90 minutes = 105.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.9: Teaching Limited by Student Needs

Reported by Teachers

Students were scored according to their teachers' responses concerning six needs on the *Teaching Limited by Student Needs* scale. Students with teachers who felt **Not Limited** by student needs had a score on the scale of at least 11.0, which corresponds to their teachers feeling "not at all" limited by three of the six needs and to "some" extent limited by the other three needs, on average. Students with teachers who felt **Very Limited** by student needs had a score no higher than 6.9, which corresponds to their teachers reporting feeling limited "a lot" by three of the six needs and to "some" extent limited by the other three needs, on average. All other students had teachers who felt **Somewhat Limited** by student needs.

Country	Not Limited		Somewhat Limited		Very Limited		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Japan	71 (3.0)	595 (2.1)	28 (3.0)	586 (2.9)	1 (0.6)	~ ~	11.8 (0.13)
Indonesia	58 (3.0)	407 (4.8)	42 (2.9)	385 (6.7)	0 (0.3)	~ ~	10.8 (0.09)
Czech Republic	57 (3.3)	534 (3.0)	42 (3.3)	520 (3.7)	0 (0.3)	~ ~	11.1 (0.11)
Slovak Republic	54 (2.8)	509 (3.2)	38 (2.9)	487 (4.6)	8 (1.8)	477 (13.9)	10.8 (0.13)
Serbia	51 (4.0)	521 (4.5)	45 (4.1)	514 (6.4)	4 (1.6)	526 (10.5)	10.6 (0.15)
Belgium (Flemish)	49 (3.4)	554 (3.0)	49 (3.4)	538 (3.1)	2 (0.7)	~ ~	10.6 (0.11)
Poland	48 (3.3)	543 (3.1)	50 (3.2)	528 (3.0)	1 (0.6)	~ ~	10.6 (0.11)
Ireland	48 (3.8)	559 (2.9)	48 (3.8)	538 (3.1)	4 (1.6)	516 (9.5)	10.7 (0.14)
Hong Kong SAR	47 (4.0)	628 (4.8)	51 (4.0)	602 (4.7)	2 (1.1)	~ ~	10.7 (0.12)
Kazakhstan	47 (3.5)	557 (6.1)	45 (4.0)	533 (6.6)	8 (2.1)	537 (14.8)	10.3 (0.15)
Norway (5)	47 (4.2)	554 (3.9)	50 (4.2)	547 (2.6)	4 (1.5)	527 (7.2)	10.5 (0.15)
Singapore	44 (3.0)	649 (4.5)	52 (2.9)	598 (5.4)	4 (1.0)	538 (18.0)	10.4 (0.11)
Finland	44 (3.4)	545 (2.8)	54 (3.4)	528 (2.2)	2 (0.9)	~ ~	10.6 (0.10)
Spain	44 (3.6)	515 (2.3)	53 (3.7)	499 (4.1)	3 (1.3)	460 (8.4)	10.3 (0.14)
Northern Ireland r	43 (4.5)	592 (4.1)	55 (4.6)	558 (4.3)	2 (1.1)	~ ~	10.5 (0.16)
Bulgaria	41 (3.8)	534 (5.9)	55 (3.4)	519 (7.2)	4 (1.4)	504 (14.7)	10.4 (0.12)
Sweden	41 (3.9)	534 (4.0)	55 (3.8)	508 (3.9)	5 (1.6)	520 (7.9)	10.3 (0.16)
Hungary	39 (4.0)	544 (6.5)	56 (4.0)	521 (5.0)	4 (1.2)	471 (20.1)	10.3 (0.14)
Korea, Rep. of	39 (3.8)	612 (3.9)	53 (3.7)	604 (2.9)	8 (1.9)	615 (5.9)	10.2 (0.16)
Croatia	39 (3.7)	505 (3.4)	56 (3.6)	502 (2.6)	5 (1.8)	493 (5.5)	10.2 (0.16)
Georgia	38 (4.1)	480 (6.6)	59 (4.2)	455 (4.7)	2 (1.2)	~ ~	10.3 (0.14)
England	38 (4.3)	568 (6.8)	58 (4.2)	537 (3.9)	5 (2.0)	510 (8.7)	10.3 (0.17)
Germany	36 (3.2)	530 (2.7)	59 (3.4)	519 (2.9)	5 (1.5)	481 (7.8)	10.0 (0.11)
New Zealand	36 (2.6)	520 (3.8)	58 (2.8)	479 (3.3)	6 (1.4)	436 (10.3)	10.1 (0.10)
United Arab Emirates	35 (2.4)	486 (5.7)	61 (2.5)	441 (4.0)	4 (0.7)	370 (7.1)	10.1 (0.08)
Netherlands r	34 (4.7)	539 (2.9)	62 (5.1)	526 (2.2)	4 (1.8)	514 (10.5)	10.0 (0.14)
Australia	34 (3.4)	547 (5.3)	58 (3.3)	508 (3.3)	8 (3.0)	474 (13.0)	9.9 (0.15)
Italy	33 (3.3)	517 (4.9)	54 (3.8)	501 (2.9)	14 (2.7)	503 (6.4)	9.7 (0.15)
Denmark	32 (4.0)	550 (5.6)	61 (4.0)	533 (3.6)	6 (1.6)	520 (11.5)	9.9 (0.15)
Qatar	31 (2.8)	462 (7.4)	67 (3.0)	430 (4.2)	2 (1.1)	~ ~	10.1 (0.11)
Lithuania	28 (3.4)	547 (4.3)	62 (3.5)	530 (3.8)	10 (1.6)	541 (8.9)	9.5 (0.12)
Bahrain	27 (1.5)	458 (3.8)	63 (2.4)	452 (2.0)	9 (1.8)	431 (5.6)	9.6 (0.10)
Russian Federation	27 (3.6)	576 (6.1)	58 (4.0)	563 (5.0)	15 (2.7)	545 (10.1)	9.3 (0.15)
Portugal	26 (3.4)	557 (5.5)	63 (3.6)	537 (3.5)	12 (2.1)	530 (7.1)	9.5 (0.14)
Oman	26 (2.8)	418 (6.2)	55 (3.4)	430 (3.9)	19 (2.5)	429 (6.3)	9.1 (0.14)
Cyprus	24 (3.2)	534 (3.7)	60 (3.4)	521 (3.3)	17 (2.4)	513 (5.9)	9.1 (0.14)
Canada	22 (2.0)	531 (3.7)	69 (2.1)	511 (2.0)	9 (1.4)	460 (12.7)	9.5 (0.10)
Iran, Islamic Rep. of	21 (2.9)	457 (10.5)	57 (4.1)	429 (5.3)	22 (2.9)	413 (9.1)	8.8 (0.12)
United States	21 (2.0)	564 (6.5)	70 (2.3)	536 (2.6)	9 (1.2)	498 (7.4)	9.3 (0.09)
Chinese Taipei	21 (3.3)	599 (4.3)	68 (3.9)	599 (2.2)	12 (2.8)	576 (6.5)	9.3 (0.15)
France	19 (2.8)	506 (5.4)	72 (3.0)	485 (3.5)	9 (2.3)	478 (7.0)	9.3 (0.14)
Chile	19 (3.3)	491 (7.2)	54 (4.6)	457 (3.9)	27 (3.8)	444 (6.6)	8.6 (0.17)
Kuwait	19 (3.7)	379 (9.5)	73 (3.9)	350 (5.8)	9 (1.5)	311 (5.3)	9.3 (0.13)
Slovenia	18 (2.8)	524 (4.2)	69 (3.3)	520 (2.3)	13 (2.4)	521 (4.2)	9.1 (0.12)
South Africa (5)	18 (2.5)	403 (14.1)	73 (3.1)	373 (4.5)	9 (2.1)	371 (17.9)	9.3 (0.14)
Saudi Arabia	14 (2.5)	423 (8.0)	77 (2.9)	377 (4.7)	9 (2.1)	368 (18.4)	9.2 (0.11)
Jordan	13 (2.7)	415 (13.8)	68 (3.4)	387 (4.2)	19 (3.2)	377 (10.4)	8.7 (0.14)
Turkey	13 (2.6)	510 (10.3)	70 (3.1)	483 (4.0)	17 (2.4)	464 (9.3)	8.7 (0.12)
Morocco	10 (1.8)	395 (13.5)	72 (2.7)	378 (4.9)	18 (2.3)	358 (5.7)	8.6 (0.10)
International Avg.	34 (0.5)	520 (0.9)	58 (0.5)	499 (0.6)	8 (0.3)	477 (1.7)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates that data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.9: Teaching Limited by Student Needs (Continued)

Country	Not Limited		Somewhat Limited		Very Limited		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Norway (4)	47 (4.7)	502 (2.9)	49 (4.6)	490 (3.3)	3 (1.4)	468 (28.7)	10.6 (0.16)
Dubai, UAE	46 (3.2)	539 (4.5)	53 (3.2)	495 (3.6)	2 (0.4)	~ ~	10.7 (0.12)
Abu Dhabi, UAE	29 (4.3)	458 (13.6)	64 (4.6)	411 (8.0)	6 (1.9)	336 (10.3)	9.8 (0.16)
Ontario, Canada	23 (2.8)	529 (4.3)	68 (3.4)	512 (2.7)	9 (2.0)	485 (7.3)	9.5 (0.11)
Quebec, Canada	23 (4.6)	557 (5.4)	74 (4.7)	530 (4.1)	3 (1.5)	509 (11.2)	9.7 (0.17)
Florida, US r	16 (5.1)	569 (12.6)	72 (4.6)	548 (5.6)	12 (3.7)	509 (12.1)	9.4 (0.28)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x

In your view, to what extent do the following limit how you teach this class?

	Not at all	Some	A lot
1) Students lacking prerequisite knowledge or skills	○	○	○
2) Students suffering from lack of basic nutrition	○	○	○
3) Students suffering from not enough sleep	○	○	○
4) Disruptive students	○	○	○
5) Uninterested students	○	○	○
6) Students with mental, emotional, or psychological disabilities	○	○	○

Not Limited — Somewhat Limited (11.0) — Very Limited (6.9)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.10: Teaching Limited by Student Needs

Reported by Teachers

Students were scored according to their teachers' responses concerning six needs on the *Teaching Limited by Student Needs* scale. Students with teachers who felt **Not Limited** by student needs had a score on the scale of at least 11.4, which corresponds to their teachers feeling "not at all" limited by three of the six needs and to "some" extent limited by the other three needs, on average. Students with teachers who felt **Very Limited** by student needs had a score no higher than 7.4, which corresponds to their teachers reporting feeling limited "a lot" by three of the six needs and to "some" extent limited by the other three needs, on average. All other students had teachers who felt **Somewhat Limited** by student needs.

Country	Not Limited		Somewhat Limited		Very Limited		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Japan	76 (3.1)	593 (2.6)	24 (3.1)	568 (4.1)	0 (0.0)	~ ~	12.5 (0.13)
Slovenia	53 (2.8)	528 (3.3)	43 (2.7)	503 (3.3)	3 (1.2)	510 (10.9)	11.3 (0.14)
Hungary	42 (3.5)	551 (4.7)	48 (3.5)	492 (5.1)	9 (2.3)	463 (17.3)	10.6 (0.15)
England	41 (4.0)	557 (7.0)	54 (4.1)	493 (6.4)	5 (1.6)	455 (14.5)	10.8 (0.17)
Kazakhstan	41 (4.2)	528 (8.0)	49 (3.9)	531 (7.6)	11 (2.5)	514 (16.4)	10.6 (0.21)
Ireland	41 (3.1)	546 (3.3)	53 (3.2)	514 (4.1)	6 (1.4)	449 (16.3)	10.7 (0.11)
Sweden	40 (3.7)	520 (3.8)	53 (3.7)	489 (3.9)	6 (2.1)	476 (9.2)	10.7 (0.18)
Singapore	38 (2.2)	646 (5.3)	58 (2.2)	606 (4.9)	4 (1.1)	576 (18.9)	10.7 (0.08)
Norway (9)	36 (4.2)	520 (4.2)	62 (4.2)	510 (2.9)	2 (1.0)	~ ~	10.7 (0.15)
United Arab Emirates	36 (2.0)	507 (4.8)	60 (2.1)	448 (3.5)	4 (0.9)	431 (18.8)	10.6 (0.08)
Hong Kong SAR	33 (4.4)	616 (5.9)	64 (4.7)	584 (6.7)	3 (1.5)	519 (52.0)	10.4 (0.14)
Malta	32 (0.1)	537 (1.9)	63 (0.1)	481 (1.4)	5 (0.1)	391 (4.8)	10.4 (0.01)
Lithuania	30 (3.8)	527 (7.9)	63 (4.0)	507 (3.2)	7 (1.8)	475 (9.6)	10.2 (0.14)
Israel	30 (2.6)	565 (6.3)	51 (3.5)	498 (6.7)	19 (2.2)	467 (11.3)	9.8 (0.11)
Qatar	29 (3.9)	498 (8.8)	59 (4.1)	419 (5.0)	11 (2.0)	392 (8.1)	10.2 (0.13)
Canada	29 (2.8)	552 (4.3)	63 (3.0)	524 (3.1)	8 (1.8)	500 (8.4)	10.2 (0.11)
New Zealand	29 (2.5)	540 (5.2)	67 (2.4)	477 (4.9)	5 (1.0)	433 (16.9)	10.3 (0.12)
Malaysia	29 (3.4)	506 (7.7)	60 (4.1)	458 (5.1)	12 (2.5)	413 (10.7)	9.9 (0.14)
Australia	28 (2.3)	563 (5.7)	64 (2.3)	493 (3.4)	8 (1.4)	458 (9.2)	10.3 (0.10)
Lebanon	27 (3.6)	436 (7.0)	68 (3.7)	442 (5.1)	5 (1.7)	466 (17.0)	10.2 (0.17)
Russian Federation	26 (4.2)	545 (7.8)	62 (4.4)	538 (5.8)	12 (2.3)	519 (8.9)	10.0 (0.18)
Korea, Rep. of	24 (3.2)	620 (6.3)	67 (3.2)	603 (2.8)	8 (2.2)	583 (9.7)	9.9 (0.16)
United States	23 (2.6)	553 (6.7)	68 (2.7)	512 (3.8)	8 (1.7)	471 (10.1)	9.9 (0.12)
Chinese Taipei	23 (3.4)	629 (8.0)	63 (3.9)	596 (2.8)	14 (2.5)	567 (10.2)	9.7 (0.15)
Italy	22 (3.4)	509 (5.2)	69 (3.6)	490 (3.2)	9 (2.3)	486 (11.7)	9.9 (0.14)
Oman	21 (2.8)	426 (6.9)	56 (3.4)	399 (3.5)	24 (2.6)	394 (5.8)	9.2 (0.12)
Georgia	20 (3.4)	460 (7.7)	75 (3.6)	454 (3.8)	5 (1.7)	415 (9.2)	9.8 (0.12)
Bahrain	18 (3.9)	481 (7.5)	68 (4.5)	450 (2.7)	14 (2.7)	446 (5.1)	9.6 (0.13)
Thailand	17 (3.1)	481 (14.0)	78 (3.6)	422 (4.4)	5 (1.8)	408 (23.5)	9.9 (0.12)
Kuwait	15 (3.2)	437 (16.8)	71 (3.8)	387 (6.3)	15 (2.7)	374 (6.9)	9.4 (0.14)
Botswana (9)	14 (3.3)	398 (7.3)	72 (3.9)	392 (2.6)	14 (3.3)	380 (7.9)	9.3 (0.15)
South Africa (9)	14 (2.8)	371 (16.1)	70 (3.8)	376 (5.5)	17 (2.8)	356 (9.9)	9.2 (0.13)
Chile	12 (2.8)	487 (9.9)	63 (4.4)	429 (5.0)	25 (4.1)	399 (6.2)	8.9 (0.18)
Jordan	11 (2.3)	404 (9.5)	70 (3.6)	389 (4.1)	19 (3.0)	367 (7.4)	9.1 (0.11)
Saudi Arabia	9 (2.4)	425 (18.8)	80 (3.7)	365 (4.4)	11 (3.2)	336 (11.8)	9.1 (0.13)
Egypt	8 (1.6)	409 (18.6)	76 (3.2)	393 (4.6)	17 (3.0)	378 (9.1)	9.1 (0.11)
Iran, Islamic Rep. of	7 (1.6)	504 (18.5)	62 (3.1)	436 (5.0)	31 (2.9)	425 (6.5)	8.5 (0.12)
Morocco	6 (1.5)	394 (12.7)	63 (3.2)	384 (2.8)	31 (3.0)	383 (4.2)	8.5 (0.09)
Turkey	5 (1.4)	527 (17.8)	70 (2.8)	462 (5.6)	25 (2.8)	433 (7.7)	8.7 (0.11)
International Avg.	27 (0.5)	510 (1.5)	62 (0.6)	475 (0.7)	11 (0.4)	446 (2.4)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "x" indicates that data are available for less than 50% of students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.10: Teaching Limited by Student Needs (Continued)

Country	Not Limited		Somewhat Limited		Very Limited		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	54 (3.3)	536 (3.7)	43 (2.6)	485 (4.9)	3 (1.9)	512 (17.5)	11.2 (0.16)
Quebec, Canada	40 (4.6)	571 (6.1)	53 (5.2)	535 (4.3)	7 (2.8)	531 (12.7)	10.6 (0.18)
Norway (8)	36 (3.8)	503 (3.4)	61 (3.8)	479 (2.2)	3 (1.2)	465 (16.7)	10.6 (0.14)
Abu Dhabi, UAE r	28 (4.5)	483 (15.5)	66 (4.9)	432 (7.5)	7 (2.2)	404 (11.2)	10.3 (0.16)
Ontario, Canada r	23 (3.1)	541 (4.9)	68 (3.5)	523 (3.9)	9 (2.6)	484 (8.0)	10.0 (0.14)
Florida, US r	15 (5.6)	572 (18.7)	61 (6.4)	503 (8.8)	24 (4.2)	456 (12.4)	9.1 (0.32)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x

In your view, to what extent do the following limit how you teach this class?

	Not at all	Some	A lot
1) Students lacking prerequisite knowledge or skills	○	○	○
2) Students suffering from lack of basic nutrition	○	○	○
3) Students suffering from not enough sleep	○	○	○
4) Disruptive students	○	○	○
5) Uninterested students	○	○	○
6) Students with mental, emotional, or psychological disabilities	○	○	○

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.11: Frequency of Student Absences

Reported by Students

Country	Never or Almost Never		Once a Month		Once Every Two Weeks		Once a Week or More	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Korea, Rep. of	93 (0.5)	612 (2.3)	5 (0.4)	574 (5.6)	1 (0.2)	~ ~	1 (0.2)	~ ~
Portugal	87 (0.6)	546 (2.2)	6 (0.4)	524 (4.8)	2 (0.2)	~ ~	5 (0.4)	491 (6.9)
Spain	86 (0.7)	510 (2.4)	7 (0.5)	498 (4.9)	2 (0.2)	~ ~	5 (0.4)	452 (7.0)
Belgium (Flemish)	85 (0.8)	551 (2.1)	9 (0.5)	526 (5.1)	1 (0.2)	~ ~	5 (0.4)	513 (5.1)
Chinese Taipei	83 (0.7)	603 (1.9)	11 (0.5)	584 (4.3)	1 (0.2)	~ ~	5 (0.4)	541 (5.3)
France	83 (0.8)	494 (2.9)	9 (0.6)	478 (4.5)	2 (0.3)	~ ~	5 (0.5)	437 (7.1)
Germany r	82 (0.8)	530 (1.9)	10 (0.7)	522 (5.2)	3 (0.3)	505 (9.9)	5 (0.4)	473 (7.5)
Russian Federation	81 (0.9)	568 (3.2)	12 (0.6)	558 (5.9)	3 (0.3)	541 (10.1)	5 (0.4)	523 (7.8)
Hong Kong SAR	80 (0.8)	621 (2.9)	14 (0.8)	599 (5.3)	2 (0.3)	~ ~	3 (0.3)	553 (7.9)
Netherlands	80 (0.9)	534 (1.9)	12 (0.6)	524 (3.9)	2 (0.3)	~ ~	6 (0.5)	496 (4.3)
Japan	79 (0.8)	602 (2.0)	12 (0.6)	571 (3.9)	6 (0.5)	547 (4.3)	3 (0.3)	540 (8.0)
Lithuania	79 (0.8)	540 (2.6)	12 (0.6)	536 (4.0)	4 (0.3)	514 (11.3)	5 (0.4)	488 (6.2)
Singapore	76 (0.8)	634 (3.5)	14 (0.5)	598 (4.4)	3 (0.2)	541 (8.4)	8 (0.6)	519 (7.3)
Norway (5)	76 (0.8)	553 (2.4)	15 (0.6)	548 (3.5)	3 (0.3)	526 (7.3)	5 (0.3)	516 (6.9)
England	75 (0.9)	555 (3.0)	16 (0.7)	541 (4.8)	3 (0.3)	518 (7.6)	6 (0.5)	483 (5.6)
Cyprus	73 (1.0)	535 (2.7)	18 (0.8)	510 (3.8)	3 (0.3)	485 (6.8)	5 (0.4)	475 (5.7)
Northern Ireland	73 (1.2)	583 (2.8)	16 (0.9)	560 (4.6)	3 (0.3)	518 (8.5)	7 (0.5)	490 (6.5)
Sweden	71 (1.0)	523 (3.1)	21 (1.0)	520 (3.6)	4 (0.5)	498 (8.2)	4 (0.4)	463 (9.2)
Croatia	70 (1.0)	509 (1.8)	22 (0.9)	497 (2.8)	3 (0.3)	459 (7.6)	5 (0.4)	455 (7.0)
United States	70 (0.7)	549 (2.3)	18 (0.5)	539 (3.1)	4 (0.2)	509 (5.6)	9 (0.4)	484 (3.3)
Italy	70 (1.0)	515 (2.8)	16 (0.6)	504 (3.8)	5 (0.4)	490 (6.4)	9 (0.7)	462 (4.9)
Ireland	70 (1.2)	558 (2.1)	20 (0.9)	541 (3.5)	4 (0.5)	506 (8.6)	6 (0.5)	476 (5.7)
Canada	68 (0.6)	520 (2.0)	18 (0.4)	513 (2.6)	6 (0.3)	490 (6.3)	9 (0.4)	452 (5.2)
Slovenia	68 (1.0)	528 (1.9)	18 (0.7)	517 (3.7)	4 (0.4)	496 (6.5)	10 (0.6)	484 (5.0)
Serbia	66 (1.3)	530 (3.2)	20 (1.4)	519 (5.6)	6 (0.4)	497 (6.6)	8 (1.7)	442 (15.4)
Chile	66 (1.0)	465 (2.6)	12 (0.6)	471 (3.8)	7 (0.4)	447 (5.7)	15 (0.7)	432 (3.8)
Poland	65 (1.0)	546 (2.1)	20 (0.8)	532 (4.0)	6 (0.4)	514 (6.5)	10 (0.5)	481 (4.7)
Denmark	64 (1.2)	548 (3.1)	17 (0.8)	532 (4.2)	4 (0.3)	520 (7.5)	15 (0.8)	517 (4.5)
Australia	63 (1.1)	528 (3.4)	23 (1.0)	523 (4.1)	5 (0.4)	474 (7.8)	8 (0.5)	450 (5.1)
Turkey	63 (1.1)	502 (3.2)	21 (0.8)	474 (3.5)	7 (0.4)	443 (8.0)	9 (0.8)	419 (7.3)
Oman	62 (1.0)	440 (2.8)	17 (0.8)	419 (4.1)	5 (0.3)	380 (6.9)	15 (0.6)	399 (4.1)
Bulgaria	62 (1.2)	540 (4.5)	16 (0.8)	515 (7.0)	12 (0.7)	505 (7.9)	10 (0.6)	477 (9.0)
Morocco	62 (1.3)	391 (3.5)	22 (1.1)	377 (5.7)	7 (0.4)	345 (6.4)	9 (0.6)	346 (7.1)
Kazakhstan	61 (1.2)	553 (5.2)	21 (0.9)	540 (4.9)	8 (0.5)	526 (6.5)	11 (0.7)	522 (6.2)
Iran, Islamic Rep. of	61 (1.3)	442 (3.8)	21 (0.8)	435 (4.9)	7 (0.4)	408 (7.3)	12 (0.6)	396 (5.5)
Bahrain	57 (0.7)	466 (1.9)	20 (0.6)	457 (3.0)	6 (0.3)	412 (5.1)	17 (0.4)	413 (3.2)
United Arab Emirates	57 (0.6)	473 (2.4)	18 (0.5)	456 (3.6)	7 (0.3)	403 (4.8)	18 (0.5)	404 (3.3)
Qatar	56 (1.1)	458 (3.8)	18 (0.7)	438 (4.3)	8 (0.5)	402 (6.2)	18 (0.8)	400 (5.8)
Finland	55 (1.1)	541 (2.3)	37 (0.9)	534 (2.5)	4 (0.4)	530 (6.3)	4 (0.3)	473 (6.8)
Jordan	54 (1.5)	410 (3.8)	24 (1.3)	385 (5.7)	8 (0.8)	360 (6.5)	13 (0.7)	349 (5.6)
Kuwait	53 (1.2)	372 (5.4)	20 (0.9)	344 (5.8)	9 (0.5)	324 (6.4)	18 (0.8)	326 (5.5)
Czech Republic	50 (1.1)	539 (2.2)	34 (0.9)	530 (3.0)	8 (0.5)	508 (5.0)	8 (0.5)	476 (5.3)
Hungary	47 (1.2)	554 (2.6)	38 (1.0)	527 (3.1)	6 (0.5)	478 (8.7)	9 (0.6)	449 (6.5)
South Africa (5)	45 (1.2)	405 (3.8)	17 (0.6)	384 (5.4)	13 (0.6)	324 (5.9)	25 (0.9)	349 (4.0)
Georgia	44 (1.1)	482 (3.9)	30 (1.0)	462 (4.8)	12 (0.7)	446 (6.3)	14 (0.7)	431 (6.2)
Saudi Arabia	43 (1.2)	396 (4.5)	22 (0.9)	399 (4.5)	13 (0.7)	373 (8.7)	22 (0.9)	362 (5.8)
Slovak Republic	41 (0.9)	516 (2.8)	37 (0.8)	504 (3.1)	9 (0.5)	473 (6.5)	13 (0.7)	446 (5.0)
Indonesia	41 (1.2)	414 (4.1)	17 (0.8)	406 (5.4)	10 (0.6)	378 (7.2)	32 (1.1)	383 (4.2)
New Zealand	- -	- -	- -	- -	- -	- -	- -	- -
International Avg.	67 (0.1)	516 (0.4)	18 (0.1)	501 (0.6)	5 (0.1)	465 (1.1)	10 (0.1)	455 (0.9)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.
An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.11: Frequency of Student Absences (Continued)

Country	Never or Almost Never		Once a Month		Once Every Two Weeks		Once a Week or More	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Benchmarking Participants								
Quebec, Canada	76 (1.1)	540 (4.1)	15 (0.8)	540 (6.1)	4 (0.5)	519 (8.2)	5 (0.6)	490 (8.2)
Norway (4)	75 (0.8)	497 (2.3)	13 (0.6)	494 (4.3)	3 (0.3)	493 (11.8)	9 (0.6)	462 (4.9)
Florida, US	68 (1.1)	557 (4.5)	15 (0.8)	545 (7.5)	6 (0.6)	526 (10.4)	11 (0.8)	497 (7.3)
Ontario, Canada	65 (0.7)	521 (2.5)	20 (0.6)	513 (3.1)	6 (0.4)	500 (5.7)	9 (0.5)	461 (5.1)
Buenos Aires, Argentina	64 (0.8)	443 (3.1)	14 (0.7)	437 (4.9)	8 (0.4)	422 (4.8)	15 (0.7)	410 (3.6)
Dubai, UAE	63 (0.9)	522 (1.6)	18 (0.8)	517 (4.8)	5 (0.3)	476 (5.7)	13 (0.6)	461 (2.9)
Abu Dhabi, UAE	53 (1.5)	449 (4.9)	18 (0.8)	418 (6.6)	8 (0.6)	368 (6.8)	21 (1.0)	371 (6.1)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 9.12: Frequency of Student Absences

Reported by Students

Country	Never or Almost Never		Once a Month		Once Every Two Weeks		Once a Week or More	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Korea, Rep. of	96 (0.3)	609 (2.6)	3 (0.2)	520 (9.1)	1 (0.1)	~ ~	0 (0.1)	~ ~
Chinese Taipei	89 (0.6)	605 (2.3)	8 (0.5)	575 (6.8)	1 (0.2)	~ ~	2 (0.2)	~ ~
Japan	87 (0.6)	593 (2.3)	8 (0.5)	564 (4.7)	3 (0.3)	519 (11.4)	2 (0.2)	~ ~
Hong Kong SAR	87 (0.8)	600 (4.5)	9 (0.5)	576 (5.4)	2 (0.3)	~ ~	2 (0.3)	~ ~
Singapore	82 (0.7)	633 (2.8)	12 (0.5)	587 (5.6)	3 (0.2)	552 (7.4)	3 (0.3)	505 (9.6)
Thailand	71 (1.0)	446 (5.1)	13 (0.6)	409 (5.3)	6 (0.4)	397 (6.1)	9 (0.6)	372 (5.7)
Morocco	70 (0.6)	395 (2.1)	17 (0.4)	368 (3.4)	5 (0.3)	362 (4.8)	8 (0.3)	353 (4.4)
Iran, Islamic Rep. of	70 (1.0)	447 (4.7)	22 (0.9)	423 (5.7)	4 (0.3)	391 (8.4)	4 (0.3)	366 (10.5)
Norway (9)	69 (0.9)	519 (2.3)	22 (0.8)	501 (3.3)	6 (0.4)	504 (4.8)	2 (0.3)	~ ~
England	69 (1.0)	531 (4.3)	24 (0.8)	505 (5.1)	5 (0.4)	489 (7.8)	3 (0.3)	440 (10.0)
South Africa (9)	66 (1.0)	387 (4.9)	17 (0.6)	368 (5.2)	5 (0.3)	337 (7.6)	12 (0.6)	323 (3.7)
Lebanon	66 (1.2)	455 (3.7)	18 (0.7)	436 (4.9)	6 (0.6)	413 (6.2)	10 (0.6)	401 (5.7)
Malta	66 (0.9)	517 (1.5)	23 (0.7)	473 (2.5)	6 (0.4)	438 (5.6)	5 (0.4)	393 (6.8)
Sweden	65 (1.1)	512 (2.6)	23 (0.9)	491 (4.1)	8 (0.6)	484 (6.0)	5 (0.6)	442 (8.6)
Botswana (9)	64 (0.8)	412 (2.2)	19 (0.6)	377 (3.1)	5 (0.3)	301 (5.6)	13 (0.4)	348 (3.6)
Ireland	63 (0.9)	535 (2.8)	27 (0.8)	516 (3.4)	7 (0.4)	494 (6.2)	3 (0.3)	444 (7.8)
United Arab Emirates	62 (0.6)	481 (2.1)	21 (0.4)	465 (2.8)	8 (0.3)	430 (3.5)	9 (0.3)	389 (3.4)
Lithuania	62 (1.1)	515 (3.2)	25 (0.9)	513 (3.8)	9 (0.6)	506 (5.7)	4 (0.4)	458 (9.4)
United States	62 (0.8)	528 (3.3)	26 (0.6)	516 (3.2)	8 (0.3)	498 (4.0)	4 (0.3)	441 (6.0)
Chile	60 (1.2)	435 (3.5)	21 (0.8)	430 (4.5)	10 (0.5)	428 (5.7)	8 (0.6)	371 (6.3)
Canada	60 (0.8)	537 (2.3)	27 (0.7)	524 (2.4)	9 (0.4)	511 (3.9)	4 (0.3)	470 (7.1)
Australia	59 (0.8)	519 (3.3)	28 (0.8)	501 (3.3)	9 (0.4)	488 (3.8)	5 (0.3)	428 (6.0)
Russian Federation	58 (1.2)	542 (4.6)	23 (0.9)	539 (5.3)	12 (0.7)	532 (6.9)	6 (0.5)	504 (9.8)
Turkey	58 (1.0)	485 (5.0)	27 (0.7)	438 (4.9)	9 (0.5)	417 (6.6)	6 (0.4)	358 (7.6)
Oman	57 (0.9)	419 (2.5)	25 (0.7)	398 (3.7)	6 (0.4)	363 (6.9)	12 (0.5)	361 (3.6)
Kazakhstan	57 (1.3)	537 (5.6)	30 (1.2)	519 (5.7)	9 (0.6)	511 (9.2)	5 (0.4)	507 (10.4)
Slovenia	57 (1.0)	521 (2.6)	32 (0.9)	517 (2.4)	8 (0.5)	502 (5.1)	3 (0.4)	477 (7.8)
Italy	55 (1.0)	505 (2.9)	27 (0.8)	495 (3.4)	13 (0.7)	477 (4.4)	5 (0.5)	424 (8.1)
Jordan	52 (1.0)	409 (3.3)	30 (0.8)	378 (3.6)	9 (0.4)	358 (6.0)	9 (0.5)	317 (6.0)
Israel	50 (1.0)	530 (4.3)	30 (0.8)	513 (4.4)	12 (0.5)	489 (6.4)	8 (0.6)	433 (7.8)
Qatar	47 (0.8)	475 (3.8)	31 (0.7)	428 (3.5)	11 (0.5)	386 (5.1)	11 (0.4)	352 (4.8)
Bahrain	45 (0.8)	475 (2.6)	32 (0.7)	453 (1.8)	12 (0.5)	422 (4.0)	12 (0.4)	403 (3.4)
Malaysia	45 (1.2)	495 (3.7)	26 (0.6)	465 (4.1)	11 (0.6)	435 (4.7)	18 (0.8)	414 (4.3)
Hungary	43 (0.9)	540 (3.8)	45 (0.9)	508 (4.5)	9 (0.5)	473 (6.5)	4 (0.4)	394 (10.2)
Egypt	40 (1.2)	411 (4.8)	20 (0.6)	390 (5.6)	15 (0.7)	379 (5.0)	24 (1.0)	376 (5.3)
Kuwait	37 (1.4)	429 (7.3)	28 (1.0)	400 (4.9)	18 (0.7)	359 (5.6)	18 (1.0)	339 (5.8)
Georgia	33 (1.2)	476 (4.4)	38 (1.1)	455 (3.8)	19 (0.9)	447 (5.7)	11 (0.7)	393 (6.8)
Saudi Arabia	32 (1.3)	396 (6.3)	28 (0.8)	367 (4.7)	20 (0.8)	359 (5.4)	20 (1.2)	332 (5.9)
New Zealand	- -	- -	- -	- -	- -	- -	- -	- -
International Avg.	61 (0.2)	496 (0.6)	23 (0.1)	471 (0.7)	8 (0.1)	442 (1.0)	8 (0.1)	404 (1.2)
Benchmarking Participants								
Norway (8)	71 (0.9)	491 (2.1)	22 (0.7)	486 (3.2)	5 (0.4)	473 (6.2)	2 (0.2)	~ ~
Quebec, Canada	71 (1.1)	550 (3.6)	21 (1.0)	542 (3.8)	6 (0.6)	529 (7.4)	2 (0.4)	~ ~
Dubai, UAE	65 (0.9)	526 (2.5)	22 (0.9)	505 (3.1)	6 (0.4)	480 (5.5)	7 (0.5)	435 (5.8)
Abu Dhabi, UAE	60 (1.1)	461 (4.7)	21 (0.8)	445 (6.4)	9 (0.6)	401 (6.1)	11 (0.6)	361 (5.9)
Ontario, Canada	55 (0.9)	533 (3.0)	29 (0.8)	521 (3.2)	11 (0.6)	510 (4.4)	4 (0.3)	463 (8.7)
Florida, US	53 (1.1)	505 (6.4)	28 (0.9)	498 (7.3)	12 (0.8)	479 (8.5)	7 (0.9)	421 (8.2)
Buenos Aires, Argentina	48 (1.1)	404 (5.1)	23 (0.9)	413 (5.3)	16 (0.8)	396 (6.7)	13 (1.0)	332 (6.5)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report achievement.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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TIMSS 2015

CHAPTER 10: STUDENT ENGAGEMENT AND ATTITUDES

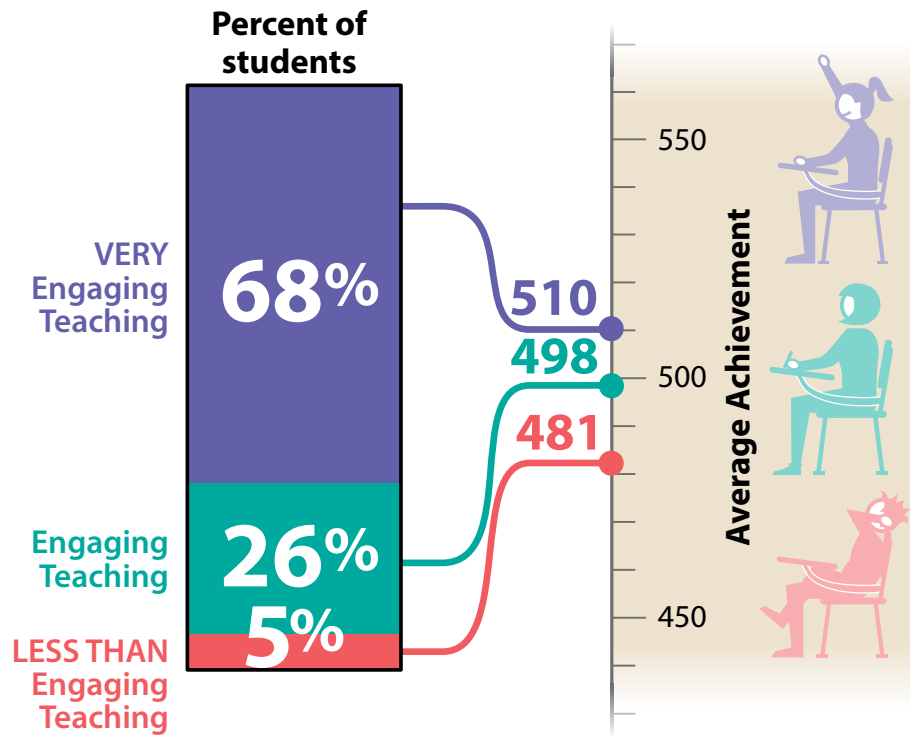
TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

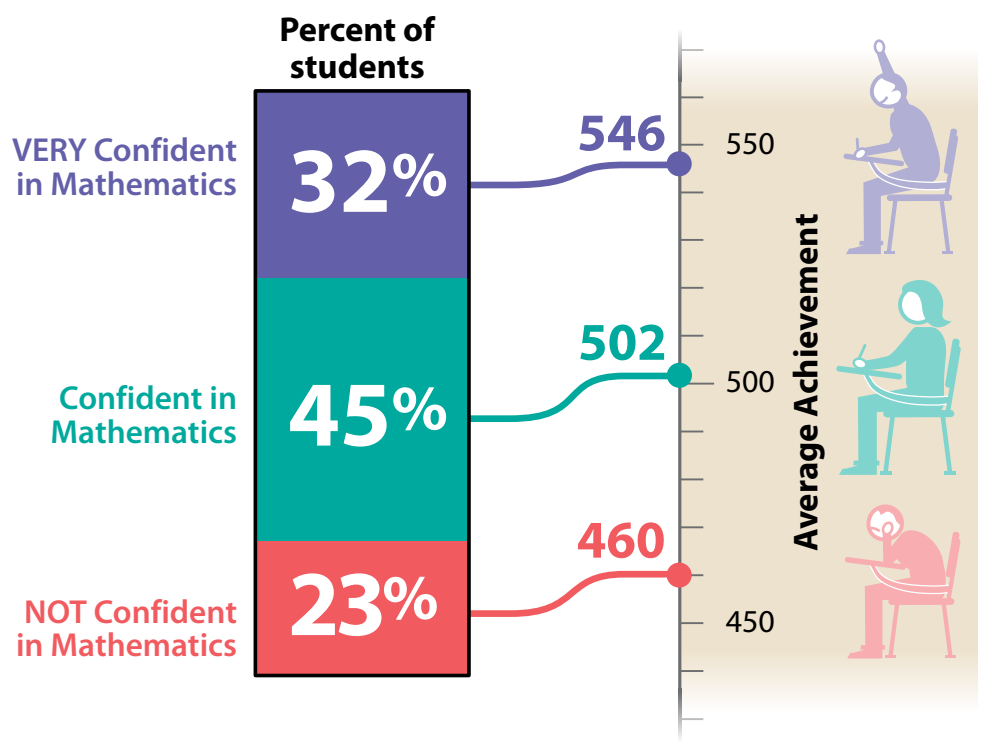
Students' Attitudes Toward Mathematics

The fourth grade students were very positive about their mathematics teaching, but less so about the subject.

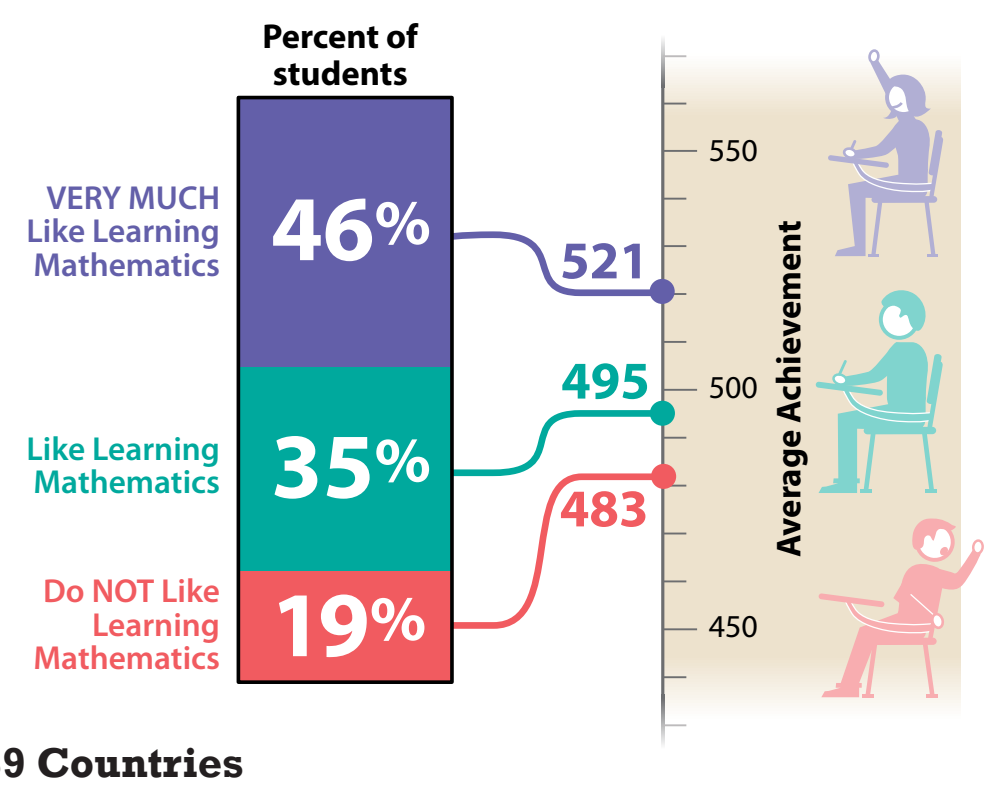
Almost all students (94%) were positive about their instruction—68% reported VERY engaging teaching and 26% engaging teaching.



Most students (77%) were VERY confident or confident in mathematics, but 23% were NOT confident.



Most students (81%) VERY MUCH liked or liked learning mathematics, but 19% did NOT.



Trends 2011-2015: 39 Countries

Between 2011 and 2015, there were more decreases than increases in students' attitudes.

- The scale average for *Students Like Learning Mathematics* decreased in **11** countries and increased in **8** countries.
- The scale average for *Students Confident in Mathematics* decreased in **16** countries and increased in **7** countries.

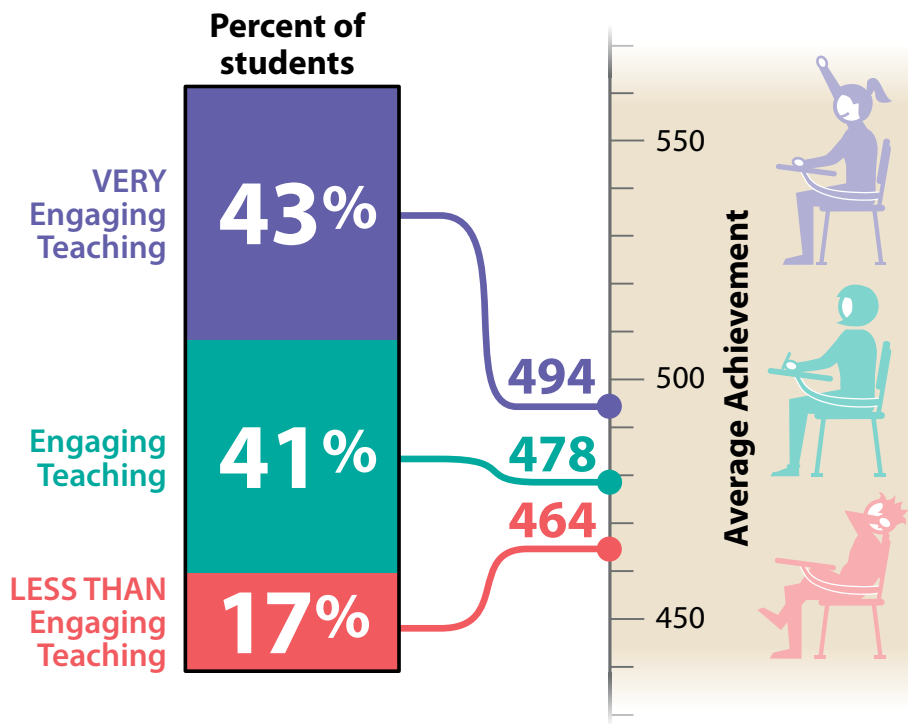
SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

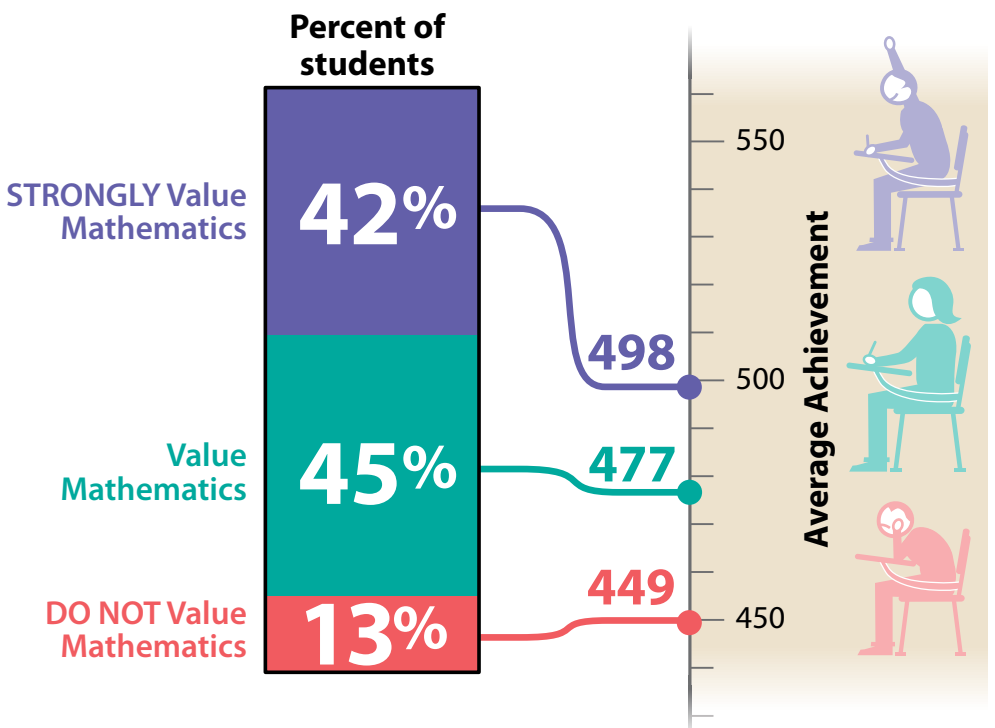
Students' Attitudes Toward Mathematics

The eighth grade students were positive about their mathematics teaching and value mathematics. They were less positive about how much they liked learning the subject and their confidence in mathematics.

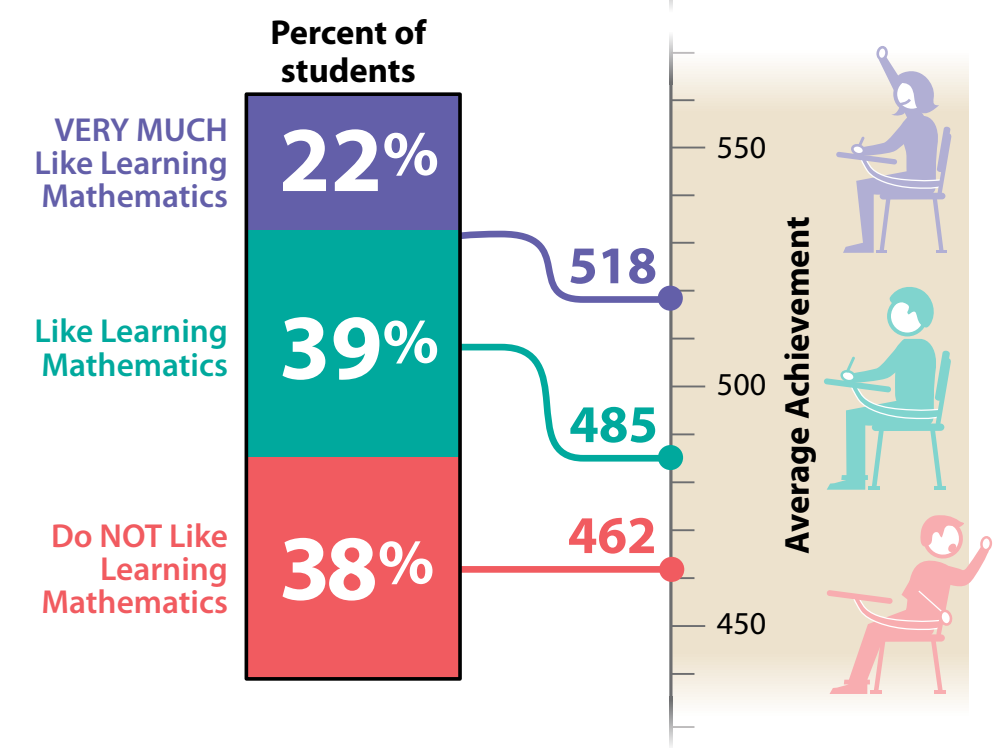
Most students (84%) were positive about their instruction— 43% reported VERY engaging teaching and 41% engaging teaching.



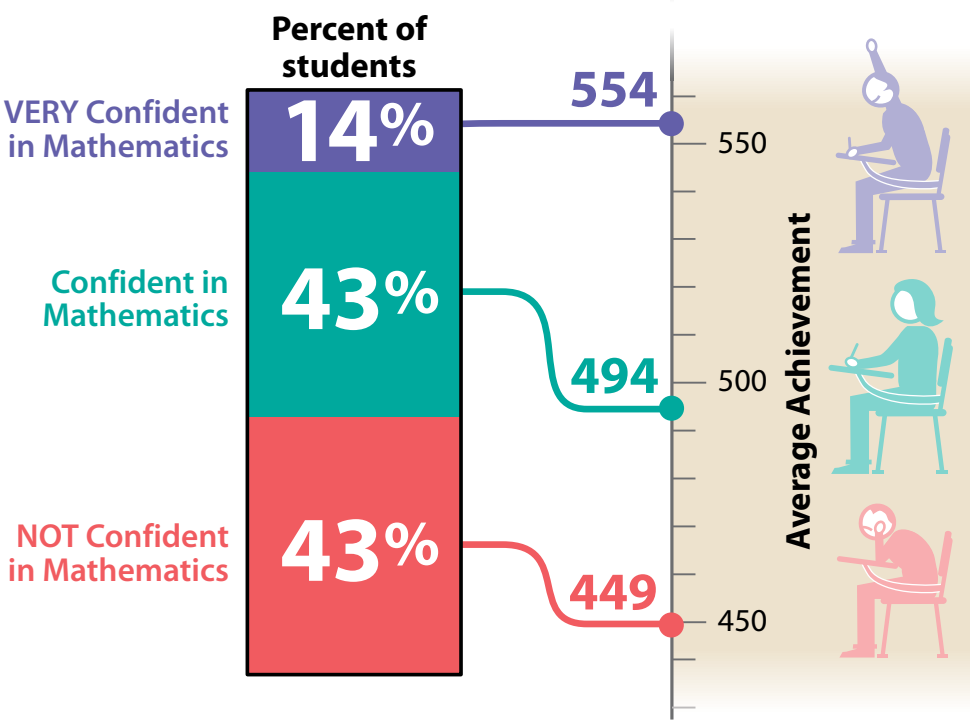
Most students (87%) reported STRONGLY valuing or valuing mathematics.



The majority of students (61%) VERY MUCH liked or liked learning mathematics, but 38% did NOT.



The majority of students (57%) were VERY confident or confident in mathematics, but 43% were NOT confident.



Trends 2011-2015: 33 Countries

Between 2011 and 2015, there were more decreases than increases in students' attitudes.

- The scale average for *Students Like Learning Mathematics* decreased in **6** countries and increased in **4** countries.
- The scale average for *Students Confident in Mathematics* decreased in **10** countries and increased in **9** countries.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015.
http://timss2015.org/download-center/

IEA TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Exhibit 10.1: Students' Views on Engaging Teaching in Mathematics Lessons

Reported by Students

Students were scored according to their degree of agreement with ten statements on the *Students' Views on Engaging Teaching in Mathematics Lessons* scale. Students who experienced **Very Engaging Teaching** in mathematics lessons had a score on the scale of at least 9.0, which corresponds to their "agreeing a lot" with five of the ten statements and "agreeing a little" with the other five, on average. Students who experienced teaching that was **Less than Engaging** had a score no higher than 7.0, which corresponds to their "disagreeing a little" with five of the ten statements and "agreeing a little" with the other five, on average. All other students experienced **Engaging Teaching** in mathematics lessons.

Country	Very Engaging Teaching		Engaging Teaching		Less than Engaging Teaching		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Portugal	88 (0.7)	543 (2.3)	11 (0.7)	535 (4.3)	1 (0.2)	~ ~	10.9 (0.04)
Bulgaria	87 (1.0)	530 (5.1)	11 (0.9)	503 (8.0)	2 (0.3)	~ ~	11.2 (0.06)
Iran, Islamic Rep. of	86 (0.8)	436 (3.5)	11 (0.7)	419 (7.0)	2 (0.2)	~ ~	11.1 (0.05)
Serbia	85 (0.9)	520 (3.7)	14 (0.8)	513 (5.5)	2 (0.2)	~ ~	11.0 (0.06)
Turkey	83 (0.7)	495 (3.0)	15 (0.6)	438 (5.7)	2 (0.2)	~ ~	10.7 (0.05)
Indonesia	83 (0.7)	405 (3.7)	15 (0.6)	381 (5.9)	2 (0.3)	~ ~	10.8 (0.05)
Jordan	83 (1.3)	399 (3.1)	14 (1.1)	359 (8.3)	3 (0.4)	332 (12.9)	10.9 (0.07)
Morocco	82 (1.0)	386 (3.6)	15 (0.9)	359 (6.5)	3 (0.3)	311 (12.1)	10.8 (0.06)
Oman	82 (0.9)	435 (2.6)	15 (0.7)	393 (4.2)	3 (0.4)	364 (8.1)	10.7 (0.05)
Spain	82 (1.3)	506 (2.5)	15 (0.9)	509 (3.2)	3 (0.5)	493 (7.1)	10.7 (0.07)
Russian Federation	77 (1.1)	566 (3.6)	21 (1.0)	560 (4.5)	2 (0.2)	~ ~	10.3 (0.06)
Hungary	77 (1.0)	532 (3.3)	20 (0.9)	523 (4.3)	3 (0.3)	504 (12.8)	10.4 (0.05)
Cyprus	77 (1.2)	527 (2.6)	18 (0.9)	521 (4.6)	6 (0.7)	509 (7.2)	10.4 (0.06)
Bahrain	75 (0.8)	460 (1.8)	20 (0.6)	436 (2.2)	6 (0.4)	413 (5.7)	10.4 (0.05)
Lithuania	75 (1.0)	538 (2.7)	23 (0.9)	527 (3.9)	3 (0.3)	534 (6.8)	10.1 (0.05)
Northern Ireland	74 (1.2)	572 (3.4)	22 (1.0)	570 (4.7)	4 (0.5)	549 (13.0)	10.2 (0.07)
Kazakhstan	73 (1.6)	551 (4.5)	25 (1.5)	529 (5.6)	1 (0.2)	~ ~	10.4 (0.08)
Ireland	73 (1.3)	550 (2.2)	23 (1.1)	545 (4.0)	4 (0.4)	525 (7.3)	10.2 (0.06)
Kuwait	73 (1.3)	359 (5.0)	21 (1.0)	343 (5.8)	6 (0.5)	321 (8.9)	10.3 (0.07)
Chile	73 (1.3)	465 (2.6)	22 (0.9)	451 (3.8)	6 (0.5)	430 (6.8)	10.3 (0.07)
England	73 (1.3)	548 (3.3)	24 (1.2)	545 (3.7)	4 (0.4)	527 (8.1)	10.1 (0.06)
United States	73 (0.7)	545 (2.3)	22 (0.6)	535 (2.9)	5 (0.3)	510 (4.7)	10.2 (0.04)
Saudi Arabia	73 (1.1)	396 (3.9)	21 (0.9)	370 (5.4)	6 (0.5)	342 (8.6)	10.3 (0.06)
Canada	72 (0.8)	514 (2.0)	24 (0.7)	511 (2.7)	4 (0.3)	487 (6.8)	10.1 (0.04)
Slovak Republic	70 (1.4)	495 (2.9)	26 (1.1)	507 (3.2)	5 (0.4)	499 (8.4)	10.0 (0.06)
Qatar	70 (1.1)	452 (3.5)	23 (0.8)	429 (4.7)	8 (0.6)	387 (5.6)	10.1 (0.06)
United Arab Emirates	70 (0.7)	465 (2.5)	25 (0.6)	431 (3.2)	6 (0.4)	402 (8.0)	10.1 (0.04)
Norway (5)	70 (1.2)	552 (2.6)	26 (1.0)	545 (3.6)	4 (0.5)	533 (8.4)	9.9 (0.05)
Italy	69 (1.2)	510 (2.7)	28 (1.0)	506 (3.6)	3 (0.4)	479 (10.7)	9.8 (0.05)
South Africa (5)	68 (1.3)	396 (3.8)	25 (1.0)	345 (4.1)	6 (0.5)	314 (5.6)	10.1 (0.06)
Germany r	67 (1.2)	526 (2.3)	29 (1.0)	526 (2.9)	4 (0.4)	512 (6.3)	9.8 (0.05)
Belgium (Flemish)	66 (1.5)	544 (2.0)	32 (1.4)	550 (2.9)	2 (0.3)	~ ~	9.7 (0.06)
Croatia	64 (1.3)	505 (2.0)	33 (1.2)	498 (2.5)	3 (0.4)	490 (11.2)	9.9 (0.07)
France	64 (1.2)	488 (2.7)	33 (1.1)	491 (4.0)	3 (0.3)	464 (8.3)	9.8 (0.05)
Netherlands	64 (1.3)	533 (1.9)	33 (1.2)	527 (2.7)	4 (0.4)	513 (6.2)	9.6 (0.04)
Australia	63 (1.2)	519 (3.5)	31 (0.9)	520 (3.5)	6 (0.4)	492 (6.8)	9.7 (0.05)
New Zealand	63 (1.1)	489 (2.6)	31 (0.9)	498 (3.2)	6 (0.4)	482 (6.6)	9.7 (0.04)
Sweden	60 (1.1)	518 (3.1)	35 (1.0)	521 (3.1)	5 (0.4)	512 (6.6)	9.5 (0.04)
Czech Republic	59 (1.4)	525 (2.5)	35 (1.1)	534 (2.9)	6 (0.5)	522 (5.2)	9.4 (0.05)
Georgia	58 (1.3)	474 (4.0)	40 (1.3)	461 (4.3)	2 (0.3)	~ ~	9.9 (0.06)
Finland	58 (1.1)	540 (2.3)	37 (1.0)	532 (2.8)	5 (0.5)	516 (6.2)	9.4 (0.04)
Slovenia	58 (1.4)	521 (2.3)	37 (1.1)	522 (2.3)	5 (0.7)	503 (6.2)	9.6 (0.06)
Poland	57 (1.3)	535 (2.3)	35 (1.0)	538 (2.9)	8 (0.8)	522 (5.6)	9.5 (0.06)
Singapore	55 (1.0)	625 (4.0)	37 (0.7)	613 (4.3)	7 (0.5)	592 (6.7)	9.3 (0.04)
Denmark	53 (1.6)	547 (3.1)	38 (1.2)	533 (3.0)	9 (0.8)	522 (5.3)	9.1 (0.06)
Chinese Taipei	51 (1.2)	603 (2.2)	37 (0.9)	595 (2.5)	11 (0.8)	576 (4.2)	9.2 (0.05)
Hong Kong SAR	50 (1.3)	621 (3.3)	38 (1.0)	612 (3.5)	11 (0.8)	591 (4.6)	9.2 (0.06)
Korea, Rep. of	28 (1.3)	620 (2.9)	55 (1.1)	606 (2.4)	17 (1.3)	597 (4.4)	8.2 (0.05)
Japan	26 (1.2)	597 (2.7)	54 (1.0)	595 (2.1)	20 (1.2)	583 (3.8)	8.2 (0.05)
International Avg.	68 (0.2)	510 (0.4)	26 (0.1)	498 (0.6)	5 (0.1)	481 (1.2)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 10.1: Students' Views on Engaging Teaching in Mathematics Lessons (Continued)

Country	Very Engaging Teaching		Engaging Teaching		Less than Engaging Teaching		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Buenos Aires, Argentina	79 (1.0)	439 (2.9)	17 (0.8)	437 (4.3)	4 (0.3)	434 (8.5)	10.5 (0.05)
Norway (4)	77 (1.3)	495 (2.3)	20 (1.1)	492 (3.9)	3 (0.4)	467 (11.1)	10.3 (0.06)
Florida, US	77 (1.1)	551 (4.9)	20 (1.0)	541 (5.5)	3 (0.4)	500 (11.5)	10.5 (0.06)
Dubai, UAE	76 (0.7)	519 (1.8)	20 (0.6)	490 (2.9)	4 (0.3)	473 (9.7)	10.5 (0.03)
Ontario, Canada	72 (1.1)	516 (2.3)	23 (1.0)	509 (3.2)	5 (0.5)	490 (6.5)	10.1 (0.05)
Quebec, Canada	69 (1.4)	536 (4.2)	28 (1.2)	538 (5.5)	3 (0.6)	523 (11.0)	10.0 (0.07)
Abu Dhabi, UAE	64 (1.4)	436 (5.2)	30 (1.3)	401 (6.7)	7 (0.7)	372 (10.0)	9.9 (0.06)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How much do you agree with these statements about your mathematics lessons?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) I know what my teacher expects me to do	○	○	○	○
2) My teacher is easy to understand	○	○	○	○
3) I am interested in what my teacher says	○	○	○	○
4) My teacher gives me interesting things to do	○	○	○	○
5) My teacher has clear answers to my questions	○	○	○	○
6) My teacher is good at explaining mathematics	○	○	○	○
7) My teacher lets me show what I have learned	○	○	○	○
8) My teacher does a variety of things to help us learn	○	○	○	○
9) My teacher tells me how to do better when I make a mistake	○	○	○	○
10) My teacher listens to what I have to say	○	○	○	○

Very Engaging Teaching | 9.0 | Engaging Teaching | 7.0 | Less than Engaging Teaching

Downloaded from timss2015.org/download-center

Exhibit 10.2: Students' Views on Engaging Teaching in Mathematics Lessons

Reported by Students

Students were scored according to their degree of agreement with ten statements on the *Students' Views on Engaging Teaching in Mathematics Lessons* scale. Students who experienced **Very Engaging Teaching** in mathematics lessons had a score on the scale of at least 10.4, which corresponds to their "agreeing a lot" with five of the ten statements and "agreeing a little" with the other five, on average. Students who experienced teaching that was **Less than Engaging** had a score no higher than 8.2, which corresponds to their "disagreeing a little" with five of the ten statements and "agreeing a little" with the other five, on average. All other students experienced **Engaging Teaching** in mathematics lessons.

Country	Very Engaging Teaching		Engaging Teaching		Less than Engaging Teaching		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Jordan	68 (1.2)	394 (3.3)	25 (0.9)	377 (4.3)	7 (0.5)	361 (6.1)	11.1 (0.05)
Egypt	65 (1.4)	404 (4.1)	27 (1.0)	378 (5.9)	8 (0.6)	369 (8.0)	11.0 (0.07)
Lebanon	64 (1.6)	450 (3.7)	25 (1.2)	436 (5.3)	11 (0.9)	426 (6.1)	11.0 (0.08)
Morocco	62 (1.3)	390 (2.3)	29 (0.8)	376 (3.0)	10 (0.7)	384 (4.4)	10.7 (0.05)
South Africa (9)	61 (1.2)	378 (4.7)	31 (0.9)	367 (5.3)	8 (0.6)	376 (7.1)	10.7 (0.05)
Turkey	60 (1.4)	470 (5.1)	31 (1.0)	438 (5.4)	10 (0.8)	445 (8.1)	10.6 (0.06)
Botswana (9)	60 (1.4)	408 (1.8)	31 (0.9)	374 (3.5)	10 (0.9)	378 (6.3)	10.7 (0.06)
Oman	59 (1.2)	416 (2.7)	34 (1.0)	391 (3.1)	8 (0.5)	370 (5.5)	10.6 (0.04)
Iran, Islamic Rep. of	55 (1.6)	442 (4.8)	33 (1.0)	435 (5.3)	12 (0.9)	418 (7.1)	10.5 (0.07)
Georgia	52 (1.2)	467 (3.6)	40 (0.9)	444 (4.3)	8 (0.7)	425 (9.2)	10.6 (0.05)
Saudi Arabia	50 (1.7)	376 (4.8)	35 (1.1)	366 (5.5)	15 (1.0)	349 (6.4)	10.2 (0.07)
Kazakhstan	49 (1.7)	542 (5.6)	47 (1.6)	516 (6.2)	4 (0.4)	499 (8.4)	10.6 (0.06)
Kuwait	49 (1.6)	398 (5.3)	37 (1.1)	391 (5.5)	15 (1.0)	384 (9.3)	10.2 (0.06)
Chile	48 (1.8)	435 (3.9)	33 (1.0)	425 (3.7)	19 (1.5)	415 (5.6)	10.1 (0.09)
Canada	46 (1.2)	534 (2.2)	40 (0.7)	530 (2.5)	14 (1.0)	509 (3.9)	10.2 (0.05)
Israel	45 (1.3)	513 (5.3)	36 (0.8)	515 (4.2)	20 (0.9)	504 (4.9)	10.0 (0.06)
United Arab Emirates	45 (0.9)	484 (2.6)	41 (0.7)	455 (2.4)	14 (0.6)	438 (3.7)	10.2 (0.04)
Russian Federation	44 (1.2)	548 (5.5)	46 (1.1)	533 (4.7)	11 (0.8)	519 (5.6)	10.2 (0.05)
Qatar	43 (1.3)	459 (3.7)	37 (0.8)	432 (3.5)	19 (1.0)	406 (4.4)	10.0 (0.06)
Thailand	43 (1.1)	431 (4.8)	48 (0.9)	432 (5.1)	9 (0.6)	430 (9.4)	10.1 (0.04)
United States	43 (1.2)	530 (3.5)	36 (0.7)	515 (3.3)	21 (1.0)	504 (4.0)	10.0 (0.06)
Bahrain	42 (1.5)	466 (2.3)	37 (1.0)	452 (2.2)	21 (1.2)	438 (2.9)	9.9 (0.07)
Malta	41 (0.7)	505 (2.1)	37 (0.8)	496 (2.2)	22 (0.6)	478 (2.8)	9.8 (0.03)
Malaysia	40 (1.2)	472 (4.1)	50 (0.9)	466 (3.9)	11 (0.8)	438 (5.9)	10.0 (0.05)
Lithuania	39 (1.7)	523 (3.7)	45 (1.1)	505 (3.1)	17 (1.5)	502 (4.3)	9.9 (0.07)
England	38 (1.7)	532 (5.4)	42 (1.0)	518 (4.8)	20 (1.4)	501 (6.0)	9.8 (0.08)
Ireland	37 (1.4)	528 (3.3)	41 (1.0)	523 (3.4)	22 (1.1)	517 (3.8)	9.7 (0.06)
Hungary	34 (1.6)	530 (6.5)	46 (1.1)	507 (3.9)	20 (1.3)	505 (5.3)	9.6 (0.07)
Australia	34 (1.3)	521 (3.7)	42 (0.7)	506 (3.2)	24 (1.3)	485 (4.6)	9.5 (0.07)
Singapore	33 (1.0)	633 (3.6)	52 (0.8)	620 (3.4)	16 (0.8)	596 (6.3)	9.7 (0.04)
Norway (9)	33 (1.3)	526 (3.0)	44 (1.0)	510 (2.8)	23 (1.4)	496 (3.1)	9.5 (0.06)
New Zealand	32 (1.5)	506 (4.9)	44 (0.9)	495 (3.9)	24 (1.3)	475 (3.5)	9.5 (0.07)
Italy	31 (1.3)	500 (3.5)	50 (1.0)	495 (3.0)	19 (1.2)	482 (4.6)	9.6 (0.05)
Sweden	31 (1.6)	517 (3.5)	49 (1.2)	500 (3.0)	20 (1.5)	481 (4.1)	9.5 (0.07)
Hong Kong SAR	26 (1.3)	606 (4.9)	49 (0.9)	595 (4.3)	24 (1.5)	581 (8.1)	9.3 (0.08)
Chinese Taipei	23 (1.2)	629 (3.3)	52 (1.0)	602 (2.6)	25 (1.6)	565 (5.2)	9.2 (0.07)
Slovenia	20 (1.0)	538 (4.8)	59 (1.3)	515 (2.3)	21 (1.2)	500 (3.1)	9.2 (0.05)
Japan	10 (0.7)	610 (5.0)	50 (1.2)	594 (2.7)	40 (1.6)	572 (3.0)	8.5 (0.05)
Korea, Rep. of	8 (0.5)	642 (5.0)	52 (1.2)	614 (3.2)	40 (1.4)	589 (2.7)	8.4 (0.04)
International Avg.	43 (0.2)	494 (0.7)	41 (0.2)	478 (0.6)	17 (0.2)	464 (0.9)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 10.2: Students' Views on Engaging Teaching in Mathematics Lessons (Continued)

Country	Very Engaging Teaching		Engaging Teaching		Less than Engaging Teaching		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Ontario, Canada	53 (1.7)	529 (2.6)	35 (1.1)	522 (3.5)	12 (1.1)	501 (4.9)	10.5 (0.07)
Dubai, UAE	53 (1.3)	524 (2.9)	35 (1.2)	504 (3.0)	12 (0.8)	486 (5.5)	10.4 (0.05)
Buenos Aires, Argentina	51 (1.7)	398 (5.4)	32 (1.2)	398 (4.9)	18 (1.4)	394 (7.9)	10.2 (0.09)
Norway (8)	40 (1.3)	495 (2.6)	44 (0.9)	487 (2.4)	16 (0.9)	470 (3.6)	9.9 (0.05)
Florida, US	40 (2.5)	504 (8.5)	38 (1.4)	491 (6.6)	23 (2.1)	486 (6.9)	9.9 (0.13)
Abu Dhabi, UAE	40 (2.0)	459 (7.2)	44 (1.3)	438 (4.9)	16 (1.2)	419 (7.2)	10.0 (0.08)
Quebec, Canada	33 (1.6)	554 (3.9)	51 (1.3)	547 (3.6)	16 (1.7)	524 (8.0)	9.7 (0.07)

How much do you agree with these statements about your mathematics lessons?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) I know what my teacher expects me to do	○	○	○	○
2) My teacher is easy to understand	○	○	○	○
3) I am interested in what my teacher says	○	○	○	○
4) My teacher gives me interesting things to do	○	○	○	○
5) My teacher has clear answers to my questions	○	○	○	○
6) My teacher is good at explaining mathematics	○	○	○	○
7) My teacher lets me show what I have learned	○	○	○	○
8) My teacher does a variety of things to help us learn	○	○	○	○
9) My teacher tells me how to do better when I make a mistake	○	○	○	○
10) My teacher listens to what I have to say	○	○	○	○

Very Engaging Teaching 10.4 | Engaging Teaching 8.2 | Less than Engaging Teaching

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 10.3: Students Like Learning Mathematics

Reported by Students

Students were scored according to their degree of agreement with nine statements on the *Students Like Learning Mathematics* scale. Students who **Very Much Like Learning Mathematics** had a score on the scale of at least 10.1, which corresponds to their "agreeing a lot" with five of the nine statements and "agreeing a little" with the other four, on average. Students who **Do Not Like Learning Mathematics** had a score no higher than 8.3, which corresponds to their "disagreeing a little" with five of the nine statements and "agreeing a little" with the other four, on average. All other students **Like Learning Mathematics**.

Country	Very Much Like Learning Mathematics		Like Learning Mathematics		Do Not Like Learning Mathematics		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Turkey	79 (1.0)	497 (2.7)	18 (0.8)	439 (5.5)	4 (0.4)	436 (9.9)	11.3 (0.04)	0.3 (0.06) ▲
Oman	70 (0.9)	443 (2.8)	25 (0.8)	391 (3.2)	5 (0.3)	374 (7.0)	11.0 (0.04)	0.5 (0.06) ▲
Kazakhstan	69 (1.4)	552 (4.5)	29 (1.2)	530 (5.7)	2 (0.4)	~ ~	11.0 (0.05)	0.1 (0.07)
Jordan	68 (1.5)	409 (3.5)	25 (1.3)	350 (5.8)	7 (0.6)	364 (10.4)	11.0 (0.06)	◊ ◊
Morocco	67 (1.3)	399 (3.6)	28 (1.1)	346 (4.9)	5 (0.4)	324 (12.9)	10.9 (0.04)	0.7 (0.08) ▲
Indonesia	66 (1.3)	415 (3.3)	31 (1.2)	376 (4.6)	4 (0.6)	337 (16.5)	10.7 (0.04)	◊ ◊
Iran, Islamic Rep. of	65 (1.4)	449 (3.7)	28 (1.2)	398 (5.5)	7 (0.5)	411 (8.6)	10.8 (0.05)	0.1 (0.07)
Portugal	61 (1.0)	556 (2.4)	28 (0.8)	522 (2.9)	10 (0.7)	508 (4.8)	10.6 (0.05)	0.2 (0.08) ▲
Bulgaria	56 (1.3)	540 (4.9)	30 (1.0)	511 (6.2)	14 (0.9)	498 (6.5)	10.4 (0.06)	◊ ◊
Cyprus	56 (1.2)	538 (2.6)	27 (0.9)	514 (3.7)	17 (0.9)	501 (4.8)	10.3 (0.05)	◊ ◊
Bahrain	55 (0.9)	471 (1.9)	32 (0.6)	428 (2.3)	13 (0.6)	435 (3.7)	10.4 (0.04)	0.2 (0.08)
Kuwait	55 (1.5)	371 (4.9)	31 (1.2)	330 (5.8)	13 (0.9)	336 (6.6)	10.3 (0.06)	◊ ◊
United Arab Emirates	55 (0.8)	472 (2.7)	33 (0.5)	427 (2.9)	12 (0.6)	437 (5.1)	10.4 (0.03)	-0.1 (0.05)
Saudi Arabia	54 (1.3)	406 (3.7)	33 (1.0)	364 (5.6)	13 (1.0)	367 (6.7)	10.3 (0.05)	-0.2 (0.08)
Russian Federation	52 (1.1)	577 (4.4)	37 (0.8)	555 (3.4)	11 (0.9)	536 (3.9)	10.2 (0.04)	-0.3 (0.06) ▼
Georgia	52 (1.5)	481 (3.9)	45 (1.4)	452 (4.4)	4 (0.4)	420 (10.6)	10.5 (0.05)	-0.8 (0.06) ▼
Italy	51 (1.2)	515 (3.2)	31 (0.9)	502 (3.0)	18 (0.8)	496 (4.2)	10.1 (0.05)	0.0 (0.07)
France	50 (1.1)	501 (3.0)	35 (0.9)	480 (3.8)	14 (0.7)	466 (3.9)	10.1 (0.04)	◊ ◊
Lithuania	50 (1.1)	545 (2.6)	36 (1.1)	530 (3.3)	13 (0.7)	514 (5.0)	10.2 (0.04)	-0.2 (0.06) ▼
England	50 (1.4)	555 (3.7)	32 (0.9)	546 (3.5)	17 (1.0)	523 (4.4)	10.1 (0.05)	0.3 (0.08) ▲
Serbia	50 (1.5)	527 (5.2)	30 (1.1)	517 (4.1)	19 (1.0)	502 (5.0)	10.1 (0.06)	0.3 (0.09) ▲
Qatar	49 (1.3)	462 (3.6)	36 (1.1)	423 (4.6)	15 (0.8)	414 (5.3)	10.2 (0.06)	0.2 (0.08) ▲
Chile	47 (1.3)	476 (2.9)	33 (0.8)	447 (2.9)	19 (1.0)	442 (3.4)	10.0 (0.06)	0.1 (0.07)
Spain	46 (1.3)	516 (3.1)	34 (1.0)	500 (2.6)	19 (1.0)	492 (3.1)	9.9 (0.05)	-0.1 (0.08)
South Africa (5)	46 (1.2)	416 (3.5)	46 (0.9)	345 (3.9)	8 (0.4)	350 (6.7)	10.1 (0.04)	◊ ◊
Norway (5)	43 (1.4)	558 (3.4)	36 (1.0)	548 (3.1)	20 (1.0)	534 (3.7)	9.8 (0.05)	◊ ◊
New Zealand	43 (0.9)	498 (3.1)	34 (0.7)	488 (3.2)	23 (0.8)	485 (3.4)	9.8 (0.04)	-0.1 (0.06)
United States	42 (0.8)	555 (2.8)	35 (0.5)	536 (2.7)	23 (0.7)	524 (2.3)	9.7 (0.04)	0.0 (0.05)
Slovak Republic	42 (1.2)	504 (3.4)	38 (0.9)	497 (3.0)	20 (0.9)	490 (3.9)	9.8 (0.05)	-0.1 (0.07)
Singapore	39 (0.8)	640 (4.1)	38 (0.7)	611 (4.1)	23 (0.8)	591 (4.5)	9.6 (0.03)	-0.3 (0.05) ▼
Hungary	39 (1.1)	548 (3.9)	38 (0.9)	523 (4.0)	22 (1.1)	507 (4.3)	9.7 (0.05)	-0.3 (0.07) ▼
Canada	38 (0.9)	529 (2.2)	38 (0.6)	508 (2.6)	24 (0.9)	491 (3.0)	9.6 (0.04)	◊ ◊
Germany r	38 (1.2)	537 (2.6)	35 (0.9)	525 (2.6)	27 (1.1)	511 (3.0)	9.5 (0.05)	r -0.1 (0.07)
Ireland	38 (1.2)	561 (3.0)	39 (0.9)	547 (2.6)	23 (1.1)	528 (3.2)	9.6 (0.05)	0.0 (0.08)
Denmark	38 (1.4)	553 (3.6)	42 (1.1)	538 (2.9)	21 (1.1)	518 (4.0)	9.6 (0.05)	0.1 (0.07)
Australia	37 (1.0)	535 (4.7)	36 (0.8)	516 (3.1)	27 (0.7)	496 (4.2)	9.5 (0.04)	-0.2 (0.07) ▼
Northern Ireland	35 (1.1)	585 (4.0)	38 (1.0)	573 (3.8)	27 (1.1)	547 (4.4)	9.5 (0.05)	0.1 (0.08)
Hong Kong SAR	35 (1.1)	631 (3.2)	38 (1.0)	612 (3.6)	27 (1.2)	596 (3.8)	9.5 (0.05)	-0.5 (0.07) ▼
Sweden	35 (1.3)	523 (4.1)	40 (1.1)	518 (3.2)	25 (1.3)	514 (3.3)	9.5 (0.05)	-0.3 (0.08) ▼
Czech Republic	35 (0.9)	539 (2.8)	40 (0.8)	530 (2.8)	25 (0.9)	511 (3.2)	9.5 (0.04)	-0.4 (0.06) ▼
Poland	35 (1.0)	547 (2.9)	41 (1.1)	532 (2.7)	25 (1.3)	524 (3.2)	9.4 (0.05)	◊ ◊
Slovenia	35 (1.1)	535 (2.7)	39 (0.9)	518 (2.7)	27 (1.4)	505 (2.5)	9.4 (0.06)	-0.4 (0.08) ▼
Netherlands	33 (1.0)	543 (2.2)	39 (1.1)	528 (1.9)	27 (1.0)	517 (2.7)	9.3 (0.04)	0.1 (0.06)
Belgium (Flemish)	31 (1.2)	552 (2.3)	38 (0.8)	546 (2.7)	31 (1.5)	540 (2.9)	9.2 (0.05)	0.1 (0.08)
Croatia	29 (1.2)	515 (2.7)	41 (1.1)	500 (2.7)	29 (1.2)	494 (2.6)	9.3 (0.05)	0.2 (0.07) ▲
Finland	28 (1.0)	550 (3.4)	41 (0.9)	537 (2.4)	31 (1.0)	521 (2.5)	9.2 (0.04)	0.0 (0.08)
Japan	26 (0.9)	621 (2.6)	44 (0.9)	594 (2.3)	30 (1.2)	567 (2.4)	9.2 (0.04)	-0.1 (0.06)
Chinese Taipei	23 (1.0)	618 (3.4)	38 (1.0)	598 (2.7)	38 (1.1)	582 (2.3)	8.9 (0.05)	-0.2 (0.07) ▼
Korea, Rep. of	19 (0.7)	645 (3.3)	46 (1.0)	610 (2.4)	35 (1.0)	586 (2.7)	8.9 (0.03)	-0.1 (0.05)
International Avg.	46 (0.2)	521 (0.5)	35 (0.1)	495 (0.5)	19 (0.1)	483 (0.8)		

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 10.3: Students Like Learning Mathematics (Continued)

Country	Very Much Like Learning Mathematics		Like Learning Mathematics		Do Not Like Learning Mathematics		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Dubai, UAE	59 (0.8)	523 (2.2)	30 (0.7)	496 (2.4)	11 (0.5)	492 (4.4)	10.5 (0.03)	0.0 (0.06)
Norway (4)	55 (1.7)	503 (2.6)	30 (0.9)	487 (3.4)	15 (1.2)	471 (5.3)	10.3 (0.07)	0.1 (0.11)
Abu Dhabi, UAE	50 (1.5)	445 (5.4)	36 (1.0)	393 (5.7)	14 (1.0)	405 (7.7)	10.2 (0.06)	-0.2 (0.09)
Florida, US	49 (1.8)	563 (5.4)	32 (1.3)	538 (6.4)	19 (1.4)	525 (4.8)	10.0 (0.08)	0.2 (0.10)
Buenos Aires, Argentina	49 (1.2)	444 (3.1)	33 (0.7)	429 (3.8)	18 (1.0)	437 (4.4)	10.0 (0.05)	◊ ◊
Quebec, Canada	43 (1.4)	547 (4.4)	41 (1.2)	533 (5.1)	16 (1.1)	516 (5.0)	9.9 (0.06)	0.3 (0.08) ▲
Ontario, Canada	37 (1.3)	530 (2.5)	37 (1.0)	509 (2.9)	26 (1.5)	494 (3.7)	9.5 (0.06)	0.1 (0.08)

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How much do you agree with these statements about learning mathematics?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) I enjoy learning mathematics	○	○	○	○
2) I wish I did not have to study mathematics*	○	○	○	○
3) Mathematics is boring*	○	○	○	○
4) I learn many interesting things in mathematics	○	○	○	○
5) I like mathematics	○	○	○	○
6) I like any schoolwork that involves numbers	○	○	○	○
7) I like to solve mathematics problems	○	○	○	○
8) I look forward to mathematics lessons	○	○	○	○
9) Mathematics is one of my favorite subjects	○	○	○	○

* Reverse coded

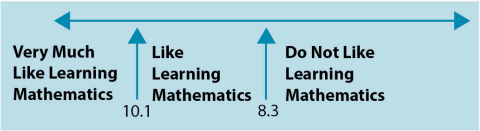

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Exhibit 10.4: Students Like Learning Mathematics

Reported by Students

Students were scored according to their degree of agreement with nine statements on the *Students Like Learning Mathematics* scale. Students who **Very Much Like Learning Mathematics** had a score on the scale of at least 11.4, which corresponds to their "agreeing a lot" with five of the nine statements and "agreeing a little" with the other four, on average. Students who **Do Not Like Learning Mathematics** had a score no higher than 9.4, which corresponds to their "disagreeing a little" with five of the nine statements and "agreeing a little" with the other four, on average. All other students **Like Learning Mathematics**.

Country	Very Much Like Learning Mathematics		Like Learning Mathematics		Do Not Like Learning Mathematics		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Botswana (9)	50 (1.1)	416 (1.9)	38 (1.0)	373 (3.1)	12 (0.6)	377 (5.0)	11.4 (0.04)	0.4 (0.06) ▲
Morocco	44 (0.8)	411 (2.5)	40 (0.6)	368 (3.1)	16 (0.6)	357 (2.4)	11.1 (0.03)	-0.1 (0.04)
South Africa (9)	39 (1.2)	386 (4.7)	42 (0.8)	362 (4.9)	19 (1.0)	377 (6.3)	10.9 (0.05)	0.1 (0.06)
Oman	39 (1.0)	436 (3.1)	45 (0.8)	385 (2.6)	17 (0.7)	382 (3.6)	11.0 (0.04)	0.2 (0.05) ▲
Egypt	39 (1.5)	429 (4.1)	42 (1.0)	369 (4.7)	20 (1.0)	378 (5.0)	10.9 (0.07)	◊ ◊
Jordan	39 (1.0)	410 (3.6)	37 (0.8)	373 (4.0)	24 (0.8)	377 (4.2)	10.8 (0.05)	0.0 (0.08)
Kazakhstan	34 (1.3)	548 (5.9)	54 (1.1)	522 (5.9)	12 (0.8)	503 (6.3)	11.0 (0.05)	0.1 (0.07)
Iran, Islamic Rep. of	32 (1.1)	470 (6.1)	39 (0.9)	430 (4.8)	28 (1.1)	407 (4.3)	10.5 (0.05)	-0.1 (0.08)
Lebanon	31 (1.3)	466 (4.5)	45 (1.5)	434 (4.7)	23 (1.4)	430 (4.6)	10.6 (0.06)	0.1 (0.08)
Malaysia	28 (1.0)	497 (4.1)	56 (0.7)	459 (3.9)	16 (0.8)	433 (4.9)	10.7 (0.04)	-0.1 (0.07)
Turkey	28 (1.0)	495 (6.6)	42 (0.8)	445 (5.4)	30 (1.0)	443 (4.5)	10.3 (0.05)	0.0 (0.07)
Kuwait	26 (1.1)	413 (6.0)	38 (1.1)	392 (5.7)	36 (1.4)	379 (5.0)	10.0 (0.07)	◊ ◊
United Arab Emirates	25 (0.7)	502 (3.0)	43 (0.6)	461 (2.3)	32 (0.8)	442 (2.6)	10.2 (0.04)	-0.1 (0.05)
Singapore	24 (0.7)	654 (3.2)	42 (0.8)	625 (3.5)	33 (0.8)	592 (4.3)	10.1 (0.03)	-0.2 (0.05) ▼
Georgia	23 (1.2)	486 (4.8)	44 (1.0)	456 (4.4)	33 (1.3)	431 (4.2)	10.2 (0.06)	-0.6 (0.08) ▼
Saudi Arabia	21 (1.1)	396 (6.0)	37 (1.1)	370 (5.4)	42 (1.7)	354 (4.9)	9.8 (0.07)	-0.3 (0.11) ▼
Qatar	21 (0.8)	488 (4.8)	41 (0.8)	441 (3.9)	39 (0.9)	411 (2.9)	9.9 (0.04)	-0.1 (0.07)
Bahrain	20 (0.9)	492 (3.5)	36 (1.0)	456 (2.7)	44 (1.4)	437 (2.1)	9.7 (0.06)	0.0 (0.07)
Canada	20 (0.8)	561 (2.6)	40 (0.9)	537 (2.4)	39 (1.1)	503 (2.3)	9.8 (0.05)	◊ ◊
Thailand	20 (0.8)	466 (7.4)	58 (0.9)	425 (4.5)	23 (1.0)	418 (5.5)	10.3 (0.04)	0.0 (0.06)
Israel	19 (0.9)	524 (6.6)	36 (0.7)	517 (4.9)	44 (1.1)	502 (3.8)	9.6 (0.05)	-0.2 (0.07) ▼
Russian Federation	19 (1.0)	566 (6.8)	48 (0.7)	545 (5.1)	33 (1.1)	512 (4.6)	10.1 (0.04)	-0.3 (0.06) ▼
United States	17 (0.6)	554 (4.0)	36 (0.6)	528 (3.4)	47 (0.9)	499 (3.0)	9.5 (0.04)	0.0 (0.06)
Malta	17 (0.6)	536 (3.4)	34 (0.7)	500 (2.3)	49 (0.8)	478 (1.7)	9.5 (0.03)	◊ ◊
Italy	17 (0.9)	537 (3.7)	32 (0.9)	506 (3.4)	51 (1.2)	473 (2.8)	9.4 (0.05)	-0.1 (0.08)
Chile	16 (0.8)	466 (4.9)	34 (0.9)	435 (4.3)	50 (1.3)	410 (3.1)	9.5 (0.06)	-0.3 (0.07) ▼
Lithuania	15 (0.9)	553 (4.5)	41 (1.2)	515 (3.1)	43 (1.4)	493 (3.3)	9.7 (0.05)	-0.1 (0.07)
Hong Kong SAR	15 (0.6)	638 (4.5)	39 (0.8)	605 (4.6)	46 (1.1)	572 (5.2)	9.5 (0.04)	-0.2 (0.07)
New Zealand	14 (0.6)	534 (5.9)	40 (1.0)	501 (4.5)	46 (1.2)	476 (3.1)	9.6 (0.04)	0.1 (0.07)
England	14 (0.8)	559 (6.4)	39 (1.0)	532 (4.7)	48 (1.4)	498 (4.4)	9.5 (0.06)	0.1 (0.09)
Sweden	14 (1.3)	546 (4.7)	34 (1.2)	522 (3.4)	52 (1.5)	476 (2.9)	9.3 (0.06)	0.0 (0.07)
Ireland	14 (0.7)	562 (4.6)	35 (0.9)	537 (3.1)	52 (1.2)	505 (2.8)	9.3 (0.05)	◊ ◊
Australia	13 (0.7)	551 (4.4)	36 (0.9)	522 (3.3)	50 (1.2)	482 (3.0)	9.4 (0.05)	0.1 (0.08)
Norway (9)	13 (0.6)	562 (3.9)	35 (1.0)	527 (2.9)	52 (1.3)	490 (2.4)	9.3 (0.05)	◊ ◊
Chinese Taipei	11 (0.5)	666 (4.4)	33 (0.7)	633 (2.8)	56 (1.0)	566 (2.9)	9.2 (0.04)	0.2 (0.07) ▲
Hungary	11 (0.7)	574 (8.8)	31 (1.1)	531 (5.3)	58 (1.3)	495 (3.5)	9.1 (0.05)	0.0 (0.07)
Japan	9 (0.5)	640 (4.8)	32 (0.8)	614 (2.8)	59 (1.1)	563 (2.4)	9.2 (0.04)	0.1 (0.06)
Korea, Rep. of	8 (0.4)	668 (4.2)	34 (0.7)	634 (3.0)	58 (0.8)	581 (2.7)	9.1 (0.04)	0.2 (0.05) ▲
Slovenia	5 (0.4)	560 (7.0)	28 (1.1)	541 (2.7)	67 (1.2)	503 (2.2)	8.7 (0.05)	0.2 (0.07)
International Avg.	22 (0.1)	518 (0.8)	39 (0.1)	485 (0.6)	38 (0.2)	462 (0.6)		

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 10.4: Students Like Learning Mathematics (Continued)

Country	Very Much Like Learning Mathematics		Like Learning Mathematics		Do Not Like Learning Mathematics		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Dubai, UAE	28 (1.0)	546 (3.6)	41 (0.9)	510 (2.7)	31 (1.0)	484 (2.8)	10.3 (0.05)	0.2 (0.07) ▲
Ontario, Canada	25 (1.2)	561 (2.9)	40 (1.1)	529 (3.0)	35 (1.4)	490 (2.9)	10.0 (0.06)	0.2 (0.09)
Abu Dhabi, UAE	24 (1.4)	477 (6.6)	43 (1.0)	439 (5.4)	33 (1.5)	421 (4.8)	10.2 (0.07)	-0.1 (0.09)
Norway (8)	17 (0.9)	521 (3.4)	35 (0.8)	497 (2.7)	48 (1.1)	468 (2.2)	9.5 (0.05)	0.1 (0.07)
Buenos Aires, Argentina	17 (1.0)	417 (6.5)	35 (1.0)	404 (5.7)	48 (1.2)	384 (5.1)	9.5 (0.05)	◊ ◊
Florida, US	15 (1.1)	524 (10.7)	34 (1.1)	500 (7.5)	50 (1.7)	482 (5.9)	9.3 (0.07)	0.0 (0.11)
Quebec, Canada	12 (0.7)	573 (4.3)	42 (1.5)	558 (3.1)	46 (1.8)	528 (4.0)	9.5 (0.07)	0.2 (0.08)

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How much do you agree with these statements about learning mathematics?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) I enjoy learning mathematics	○	○	○	○
2) I wish I did not have to study mathematics*	○	○	○	○
3) Mathematics is boring*	○	○	○	○
4) I learn many interesting things in mathematics	○	○	○	○
5) I like mathematics	○	○	○	○
6) I like any schoolwork that involves numbers	○	○	○	○
7) I like to solve mathematics problems	○	○	○	○
8) I look forward to mathematics class	○	○	○	○
9) Mathematics is one of my favorite subjects	○	○	○	○

* Reverse coded

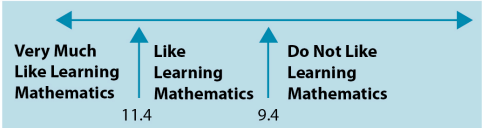

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Exhibit 10.5: Students Confident in Mathematics

Reported by Students

Students were scored according to their degree of agreement with nine statements on the *Students Confident in Mathematics* scale. Students **Very Confident in Mathematics** had a score on the scale of at least 10.6, which corresponds to their "agreeing a lot" with five of the nine statements and "agreeing a little" with the other four, on average. Students who were **Not Confident in Mathematics** had a score no higher than 8.5, which corresponds to their "disagreeing a little" with five of the nine statements and "agreeing a little" with the other four, on average. All other students were **Confident in Mathematics**.

Country	Very Confident in Mathematics		Confident in Mathematics		Not Confident in Mathematics		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Serbia	45 (1.2)	556 (5.2)	36 (1.0)	507 (4.1)	19 (0.8)	458 (4.7)	10.5 (0.05)	0.4 (0.07) ▲
Cyprus	44 (1.1)	560 (2.9)	38 (0.9)	511 (2.8)	17 (0.8)	469 (3.9)	10.5 (0.05)	◊ ◊
Norway (5)	44 (1.0)	578 (3.0)	44 (0.9)	536 (2.6)	12 (0.6)	493 (4.5)	10.5 (0.05)	◊ ◊
Bulgaria	42 (1.2)	561 (4.0)	37 (0.9)	513 (5.0)	20 (1.1)	478 (8.3)	10.5 (0.06)	◊ ◊
Jordan	42 (1.2)	434 (3.6)	39 (0.9)	376 (3.6)	19 (1.0)	328 (7.5)	10.5 (0.06)	◊ ◊
Turkey	41 (1.0)	532 (3.0)	40 (0.9)	464 (3.6)	19 (0.8)	423 (4.4)	10.4 (0.05)	0.1 (0.06)
Netherlands	40 (1.0)	562 (1.8)	39 (1.0)	522 (2.1)	21 (0.8)	484 (2.1)	10.3 (0.04)	0.2 (0.06) ▲
Kazakhstan	40 (1.5)	566 (4.9)	48 (1.2)	535 (5.3)	12 (0.9)	515 (6.3)	10.6 (0.06)	0.1 (0.09)
England	37 (1.1)	578 (4.7)	43 (1.0)	541 (3.4)	20 (0.9)	499 (3.3)	10.1 (0.05)	0.1 (0.06)
Kuwait	37 (1.1)	387 (5.2)	45 (0.9)	342 (4.9)	18 (0.7)	317 (6.5)	10.3 (0.05)	◊ ◊
Georgia	37 (1.6)	501 (4.2)	50 (1.3)	458 (3.6)	13 (0.8)	400 (6.2)	10.3 (0.06)	-0.2 (0.07) ▼
Ireland	37 (0.9)	583 (2.6)	45 (0.8)	539 (2.4)	18 (0.8)	498 (3.7)	10.2 (0.04)	-0.2 (0.07) ▼
Sweden	36 (1.3)	548 (3.0)	49 (1.2)	511 (3.2)	15 (0.6)	475 (4.0)	10.2 (0.05)	-0.2 (0.07)
Italy	36 (1.0)	532 (3.1)	46 (0.9)	505 (2.8)	18 (0.7)	466 (4.0)	10.1 (0.04)	0.2 (0.06) ▲
Germany r	36 (1.2)	557 (2.4)	42 (1.0)	523 (2.2)	22 (0.8)	483 (3.4)	10.1 (0.05)	r -0.2 (0.06) ▼
Hungary	35 (0.9)	581 (3.0)	42 (0.8)	522 (3.6)	23 (0.9)	464 (5.0)	10.1 (0.04)	-0.2 (0.06) ▼
United States	35 (0.7)	583 (2.4)	41 (0.6)	534 (2.5)	24 (0.6)	492 (2.2)	10.0 (0.03)	-0.2 (0.04) ▼
Iran, Islamic Rep. of	35 (1.0)	471 (4.3)	47 (0.8)	424 (3.9)	18 (0.9)	383 (6.1)	10.2 (0.05)	-0.3 (0.08) ▼
Bahrain	35 (0.8)	492 (1.6)	44 (0.7)	444 (1.9)	21 (0.6)	407 (2.8)	10.2 (0.05)	-0.1 (0.06)
Qatar	34 (1.2)	475 (4.2)	43 (0.9)	439 (3.4)	23 (0.9)	395 (4.4)	10.1 (0.05)	-0.1 (0.07)
Oman	34 (1.1)	465 (3.4)	49 (0.9)	418 (2.8)	17 (0.6)	377 (3.3)	10.1 (0.04)	-0.3 (0.06) ▼
Denmark	34 (1.1)	578 (3.0)	49 (0.9)	529 (3.0)	17 (0.8)	490 (3.7)	10.1 (0.04)	0.2 (0.06) ▲
France	33 (0.9)	521 (3.0)	46 (1.1)	487 (3.3)	21 (0.8)	439 (4.2)	10.0 (0.03)	◊ ◊
Saudi Arabia	33 (1.3)	420 (4.2)	43 (1.1)	382 (4.7)	23 (1.1)	350 (6.3)	10.1 (0.06)	-0.3 (0.09) ▼
Spain	33 (1.0)	543 (2.6)	41 (0.8)	503 (2.8)	26 (0.9)	461 (2.9)	10.0 (0.04)	0.0 (0.07)
Canada	33 (0.7)	552 (2.3)	44 (0.6)	506 (2.3)	23 (0.7)	467 (2.5)	9.9 (0.04)	◊ ◊
Croatia	33 (1.1)	538 (2.4)	49 (1.1)	497 (2.1)	18 (0.8)	455 (3.7)	10.1 (0.04)	-0.1 (0.06)
Slovak Republic	32 (0.9)	538 (2.9)	45 (0.8)	494 (2.9)	23 (0.6)	453 (3.6)	9.9 (0.04)	0.0 (0.06)
Slovenia	32 (0.9)	559 (2.6)	46 (1.0)	517 (2.3)	22 (0.8)	471 (3.0)	9.9 (0.04)	-0.5 (0.06) ▼
Northern Ireland	31 (1.1)	614 (3.8)	46 (1.0)	568 (3.8)	23 (1.1)	518 (3.7)	9.9 (0.04)	-0.1 (0.07)
United Arab Emirates	31 (0.7)	499 (2.7)	49 (0.6)	444 (2.6)	20 (0.5)	403 (3.3)	10.0 (0.03)	-0.4 (0.04) ▼
Lithuania	30 (1.0)	578 (3.2)	50 (1.0)	530 (2.9)	20 (0.9)	486 (3.7)	9.9 (0.04)	0.1 (0.05)
Belgium (Flemish)	30 (0.9)	576 (2.7)	45 (0.8)	543 (2.5)	25 (0.9)	515 (2.7)	9.7 (0.04)	0.0 (0.06)
Morocco	29 (1.2)	421 (4.2)	49 (1.0)	375 (4.0)	22 (0.8)	337 (5.2)	10.0 (0.05)	0.3 (0.07) ▲
Poland	29 (0.9)	578 (2.9)	46 (1.1)	534 (2.3)	25 (1.0)	488 (2.7)	9.8 (0.04)	◊ ◊
Finland	28 (0.9)	572 (2.8)	51 (1.0)	532 (2.1)	20 (0.7)	493 (2.7)	9.8 (0.03)	-0.1 (0.05) ▼
Russian Federation	28 (0.8)	599 (4.7)	45 (0.9)	569 (3.6)	28 (0.8)	522 (3.4)	9.7 (0.04)	-0.1 (0.06) ▼
Australia	27 (0.8)	569 (3.9)	46 (1.0)	514 (2.9)	27 (1.0)	473 (4.1)	9.7 (0.03)	-0.4 (0.05) ▼
Chile	26 (0.9)	504 (3.1)	42 (0.9)	461 (2.6)	32 (1.1)	425 (3.0)	9.6 (0.04)	0.1 (0.06)
Portugal	25 (1.0)	592 (2.7)	42 (1.0)	546 (2.6)	33 (1.1)	497 (2.5)	9.6 (0.05)	-0.1 (0.07)
Czech Republic	24 (0.8)	570 (3.4)	48 (0.9)	530 (2.5)	28 (0.7)	489 (3.2)	9.6 (0.03)	-0.2 (0.05) ▼
Indonesia	23 (1.0)	440 (3.7)	53 (1.0)	397 (3.5)	24 (1.1)	365 (6.2)	9.7 (0.04)	◊ ◊
New Zealand	22 (0.7)	543 (3.4)	48 (0.8)	492 (2.6)	30 (0.7)	452 (3.3)	9.5 (0.03)	-0.1 (0.04) ▼
Hong Kong SAR	19 (0.8)	660 (3.7)	45 (1.0)	622 (3.0)	36 (1.1)	583 (3.4)	9.3 (0.05)	-0.1 (0.06)
Singapore	19 (0.8)	681 (3.6)	42 (0.6)	633 (3.6)	39 (1.1)	572 (4.0)	9.2 (0.05)	0.0 (0.06)
South Africa (5)	16 (0.7)	460 (6.0)	51 (0.7)	376 (3.2)	33 (0.9)	341 (3.5)	9.3 (0.03)	◊ ◊
Japan	15 (0.6)	648 (3.5)	48 (0.9)	602 (2.4)	37 (1.0)	559 (2.2)	9.1 (0.03)	0.4 (0.04) ▲
Chinese Taipei	15 (0.6)	653 (2.9)	39 (0.8)	612 (2.4)	46 (0.9)	566 (2.2)	8.9 (0.03)	-0.3 (0.05) ▼
Korea, Rep. of	13 (0.6)	668 (3.2)	51 (0.9)	623 (2.2)	36 (1.0)	566 (2.3)	9.1 (0.03)	0.1 (0.04) ▲
International Avg.	32 (0.1)	546 (0.5)	45 (0.1)	502 (0.5)	23 (0.1)	460 (0.6)		

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

An "r" indicates data are available for at least 70% but less than 85% of the students.

▲ Significantly higher than 2011
▼ Significantly lower than 2011

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 10.5: Students Confident in Mathematics (Continued)

Country	Very Confident in Mathematics		Confident in Mathematics		Not Confident in Mathematics		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Norway (4)	47 (1.3)	520 (2.6)	42 (1.0)	478 (3.1)	11 (0.7)	442 (5.2)	10.7 (0.05)	0.1 (0.07)
Florida, US	39 (1.7)	585 (4.9)	39 (1.3)	541 (5.2)	22 (1.2)	493 (5.5)	10.3 (0.07)	0.0 (0.09)
Quebec, Canada	38 (1.4)	567 (4.7)	44 (1.4)	528 (4.0)	17 (1.2)	491 (5.9)	10.2 (0.06)	0.1 (0.08)
Dubai, UAE	36 (0.9)	545 (2.8)	46 (0.8)	503 (1.7)	17 (0.5)	463 (3.1)	10.2 (0.04)	-0.1 (0.06)
Ontario, Canada	31 (1.0)	556 (2.7)	44 (0.7)	508 (2.4)	25 (0.8)	470 (3.4)	9.9 (0.05)	-0.1 (0.07)
Buenos Aires, Argentina	27 (0.8)	477 (3.3)	45 (0.8)	438 (3.4)	28 (0.8)	403 (3.7)	9.7 (0.04)	◊ ◊
Abu Dhabi, UAE	27 (1.0)	480 (5.7)	49 (1.2)	414 (5.4)	24 (1.1)	368 (5.6)	9.8 (0.04)	-0.6 (0.08) ▼

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How much do you agree with these statements about mathematics?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) I usually do well in mathematics	○	○	○	○
2) Mathematics is harder for me than for many of my classmates*	○	○	○	○
3) I am just not good at mathematics*	○	○	○	○
4) I learn things quickly in mathematics	○	○	○	○
5) Mathematics makes me nervous*	○	○	○	○
6) I am good at working out difficult mathematics problems	○	○	○	○
7) My teacher tells me I am good at mathematics	○	○	○	○
8) Mathematics is harder for me than any other subject*	○	○	○	○
9) Mathematics makes me confused*	○	○	○	○

* Reverse coded

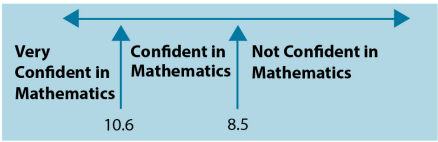

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Exhibit 10.6: Students Confident in Mathematics

Reported by Students

Students were scored according to their degree of agreement with nine statements on the *Students Confident in Mathematics* scale. Students **Very Confident in Mathematics** had a score on the scale of at least 12.1, which corresponds to their "agreeing a lot" with five of the nine statements and "agreeing a little" with the other four, on average. Students who were **Not Confident in Mathematics** had a score no higher than 9.5, which corresponds to their "disagreeing a little" with five of the nine statements and "agreeing a little" with the other four, on average. All other students were **Confident in Mathematics**.

Country	Very Confident in Mathematics		Confident in Mathematics		Not Confident in Mathematics		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Canada	26 (0.7)	579 (2.1)	41 (0.8)	535 (2.3)	33 (0.9)	482 (2.2)	10.6 (0.04)	◊ ◊
Israel	24 (0.9)	569 (5.0)	44 (0.8)	512 (4.4)	32 (1.0)	470 (3.6)	10.7 (0.05)	-0.4 (0.07) ▼
Norway (9)	23 (0.8)	576 (2.7)	41 (0.9)	515 (2.4)	36 (1.1)	468 (2.3)	10.4 (0.05)	◊ ◊
United States	21 (0.7)	573 (3.5)	40 (0.6)	530 (3.0)	39 (0.9)	480 (2.9)	10.3 (0.05)	-0.2 (0.06) ▼
Hungary	19 (0.9)	597 (5.3)	39 (0.9)	528 (3.9)	42 (1.2)	465 (3.5)	10.2 (0.06)	0.4 (0.08) ▲
Italy	19 (0.7)	553 (2.9)	38 (1.0)	507 (3.0)	43 (1.2)	458 (2.9)	10.0 (0.05)	0.1 (0.07)
Sweden	18 (1.0)	570 (3.3)	41 (1.1)	514 (3.1)	41 (1.2)	459 (2.9)	10.2 (0.06)	-0.1 (0.07)
Lebanon	18 (1.1)	494 (6.0)	45 (1.0)	446 (4.1)	37 (1.0)	422 (4.5)	10.4 (0.05)	-0.1 (0.08)
Jordan	17 (0.7)	454 (4.9)	48 (0.8)	389 (3.3)	35 (0.8)	354 (3.5)	10.5 (0.04)	-0.3 (0.06) ▼
Oman	17 (0.6)	465 (3.9)	52 (0.7)	403 (2.4)	31 (0.7)	372 (2.8)	10.5 (0.03)	0.0 (0.05)
United Arab Emirates	17 (0.5)	536 (2.9)	50 (0.6)	467 (2.1)	33 (0.7)	429 (2.5)	10.4 (0.03)	-0.2 (0.04) ▼
Iran, Islamic Rep. of	16 (0.8)	512 (5.8)	42 (0.8)	444 (5.1)	42 (1.1)	400 (3.8)	10.2 (0.05)	-0.1 (0.07)
Ireland	16 (0.8)	583 (4.0)	42 (0.9)	534 (2.9)	43 (1.0)	492 (3.2)	10.0 (0.05)	◊ ◊
Kuwait	15 (1.0)	450 (7.1)	47 (0.9)	394 (5.2)	38 (1.4)	368 (5.3)	10.2 (0.06)	◊ ◊
Qatar	15 (0.6)	520 (4.7)	47 (0.8)	447 (3.4)	38 (0.9)	398 (3.3)	10.3 (0.04)	-0.2 (0.06) ▼
England	15 (0.8)	578 (5.4)	50 (1.0)	530 (4.2)	35 (1.4)	479 (4.2)	10.3 (0.06)	0.0 (0.09)
Australia	15 (0.7)	580 (3.6)	42 (0.7)	522 (3.4)	43 (0.9)	465 (2.5)	10.0 (0.04)	-0.2 (0.08)
Lithuania	15 (0.8)	589 (3.6)	45 (0.9)	525 (2.7)	40 (1.2)	468 (2.8)	10.2 (0.05)	0.3 (0.07) ▲
Bahrain	15 (0.5)	522 (3.7)	43 (0.9)	460 (2.2)	42 (1.1)	428 (2.3)	10.1 (0.04)	0.0 (0.05)
Egypt	15 (0.8)	467 (4.9)	51 (0.8)	393 (4.0)	34 (1.1)	364 (4.5)	10.4 (0.05)	◊ ◊
Kazakhstan	15 (0.8)	571 (6.7)	57 (1.0)	533 (5.6)	28 (1.3)	496 (5.9)	10.5 (0.05)	0.2 (0.08) ▲
Turkey	14 (0.7)	571 (5.7)	32 (0.8)	473 (6.4)	54 (1.1)	419 (3.7)	9.8 (0.05)	0.0 (0.07)
Malta	13 (0.5)	571 (3.2)	37 (0.6)	506 (2.1)	49 (0.7)	468 (1.7)	9.7 (0.03)	◊ ◊
Singapore	13 (0.5)	675 (3.0)	41 (0.7)	642 (2.8)	46 (0.8)	588 (4.0)	9.7 (0.04)	-0.2 (0.05) ▼
Saudi Arabia	12 (0.9)	433 (7.8)	50 (1.3)	373 (4.4)	37 (1.5)	342 (5.4)	10.2 (0.05)	-0.4 (0.09) ▼
Russian Federation	12 (0.6)	602 (5.0)	42 (0.9)	558 (5.2)	46 (1.1)	503 (4.8)	9.8 (0.04)	-0.1 (0.06)
New Zealand	12 (0.6)	576 (4.6)	43 (0.7)	509 (3.7)	44 (0.8)	456 (3.2)	9.9 (0.04)	-0.2 (0.07)
Georgia	12 (0.8)	533 (5.1)	44 (1.0)	473 (3.9)	44 (1.1)	415 (4.1)	10.0 (0.05)	-0.1 (0.06)
Chile	12 (0.7)	506 (4.5)	36 (0.9)	441 (3.7)	52 (1.1)	401 (3.2)	9.7 (0.05)	0.2 (0.06) ▲
Slovenia	12 (0.5)	586 (3.7)	44 (0.9)	535 (2.3)	44 (0.9)	479 (2.6)	9.9 (0.03)	-0.1 (0.05)
Hong Kong SAR	10 (0.5)	660 (4.3)	36 (0.8)	611 (5.4)	54 (0.9)	571 (4.5)	9.4 (0.05)	0.2 (0.06) ▲
South Africa (9)	10 (0.6)	448 (7.5)	43 (0.9)	375 (4.6)	48 (1.1)	359 (4.8)	9.8 (0.04)	-0.2 (0.05) ▼
Chinese Taipei	9 (0.4)	688 (3.7)	30 (0.7)	647 (3.3)	60 (0.9)	562 (2.6)	9.1 (0.04)	0.5 (0.07) ▲
Morocco	9 (0.4)	467 (3.7)	50 (0.7)	391 (2.4)	41 (0.7)	361 (2.6)	10.0 (0.02)	-0.2 (0.04) ▼
Botswana (9)	8 (0.4)	475 (4.6)	45 (0.8)	396 (2.4)	47 (0.9)	381 (2.4)	9.8 (0.03)	0.0 (0.05)
Korea, Rep. of	8 (0.4)	687 (4.9)	38 (0.7)	643 (2.8)	55 (0.8)	569 (2.7)	9.4 (0.03)	0.4 (0.04) ▲
Japan	5 (0.3)	676 (5.3)	32 (0.8)	625 (2.9)	63 (0.9)	561 (2.2)	9.0 (0.04)	0.4 (0.05) ▲
Malaysia	4 (0.2)	568 (6.6)	42 (0.9)	485 (4.2)	54 (0.9)	444 (3.5)	9.5 (0.03)	0.2 (0.04) ▲
Thailand	3 (0.3)	560 (13.9)	29 (0.9)	456 (6.3)	69 (1.0)	416 (4.2)	9.1 (0.04)	-0.2 (0.05) ▼
International Avg.	14 (0.1)	554 (0.8)	43 (0.1)	494 (0.6)	43 (0.2)	449 (0.6)		

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 10.6: Students Confident in Mathematics (Continued)

Country	Very Confident in Mathematics		Confident in Mathematics		Not Confident in Mathematics		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Ontario, Canada	29 (1.0)	576 (2.3)	40 (1.0)	526 (2.9)	30 (1.1)	469 (2.4)	10.9 (0.06)	-0.2 (0.08)
Norway (8)	27 (0.8)	538 (2.5)	44 (0.9)	486 (2.3)	29 (0.7)	442 (2.9)	10.8 (0.04)	0.4 (0.07) ▲
Dubai, UAE	20 (0.7)	574 (4.1)	47 (0.9)	516 (2.5)	33 (1.1)	470 (2.7)	10.5 (0.05)	0.0 (0.07)
Quebec, Canada	19 (1.0)	594 (3.1)	42 (1.4)	559 (2.9)	39 (1.7)	507 (4.0)	10.1 (0.08)	-0.4 (0.10) ▼
Abu Dhabi, UAE	17 (0.9)	515 (6.3)	51 (0.8)	443 (4.7)	32 (1.2)	406 (5.8)	10.5 (0.06)	-0.2 (0.07)
Florida, US	16 (1.2)	549 (8.5)	37 (1.1)	504 (7.2)	47 (1.5)	469 (5.7)	9.9 (0.08)	-0.6 (0.13) ▼
Buenos Aires, Argentina	16 (0.7)	452 (6.2)	37 (1.0)	411 (5.0)	46 (1.0)	366 (4.7)	9.9 (0.05)	◊ ◊

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How much do you agree with these statements about mathematics?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) I usually do well in mathematics	○	○	○	○
2) Mathematics is more difficult for me than for many of my classmates*	○	○	○	○
3) Mathematics is not one of my strengths*	○	○	○	○
4) I learn things quickly in mathematics	○	○	○	○
5) Mathematics makes me nervous*	○	○	○	○
6) I am good at working out difficult mathematics problems	○	○	○	○
7) My teacher tells me I am good at mathematics	○	○	○	○
8) Mathematics is harder for me than any other subject*	○	○	○	○
9) Mathematics makes me confused*	○	○	○	○

* Reverse coded

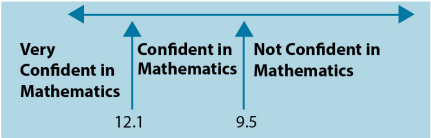

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Exhibit 10.7: Students Value Mathematics

Reported by Students

Students were scored according to their degree of agreement with nine statements on the *Students Value Mathematics* scale. Students who **Strongly Value Mathematics** had a score on the scale of at least 10.3, which corresponds to their "agreeing a lot" with five of the nine statements and "agreeing a little" with the other four, on average. Students who **Do Not Value Mathematics** had a score no higher than 7.7, which corresponds to their "disagreeing a little" with five of the nine statements and "agreeing a little" with the other four, on average. All other students **Value Mathematics**.

Country	Strongly Value Mathematics		Value Mathematics		Do Not Value Mathematics		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
South Africa (9)	72 (0.8)	382 (4.6)	24 (0.7)	360 (5.7)	4 (0.3)	329 (7.5)	11.1 (0.04)	-0.1 (0.05)
Botswana (9)	72 (0.8)	411 (1.9)	25 (0.7)	359 (3.4)	3 (0.3)	312 (6.9)	11.2 (0.04)	0.1 (0.05)
Morocco	68 (0.8)	395 (2.4)	27 (0.7)	368 (2.8)	5 (0.3)	349 (4.9)	11.1 (0.04)	-0.4 (0.05) ▼
Jordan	65 (0.9)	399 (3.3)	29 (0.8)	372 (3.8)	6 (0.4)	350 (7.2)	11.0 (0.04)	0.0 (0.06)
Egypt	61 (1.2)	409 (4.0)	32 (1.0)	374 (4.7)	7 (0.5)	365 (8.1)	10.8 (0.06)	◊ ◊
Oman	59 (0.9)	421 (2.6)	35 (0.7)	384 (2.8)	6 (0.4)	359 (6.3)	10.7 (0.04)	-0.2 (0.05) ▼
Israel	58 (1.0)	524 (4.4)	34 (0.8)	505 (4.3)	8 (0.5)	462 (7.1)	10.5 (0.05)	-0.1 (0.06)
Lebanon	58 (1.4)	453 (3.9)	34 (1.1)	438 (4.7)	9 (0.6)	425 (7.0)	10.7 (0.07)	0.3 (0.09) ▲
Iran, Islamic Rep. of	53 (1.0)	446 (5.3)	38 (0.9)	431 (4.6)	9 (0.5)	407 (6.4)	10.4 (0.04)	0.0 (0.06)
Canada	51 (0.8)	540 (2.2)	42 (0.6)	522 (2.3)	7 (0.5)	483 (3.7)	10.3 (0.03)	◊ ◊
Thailand	50 (1.2)	446 (5.3)	45 (1.1)	421 (4.9)	5 (0.4)	390 (6.9)	10.3 (0.04)	0.1 (0.06)
Turkey	47 (1.1)	472 (5.4)	41 (0.8)	449 (5.1)	12 (0.6)	436 (6.0)	10.1 (0.05)	0.1 (0.07)
England	46 (1.1)	526 (4.4)	46 (0.9)	518 (4.5)	8 (0.6)	490 (6.5)	10.1 (0.05)	0.0 (0.06)
Kuwait	46 (1.4)	405 (5.7)	42 (1.1)	388 (5.1)	12 (0.8)	366 (6.2)	10.0 (0.06)	◊ ◊
Chile	46 (1.0)	436 (3.6)	42 (0.9)	424 (3.6)	12 (0.8)	412 (5.2)	10.0 (0.04)	-0.3 (0.05) ▼
Qatar	45 (1.0)	465 (3.5)	41 (0.8)	429 (3.3)	13 (0.6)	386 (5.4)	10.0 (0.04)	-0.1 (0.07)
United Arab Emirates	45 (0.8)	487 (2.7)	45 (0.6)	456 (2.3)	11 (0.4)	420 (3.9)	10.0 (0.04)	-0.3 (0.05) ▼
Georgia	44 (1.1)	466 (4.2)	46 (1.0)	451 (3.6)	9 (0.7)	423 (6.8)	10.1 (0.05)	-0.5 (0.06) ▼
United States	44 (0.8)	531 (3.6)	45 (0.6)	516 (3.1)	11 (0.4)	488 (3.8)	10.0 (0.03)	-0.2 (0.04) ▼
Malta	44 (0.7)	509 (2.2)	45 (0.8)	492 (1.8)	11 (0.5)	458 (4.6)	10.0 (0.03)	◊ ◊
Australia	43 (0.9)	524 (3.1)	46 (0.8)	501 (3.3)	12 (0.7)	464 (3.9)	9.9 (0.04)	-0.1 (0.06)
Saudi Arabia	42 (1.4)	379 (5.4)	42 (1.0)	369 (4.8)	15 (0.9)	344 (7.2)	9.8 (0.07)	-0.3 (0.09) ▼
New Zealand	42 (0.8)	505 (4.1)	48 (0.8)	491 (3.2)	10 (0.4)	458 (5.3)	9.9 (0.03)	-0.1 (0.05)
Bahrain	41 (0.9)	473 (2.4)	43 (0.9)	450 (2.6)	16 (0.9)	424 (4.6)	9.8 (0.05)	-0.2 (0.07) ▼
Ireland	41 (0.9)	534 (3.3)	48 (0.8)	520 (3.1)	11 (0.5)	501 (4.6)	9.8 (0.04)	◊ ◊
Norway (9)	41 (1.0)	527 (2.7)	48 (0.9)	509 (2.5)	12 (0.5)	476 (3.7)	9.8 (0.04)	◊ ◊
Kazakhstan	40 (1.2)	538 (5.7)	52 (0.9)	522 (5.8)	8 (0.5)	523 (6.9)	10.0 (0.05)	-0.3 (0.07) ▼
Malaysia	39 (0.9)	487 (3.5)	53 (0.7)	458 (4.0)	8 (0.7)	425 (6.2)	9.8 (0.04)	-0.2 (0.07) ▼
Lithuania	37 (1.1)	523 (4.5)	53 (0.9)	507 (2.7)	11 (0.6)	490 (4.8)	9.7 (0.04)	-0.3 (0.05) ▼
Singapore	34 (0.8)	629 (3.5)	58 (0.7)	621 (3.4)	8 (0.4)	590 (5.8)	9.7 (0.03)	-0.3 (0.04) ▼
Russian Federation	31 (1.2)	547 (6.4)	52 (1.1)	538 (4.8)	17 (0.7)	522 (5.2)	9.4 (0.05)	-0.4 (0.07) ▼
Hungary	28 (0.9)	537 (6.2)	54 (0.9)	511 (3.6)	19 (0.9)	492 (5.0)	9.3 (0.05)	-0.2 (0.06) ▼
Sweden	28 (1.2)	518 (3.8)	58 (1.2)	501 (2.9)	14 (0.8)	471 (4.5)	9.4 (0.05)	-0.1 (0.06)
Italy	19 (0.8)	513 (3.8)	57 (0.9)	496 (3.0)	24 (0.8)	477 (3.4)	8.9 (0.03)	-0.1 (0.05)
Slovenia	19 (0.8)	532 (4.5)	64 (1.0)	516 (2.3)	17 (0.8)	499 (2.9)	9.0 (0.03)	-0.2 (0.05) ▼
Hong Kong SAR	19 (0.8)	617 (5.4)	52 (1.0)	602 (4.3)	29 (1.0)	567 (5.6)	8.7 (0.05)	-0.5 (0.06) ▼
Korea, Rep. of	13 (0.6)	656 (4.4)	63 (0.9)	614 (2.8)	24 (0.8)	557 (3.7)	8.6 (0.04)	0.0 (0.05)
Japan	11 (0.6)	614 (4.4)	59 (0.7)	595 (2.5)	29 (0.9)	560 (3.6)	8.5 (0.03)	0.0 (0.05)
Chinese Taipei	10 (0.5)	650 (4.8)	49 (0.9)	621 (2.8)	41 (1.0)	561 (2.8)	8.1 (0.04)	-0.1 (0.06)
International Avg.	42 (0.2)	498 (0.7)	45 (0.1)	477 (0.6)	13 (0.1)	449 (0.9)		

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A diamond (◊) indicates the country did not participate in the 2011 assessment.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit 10.7: Students Value Mathematics (Continued)

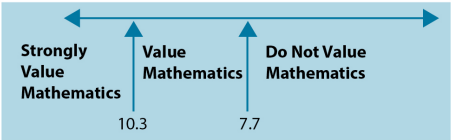
Country	Strongly Value Mathematics		Value Mathematics		Do Not Value Mathematics		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Ontario, Canada	57 (1.0)	536 (2.6)	37 (0.8)	512 (3.0)	6 (0.4)	477 (4.8)	10.5 (0.04)	0.2 (0.06)
Norway (8)	49 (1.0)	497 (2.5)	44 (1.0)	484 (2.1)	8 (0.4)	452 (4.3)	10.2 (0.04)	0.3 (0.06) ▲
Dubai, UAE	48 (1.0)	530 (2.7)	41 (0.9)	504 (3.0)	10 (0.5)	462 (4.5)	10.2 (0.04)	0.0 (0.06)
Abu Dhabi, UAE	43 (1.4)	464 (5.7)	46 (1.2)	435 (5.5)	11 (0.8)	399 (8.3)	10.0 (0.07)	-0.3 (0.08) ▼
Buenos Aires, Argentina	41 (1.3)	401 (5.4)	46 (0.9)	395 (5.1)	13 (0.9)	394 (5.9)	9.8 (0.05)	◊ ◊
Quebec, Canada	40 (1.3)	559 (3.8)	53 (1.0)	541 (3.7)	7 (0.9)	503 (7.8)	9.9 (0.06)	-0.1 (0.07)
Florida, US	37 (1.2)	500 (8.3)	48 (1.1)	495 (6.4)	15 (1.0)	485 (7.3)	9.7 (0.06)	-0.3 (0.09) ▼

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

How much do you agree with these statements about mathematics?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) I think learning mathematics will help me in my daily life	○	○	○	○
2) I need mathematics to learn other school subjects	○	○	○	○
3) I need to do well in mathematics to get into the university of my choice	○	○	○	○
4) I need to do well in mathematics to get the job I want	○	○	○	○
5) I would like a job that involves using mathematics	○	○	○	○
6) It is important to learn about mathematics to get ahead in the world	○	○	○	○
7) Learning mathematics will give me more job opportunities when I am an adult	○	○	○	○
8) My parents think that it is important that I do well in mathematics	○	○	○	○
9) It is important to do well in mathematics	○	○	○	○



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TIMSS 2015

MATHEMATICS APPENDICES

TIMSS 2015 INTERNATIONAL RESULTS IN MATHEMATICS

IEA
TIMSS & PIRLS International Study Center
Lynch School of Education, Boston College

Appendix A.1: Countries Participating in TIMSS 2015 and in Earlier TIMSS Assessments

Country	Grade 4					Grade 8					
	2015	2011	2007	2003	1995	2015	2011	2007	2003	1999	1995
Armenia	○	●	○	●		○	●	○	●		
Australia	●	●	●	●	●	●	●	●	●	○	●
Bahrain	●	●				●	●	●	●		
Belgium (Flemish)	●	●		●					●	●	●
Botswana (6, 9)		●				●	●	○	○		
Bulgaria	●							●	●	●	●
Canada	●				○	●				○	○
Chile	●	●				●	●		●	●	
Chinese Taipei	●	●	●	●		●	●	●	●	●	
Croatia	●	●									
Cyprus	●			●	●			●	●	●	●
Czech Republic	●	●	●		●			●		●	●
Denmark	●	●	●								●
Egypt						●		●	●		
England	●	●	●	●	●	●	●	●	●	●	●
Finland	●	●					●			○	
France	●										●
Georgia	●	●	●			●	●	●			
Germany	●	●	●								●
Hong Kong SAR	●	●	●	●	●	●	●	●	●	●	●
Hungary	●	●	●	●	●	●	●	●	●	●	●
Indonesia	●				○		●	●	○	○	○
Iran, Islamic Rep. of	●	●	●	●	●	●	●	●	●	●	●
Ireland	●	●			●	●					●
Israel					○	●	●	○	○	○	○
Italy	●	●	●	●	○	●	●	●	●	●	○
Japan	●	●	●	●	●	●	●	●	●	●	●
Jordan	●					●	●	●	●	●	
Kazakhstan	●	●	○			●	●				
Korea, Rep. of	●	●			●	●	●	●	●	●	●
Kuwait	●	●	○		○	●		○			○
Lebanon						●	●	●	●		
Lithuania	●	●	●	●		●	●	●	●	●	●
Malaysia						●	●	●	●	●	
Malta		●				●		●			
Morocco	●	●	○	○		●	●	○	○	○	
Netherlands	●	●	●	●	●				●	●	●
New Zealand	●	●	●	●	●	●	●		●	●	●
Northern Ireland	●	●									
Norway (5,9)	●					●					
Oman	●	●				●	●	●			
Poland	●	○									
Portugal	●	●			●						●
Qatar	●	●	○			●	●	○			
Russian Federation	●	●	●	●		●	●	●	●	●	●
Saudi Arabia	●	●				●	●	○	○		
Serbia	●	●						●	●		
Singapore	●	●	●	●	●	●	●	●	●	●	●
Slovak Republic	●	●	●						●	●	●
Slovenia	●	●	●	●	●	●	●	●	●	○	●
South Africa (5, 9)	●					●	●		○	○	○
Spain	●	●									●
Sweden	●	●	●			●	●	●	●		●
Thailand		●			○	●	●	●		●	○
Turkey	●	●				●	●	○		○	
United Arab Emirates	●	●				●	●				
United States	●	●	●	●	●	●	●	●	●	●	●

● Indicates participation in that testing cycle.

○ Indicates participation but data not comparable for measuring trends to 2015, primarily due to countries improving translations or increasing population coverage.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix A.1: Countries Participating in TIMSS 2015 and in Earlier TIMSS Assessments (Continued)

Country	Grade 4					Grade 8					
	2015	2011	2007	2003	1995	2015	2011	2007	2003	1999	1995
Benchmarking Participants											
Buenos Aires, Argentina	●					●					
Ontario, Canada	●	●	●	●	●	●	●	●	●	●	●
Quebec, Canada	●	●	●	●	●	●	●	●	●	●	●
Norway (4,8)	●	●	●	●	●	●	●	●	●		●
Abu Dhabi, UAE	●	●				●	●				
Dubai, UAE	●	●	●			●	●	●			
Florida, US	●	●				●	●				

● Indicates participation in that testing cycle.

○ Indicates participation but data not comparable for measuring trends to 2015, primarily due to countries improving translations or increasing population coverage.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix B.1: Distribution of Items Included in the Assessment by Content Domain, Cognitive Domain, and Item Format

TIMSS Assessment Items	Multiple-Choice Items	Constructed Response Items	Total Items	Percentage of Score Points
Content Domain				
Number	46 (46)	43 (49)	89 (95)	52%
Geometric Shapes and Measures	35 (35)	21 (24)	56 (59)	32%
Data Display	8 (8)	16 (20)	24 (28)	15%
Total	89 (89)	80 (93)	169 (182)	100%
Percentage of Score Points	49%	51%		
Cognitive Domain				
Knowing	37 (37)	27 (28)	64 (65)	36%
Applying	36 (36)	36 (44)	72 (80)	44%
Reasoning	16 (16)	17 (21)	33 (37)	20%
Total	89 (89)	80 (93)	169 (182)	100%
Percentage of Score Points	49%	51%		

TIMSS Numeracy Assessment Items	Multiple-Choice Items	Constructed Response Items	Total Items	Percentage of Score Points
Content Domain				
Whole Numbers	21 (21)	31 (32)	52 (53)	50%
Fractions and Decimals	7 (7)	8 (8)	15 (15)	14%
Shapes and Measures	18 (18)	17 (20)	35 (38)	36%
Total	46 (46)	56 (60)	102 (106)	100%
Percentage of Score Points	43%	57%		
Cognitive Domain				
Knowing	30 (30)	25 (25)	55 (55)	52%
Applying	11 (11)	24 (25)	35 (36)	34%
Reasoning	5 (5)	7 (10)	12 (15)	14%
Total	46 (46)	56 (60)	102 (106)	100%
Percentage of Score Points	43%	57%		

Counts of TIMSS Numeracy achievement items do not include the two fourth grade TIMSS 2015 mathematics blocks (see Chapter 4 of the *TIMSS 2015 Assessment Frameworks*).

Score points are shown in parentheses.

Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix B.2: Distribution of Items Included in the Assessment by Content Domain, Cognitive Domain, and Item Format

TIMSS Assessment Items	Multiple-Choice Items	Constructed Response Items	Total Items	Percentage of Score Points
Content Domain				
Number	29 (29)	35 (41)	64 (70)	31%
Algebra	35 (35)	27 (30)	62 (65)	28%
Geometry	22 (22)	21 (25)	43 (47)	21%
Data and Chance	29 (31)	14 (16)	43 (47)	21%
Total	115 (117)	97 (112)	212 (229)	100%
Percentage of Score Points	51%	49%		
Cognitive Domain				
Knowing	50 (50)	19 (20)	69 (70)	31%
Applying	48 (48)	47 (55)	95 (103)	45%
Reasoning	17 (19)	31 (37)	48 (56)	24%
Total	115 (117)	97 (112)	212 (229)	100%
Percentage of Score Points	51%	49%		

Score points are shown in parentheses.
Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix C.1: Coverage of TIMSS 2015 Target Population

Country	International Target Population		Exclusions from National Target Population		
	Coverage	Notes on Coverage	School-Level Exclusions	Within-Sample Exclusions	Overall Exclusions
Australia	100%		2.1%	2.1%	4.2%
[2] Bahrain	100%		0.4%	5.1%	5.6%
Belgium (Flemish)	100%		0.2%	1.2%	1.4%
Bulgaria	100%		1.2%	1.7%	2.9%
[1] [2] Canada	79%	Students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec	2.5%	3.6%	6.1%
Chile	100%		1.9%	1.8%	3.7%
Chinese Taipei	100%		0.1%	2.3%	2.4%
Croatia	100%		1.5%	2.9%	4.4%
Cyprus	100%		1.0%	3.6%	4.6%
Czech Republic	100%		3.5%	0.7%	4.2%
[2] Denmark	100%		0.9%	6.6%	7.5%
England	100%		2.1%	0.2%	2.3%
Finland	100%		1.3%	0.7%	2.0%
France	100%		4.7%	0.6%	5.3%
[1] Georgia	90%	Students taught in Georgian	2.1%	2.7%	4.9%
Germany	100%		1.4%	1.3%	2.7%
Hong Kong SAR	100%		1.1%	1.1%	2.2%
Hungary	100%		2.3%	2.5%	4.8%
Indonesia	100%		0.2%	0.0%	0.2%
Iran, Islamic Rep. of	100%		3.9%	0.0%	4.0%
Ireland	100%		1.7%	1.0%	2.7%
[2] Italy	100%		0.9%	5.3%	6.2%
Japan	100%		0.6%	2.4%	2.9%
Jordan	100%		0.0%	1.2%	1.2%
Kazakhstan	100%		3.5%	0.4%	3.9%
Korea, Rep. of	100%		1.2%	1.3%	2.5%
Kuwait	100%		2.5%	0.5%	3.0%
[2] Lithuania	100%		2.5%	3.6%	6.1%
Morocco	100%		1.5%	0.0%	1.5%
Netherlands	100%		2.4%	0.8%	3.2%
New Zealand	100%		2.8%	2.1%	4.8%
Northern Ireland	100%		2.6%	0.1%	2.7%
Norway (5)	100%		1.1%	3.6%	4.7%
Oman	100%		0.1%	0.7%	0.8%
Poland	100%		1.4%	2.6%	4.0%
[2] Portugal	100%		1.0%	5.5%	6.5%
Qatar	100%		1.6%	2.2%	3.8%
Russian Federation	100%		1.9%	2.0%	4.0%
Saudi Arabia	100%		1.9%	0.0%	1.9%
[3] Serbia	100%		5.0%	6.3%	11.3%
[2] Singapore	100%		10.1%	0.0%	10.1%
Slovak Republic	100%		3.2%	1.0%	4.2%
Slovenia	100%		2.9%	1.6%	4.5%
South Africa (5)	100%		1.6%	0.6%	2.2%
[2] Spain	100%		1.6%	4.1%	5.6%
[2] Sweden	100%		1.7%	4.0%	5.7%
Turkey	100%		2.2%	1.4%	3.6%
United Arab Emirates	100%		2.0%	2.7%	4.7%
[2] United States	100%		0.0%	6.8%	6.8%

1 National Target Population does not include all of the International Target Population.
2 National Defined Population covers 90% to 95% of the National Target Population.
3 National Defined Population covers less than 90% of the National Target population (but at least 77%).

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix C.1: Coverage of TIMSS 2015 Target Population (Continued)

Country	International Target Population		Exclusions from National Target Population		
	Coverage	Notes on Coverage	School-Level Exclusions	Within-Sample Exclusions	Overall Exclusions
Benchmarking Participants					
Buenos Aires, Argentina	100%		1.7%	0.2%	1.9%
Ontario, Canada	100%		2.2%	1.3%	3.4%
Quebec, Canada	100%		3.2%	2.2%	5.4%
Norway (4)	100%		1.5%	3.5%	5.0%
[2] Abu Dhabi, UAE	100%		1.5%	4.3%	5.8%
Dubai, UAE	100%		3.3%	2.0%	5.3%
[1] Florida, US	90%	Students from public schools	0.0%	4.7%	4.7%

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix C.2: Coverage of TIMSS 2015 Target Population

Country	International Target Population		Exclusions from National Target Population		
	Coverage	Notes on Coverage	School-Level Exclusions	Within-Sample Exclusions	Overall Exclusions
Australia	100%		1.3%	2.2%	3.5%
Bahrain	100%		0.3%	3.5%	3.8%
Botswana (9)	100%		0.0%	0.3%	0.3%
[1] Canada	67%	Students from the provinces of Manitoba, Newfoundland, Ontario, and Quebec	2.5%	2.4%	4.8%
Chile	100%		1.4%	0.5%	1.9%
Chinese Taipei	100%		0.1%	1.6%	1.7%
Egypt	100%		0.1%	0.0%	0.1%
England	100%		2.3%	0.0%	2.3%
[1] [2] Georgia	90%	Students taught in Georgian	2.3%	3.7%	6.0%
Hong Kong SAR	100%		1.3%	0.4%	1.6%
Hungary	100%		2.6%	2.9%	5.4%
Iran, Islamic Rep. of	100%		0.5%	1.7%	2.2%
Ireland	100%		0.3%	0.9%	1.2%
[3] Israel	100%		17.6%	5.3%	22.8%
[2] Italy	100%		0.8%	5.3%	6.1%
Japan	100%		0.8%	1.5%	2.3%
Jordan	100%		0.0%	1.0%	1.0%
Kazakhstan	100%		3.0%	0.8%	3.8%
Korea, Rep. of	100%		1.2%	0.9%	2.1%
Kuwait	100%		2.8%	0.5%	3.3%
Lebanon	100%		1.3%	0.0%	1.3%
[2] Lithuania	100%		3.9%	3.0%	7.0%
Malaysia	100%		1.1%	3.2%	4.3%
Malta	100%		1.9%	1.6%	3.5%
Morocco	100%		0.0%	0.0%	0.0%
New Zealand	100%		1.6%	1.5%	3.1%
Norway (9)	100%		1.0%	2.7%	3.7%
Oman	100%		0.1%	0.3%	0.4%
Qatar	100%		1.7%	1.5%	3.2%
Russian Federation	100%		2.3%	1.4%	3.7%
Saudi Arabia	100%		1.9%	0.2%	2.1%
[2] Singapore	100%		7.0%	0.0%	7.0%
Slovenia	100%		2.1%	1.7%	3.8%
South Africa (9)	100%		1.5%	0.0%	1.5%
Sweden	100%		1.8%	3.6%	5.5%
Thailand	100%		0.2%	0.0%	0.2%
Turkey	100%		0.2%	1.1%	1.3%
United Arab Emirates	100%		2.2%	1.5%	3.6%
United States	100%		0.0%	5.1%	5.1%
Benchmarking Participants					
Buenos Aires, Argentina	100%		2.7%	0.0%	2.7%
Ontario, Canada	100%		1.8%	0.8%	2.5%
Quebec, Canada	100%		3.6%	1.7%	5.3%
Norway (8)	100%		1.4%	2.7%	4.1%
Abu Dhabi, UAE	100%		1.8%	2.3%	4.1%
Dubai, UAE	100%		3.6%	1.6%	5.2%
[1] Florida, US	90%	Students from public schools	0.0%	2.8%	2.8%

1 National Target Population does not include all of the International Target Population.
2 National Defined Population covers 90% to 95% of the National Target Population.
3 National Defined Population covers less than 90% of the National Target population (but at least 77%).

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix C.3: School Sample Sizes

Country	Number of Schools in Original Sample	Number of Eligible Schools in Original Sample	Number of Schools in Original Sample that Participated	Number of Replacement Schools that Participated	Total Number of Schools that Participated
Australia	290	289	285	2	287
Bahrain	182	182	182	0	182
Belgium (Flemish)	160	157	117	36	153
Bulgaria	154	153	148	1	149
Canada	520	513	403	38	441
Chile	190	189	161	18	179
Chinese Taipei	150	150	149	1	150
Croatia	168	163	161	2	163
Cyprus	150	148	148	0	148
Czech Republic	160	159	159	0	159
Denmark	220	212	113	80	193
England	150	150	142	5	147
Finland	160	158	157	1	158
France	166	165	159	5	164
Georgia	162	153	151	2	153
Germany	210	208	199	5	204
Hong Kong SAR	160	160	123	9	132
Hungary	150	145	143	1	144
Indonesia	230	230	230	0	230
Iran, Islamic Rep. of	250	248	248	0	248
Ireland	149	149	149	0	149
Italy	166	166	136	28	164
Japan	150	149	143	5	148
Jordan	257	254	254	0	254
Kazakhstan	176	175	165	6	171
Korea, Rep. of	150	149	149	0	149
Kuwait	176	175	166	0	166
Lithuania	231	225	223	2	225
Morocco	361	359	358	0	358
Netherlands	150	148	74	55	129
New Zealand	182	182	147	27	174
Northern Ireland	154	154	100	18	118
Norway (5)	150	150	140	0	140
Oman	308	305	296	4	300
Poland	150	150	137	13	150
Portugal	222	221	193	24	217
Qatar	220	211	211	0	211
Russian Federation	208	208	208	0	208
Saudi Arabia	198	189	178	11	189
Serbia	160	160	158	2	160
Singapore	179	179	179	0	179
Slovak Republic	200	199	193	5	198
Slovenia	150	150	144	4	148
South Africa (5)	300	297	293	4	297
Spain	364	363	357	1	358
Sweden	150	144	144	0	144
Turkey	260	242	242	0	242
United Arab Emirates	573	558	558	0	558
United States	300	295	228	22	250
Benchmarking Participants					
Buenos Aires, Argentina	150	150	127	9	136
Ontario, Canada	160	158	151	0	151
Quebec, Canada	176	174	101	20	121
Norway (4)	152	148	139	0	139
Abu Dhabi, UAE	173	163	163	0	163
Dubai, UAE	170	168	168	0	168
Florida, US	54	53	53	0	53

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix C.4: School Sample Sizes

Country	Number of Schools in Original Sample	Number of Eligible Schools in Original Sample	Number of Schools in Original Sample that Participated	Number of Replacement Schools that Participated	Total Number of Schools that Participated
Australia	290	287	285	0	285
Bahrain	105	105	105	0	105
Botswana (9)	159	159	159	0	159
Canada	344	337	253	23	276
Chile	184	184	154	17	171
Chinese Taipei	190	190	190	0	190
Egypt	214	214	197	14	211
England	150	148	135	8	143
Georgia	162	153	151	2	153
Hong Kong SAR	158	158	123	10	133
Hungary	150	145	140	4	144
Iran, Islamic Rep. of	250	250	250	0	250
Ireland	150	150	149	0	149
Israel	200	200	182	18	200
Italy	165	165	133	28	161
Japan	150	149	142	5	147
Jordan	260	252	252	0	252
Kazakhstan	176	176	168	4	172
Korea, Rep. of	150	150	150	0	150
Kuwait	178	177	168	0	168
Lebanon	150	150	116	22	138
Lithuania	211	208	204	4	208
Malaysia	212	207	207	0	207
Malta	48	48	48	0	48
Morocco	353	345	345	0	345
New Zealand	162	162	120	25	145
Norway (9)	150	150	143	0	143
Oman	310	308	300	1	301
Qatar	136	134	131	0	131
Russian Federation	204	204	204	0	204
Saudi Arabia	154	143	140	3	143
Singapore	167	167	167	0	167
Slovenia	150	150	144	4	148
South Africa (9)	300	292	282	10	292
Sweden	154	150	149	1	150
Thailand	204	204	200	4	204
Turkey	240	218	218	0	218
United Arab Emirates	489	477	477	0	477
United States	300	293	229	17	246
Benchmarking Participants					
Buenos Aires, Argentina	150	150	122	6	128
Ontario, Canada	152	147	135	3	138
Quebec, Canada	176	174	102	20	122
Norway (8)	150	150	142	0	142
Abu Dhabi, UAE	165	156	156	0	156
Dubai, UAE	137	135	135	0	135
Florida, US	54	54	53	0	53

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix C.5: Student Sample Sizes

Country	Within-School Student Participation (Weighted Percentage)	Number of Sampled Students in Participating Schools	Number of Students Withdrawn from Class/School	Number of Students Excluded	Number of Eligible Students	Number of Students Absent	Number of Students Assessed
Australia	95%	6,705	149	129	6,427	370	6,057
Bahrain (Combined)	99%	9,335	63	540	8,732	157	8,575
Numeracy	99%	4,825	38	277	4,510	81	4,429
TIMSS	99%	4,510	25	263	4,222	76	4,146
Belgium (Flemish)	98%	5,580	24	32	5,524	120	5,404
Bulgaria	96%	4,563	78	80	4,405	177	4,228
Canada	94%	13,583	118	294	13,171	888	12,283
Chile	94%	5,196	68	64	5,064	308	4,756
Chinese Taipei	99%	4,461	37	84	4,340	49	4,291
Croatia	95%	4,354	25	109	4,220	235	3,985
Cyprus	98%	4,343	12	132	4,199	74	4,125
Czech Republic	95%	5,562	41	31	5,490	288	5,202
Denmark	95%	4,213	57	241	3,915	205	3,710
England	98%	4,232	117	0	4,115	109	4,006
Finland	97%	5,251	17	34	5,200	185	5,015
France	98%	5,110	66	35	5,009	136	4,873
Georgia	98%	4,091	30	59	4,002	83	3,919
Germany	96%	4,202	44	45	4,113	165	3,948
Hong Kong SAR	93%	3,936	17	45	3,874	274	3,600
Hungary	97%	5,329	24	102	5,203	167	5,036
Indonesia (Combined)	99%	8,730	207	0	8,523	204	8,319
Numeracy	99%	4,522	118	0	4,404	110	4,294
TIMSS	99%	4,208	89	0	4,119	94	4,025
Iran, Islamic Rep. of (Combined)	99%	8,115	77	3	8,035	107	7,928
Numeracy	99%	4,203	35	2	4,166	61	4,105
TIMSS	99%	3,912	42	1	3,869	46	3,823
Ireland	96%	4,624	31	52	4,541	197	4,344
Italy	95%	4,859	18	264	4,577	204	4,373
Japan	98%	4,511	7	35	4,469	86	4,383
Jordan	96%	8,514	276	0	8,238	377	7,861
Kazakhstan	98%	4,830	51	0	4,779	77	4,702
Korea, Rep. of	97%	4,903	54	54	4,795	126	4,669
Kuwait (Combined)	96%	7,991	79	4	7,908	612	7,296
Numeracy	95%	4,128	38	2	4,088	385	3,703
TIMSS	97%	3,863	41	2	3,820	227	3,593
Lithuania	94%	5,034	12	175	4,847	318	4,529
Morocco (Combined)	99%	10,795	84	0	10,711	283	10,428
Numeracy	98%	5,581	43	0	5,538	178	5,360
TIMSS	99%	5,214	41	0	5,173	105	5,068
Netherlands	96%	4,791	77	20	4,694	179	4,515
New Zealand	94%	6,920	118	77	6,725	403	6,322
Northern Ireland	93%	3,388	17	2	3,369	253	3,116
Norway (5)	95%	4,764	27	166	4,571	242	4,329
Oman	99%	9,490	131	84	9,275	170	9,105
Poland	92%	5,346	49	118	5,179	432	4,747
Portugal	93%	5,391	33	295	5,063	370	4,693
Qatar	99%	5,484	116	113	5,255	61	5,194
Russian Federation	98%	5,145	24	87	5,034	113	4,921
Saudi Arabia	93%	4,759	74	2	4,683	346	4,337
Serbia	96%	4,310	21	80	4,209	173	4,036
Singapore	96%	6,800	26	0	6,774	257	6,517
Slovak Republic	97%	6,235	208	50	5,977	204	5,773
Slovenia	95%	4,790	13	77	4,700	255	4,445
South Africa (5)	98%	11,305	151	0	11,154	222	10,932
Spain	96%	8,353	40	302	8,011	247	7,764
Sweden	95%	4,505	29	126	4,350	208	4,142
Turkey	98%	6,892	217	90	6,585	129	6,456
United Arab Emirates	97%	22,249	110	275	21,864	687	21,177
United States	96%	11,267	147	648	10,472	443	10,029

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Students attending a sampled class at the time the sample was chosen but leaving the class before the assessment was administered were classified as "withdrawn."
Students with a disability or language barrier that prevented them from participating in the assessment were classified as "excluded."
Students not present when the assessment was administered, and not subsequently assessed in a make-up session, were classified as "absent."

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Appendix C.5: Student Sample Sizes (Continued)

Country	Within-School Student Participation (Weighted Percentage)	Number of Sampled Students in Participating Schools	Number of Students Withdrawn from Class/School	Number of Students Excluded	Number of Eligible Students	Number of Students Absent	Number of Students Assessed
Benchmarking Participants							
Buenos Aires, Argentina (Combined)	93%	7,464	54	16	7,180	745	6,435
Numeracy	93%	3,852	27	8	3,697	366	3,331
TIMSS	93%	3,612	27	8	3,483	379	3,104
Ontario, Canada	95%	4,938	52	59	4,827	253	4,574
Quebec, Canada	95%	3,012	13	54	2,945	147	2,798
Norway (4)	95%	4,583	27	149	4,407	243	4,164
Abu Dhabi, UAE	97%	5,281	32	64	5,185	184	5,001
Dubai, UAE	97%	7,906	35	153	7,718	265	7,453
Florida, US	95%	2,269	55	76	2,138	113	2,025

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix C.6: Student Sample Sizes

Country	Within-School Student Participation (Weighted Percentage)	Number of Sampled Students in Participating Schools	Number of Students Withdrawn from Class/School	Number of Students Excluded	Number of Eligible Students	Number of Students Absent	Number of Students Assessed
Australia	91%	11,968	312	88	11,568	1,230	10,338
Bahrain	97%	5,334	66	201	5,067	149	4,918
Botswana (9)	98%	6,192	66	12	6,114	150	5,964
Canada	93%	9,618	70	139	9,409	652	8,757
Chile	93%	5,285	67	21	5,197	348	4,849
Chinese Taipei	98%	5,915	53	50	5,812	101	5,711
Egypt	91%	8,897	273	0	8,624	802	7,822
England	95%	5,252	185	0	5,067	253	4,814
Georgia	98%	4,215	28	46	4,141	106	4,035
Hong Kong SAR	96%	4,363	24	13	4,326	171	4,155
Hungary	97%	5,190	20	112	5,058	165	4,893
Iran, Islamic Rep. of	98%	6,482	80	177	6,225	95	6,130
Ireland	92%	5,214	44	47	5,123	419	4,704
Israel	93%	6,079	41	102	5,936	424	5,512
Italy	95%	5,021	16	282	4,723	242	4,481
Japan	95%	5,037	8	12	5,017	272	4,745
Jordan	96%	8,617	441	0	8,176	311	7,865
Kazakhstan	98%	5,040	61	0	4,979	92	4,887
Korea, Rep. of	98%	5,526	35	55	5,436	127	5,309
Kuwait	90%	5,081	113	0	4,968	465	4,503
Lebanon	96%	4,044	24	0	4,020	147	3,873
Lithuania	93%	4,864	27	148	4,689	342	4,347
Malaysia	98%	10,092	171	41	9,880	154	9,726
Malta	96%	4,063	15	67	3,981	164	3,817
Morocco	95%	13,979	229	0	13,750	715	13,035
New Zealand	90%	9,119	93	47	8,979	837	8,142
Norway (9)	91%	5,354	37	128	5,189	492	4,697
Oman	99%	9,218	161	21	9,036	153	8,883
Qatar	98%	5,691	115	73	5,503	100	5,403
Russian Federation	97%	5,025	52	59	4,914	134	4,780
Saudi Arabia	97%	3,962	72	5	3,885	126	3,759
Singapore	97%	6,341	15	0	6,326	210	6,116
Slovenia	94%	4,654	17	76	4,561	304	4,257
South Africa (9)	96%	13,708	574	0	13,134	620	12,514
Sweden	94%	4,561	43	121	4,397	307	4,090
Thailand	99%	6,761	179	0	6,582	100	6,482
Turkey	98%	6,537	232	71	6,234	155	6,079
United Arab Emirates	97%	18,740	78	106	18,556	544	18,012
United States	94%	11,489	198	439	10,852	631	10,221
Benchmarking Participants							
Buenos Aires, Argentina	85%	3,839	81	0	3,758	505	3,253
Ontario, Canada	93%	4,883	18	24	4,841	321	4,520
Quebec, Canada	92%	4,403	48	92	4,263	313	3,950
Norway (8)	93%	5,339	17	143	5,179	384	4,795
Abu Dhabi, UAE	98%	5,021	26	20	4,975	137	4,838
Dubai, UAE	97%	6,435	24	67	6,344	195	6,149
Florida, US	93%	2,336	38	47	2,251	177	2,074

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Students attending a sampled class at the time the sample was chosen but leaving the class before the assessment was administered were classified as "withdrawn."
Students with a disability or language barrier that prevented them from participating in the assessment were classified as "excluded."
Students not present when the assessment was administered, and not subsequently assessed in a make-up session, were classified as "absent."

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Appendix C.7: Participation Rates (Weighted)

Country	School Participation		Class Participation	Student Participation	Overall Participation	
	Before Replacement	After Replacement			Before Replacement	After Replacement
Australia	98%	99%	100%	95%	94%	94%
Bahrain (Combined)	100%	100%	100%	99%	99%	99%
Numeracy	100%	100%	100%	99%	99%	99%
TIMSS	100%	100%	100%	99%	99%	99%
† Belgium (Flemish)	74%	97%	100%	98%	73%	95%
Bulgaria	97%	97%	100%	96%	93%	93%
† Canada	80%	86%	99%	94%	74%	80%
Chile	87%	94%	100%	94%	82%	88%
Chinese Taipei	99%	100%	100%	99%	98%	99%
Croatia	99%	100%	99%	95%	93%	94%
Cyprus	100%	100%	100%	98%	98%	98%
Czech Republic	100%	100%	100%	95%	95%	95%
† Denmark	53%	91%	100%	95%	50%	86%
England	95%	98%	100%	98%	92%	96%
Finland	99%	100%	100%	97%	95%	97%
France	96%	99%	100%	98%	93%	97%
Georgia	99%	100%	100%	98%	97%	98%
Germany	97%	99%	100%	96%	93%	95%
† Hong Kong SAR	76%	82%	100%	93%	70%	76%
Hungary	99%	99%	100%	97%	96%	96%
Indonesia (Combined)	100%	100%	100%	99%	99%	99%
Numeracy	100%	100%	100%	99%	99%	99%
TIMSS	100%	100%	100%	99%	99%	99%
Iran, Islamic Rep. of (Combined)	100%	100%	100%	99%	99%	99%
Numeracy	100%	100%	100%	99%	99%	99%
TIMSS	100%	100%	100%	99%	99%	99%
Ireland	100%	100%	100%	96%	96%	96%
Italy	80%	99%	99%	95%	75%	94%
Japan	96%	99%	100%	98%	94%	97%
Jordan	100%	100%	100%	96%	96%	96%
Kazakhstan	97%	99%	100%	98%	95%	97%
Korea, Rep. of	100%	100%	100%	97%	97%	97%
Kuwait (Combined)	94%	94%	100%	96%	90%	90%
Numeracy	94%	94%	100%	95%	89%	89%
TIMSS	94%	94%	100%	97%	90%	90%
Lithuania	99%	100%	100%	94%	93%	94%
Morocco (Combined)	100%	100%	100%	99%	99%	99%
Numeracy	100%	100%	100%	98%	98%	98%
TIMSS	100%	100%	100%	99%	99%	99%
† Netherlands	48%	87%	100%	96%	46%	83%
New Zealand	81%	96%	100%	94%	76%	90%
‡ Northern Ireland	65%	76%	100%	93%	60%	71%
Norway (5)	93%	93%	100%	95%	89%	89%
Oman	97%	98%	100%	99%	96%	97%
Poland	91%	100%	100%	92%	84%	92%
Portugal	89%	99%	100%	93%	83%	92%
Qatar	100%	100%	100%	99%	99%	99%
Russian Federation	100%	100%	100%	98%	98%	98%
Saudi Arabia	95%	100%	100%	93%	88%	93%
Serbia	99%	100%	100%	96%	95%	96%
Singapore	100%	100%	100%	96%	96%	96%
Slovak Republic	98%	100%	100%	97%	95%	97%
Slovenia	96%	99%	100%	95%	91%	93%
South Africa (5)	99%	100%	100%	98%	98%	98%
Spain	98%	99%	100%	96%	95%	95%
Sweden	100%	100%	100%	95%	95%	95%
Turkey	100%	100%	100%	98%	98%	98%
United Arab Emirates	100%	100%	100%	97%	97%	97%
† United States	77%	85%	100%	96%	74%	81%

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

TIMSS guidelines for sampling participation: The minimum acceptable participation rates were 85 percent of both schools and students, or a combined rate (the product of school and student participation) of 75 percent. Participants not meeting these guidelines were annotated as follows:

† Met guidelines for sample participation rates only after replacement schools were included.

‡ Nearly satisfied guidelines for sample participation rates after replacement schools were included.

‡ Did not satisfy guidelines for sample participation rates.

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Appendix C.7: Participation Rates (Weighted) (Continued)

Country	School Participation		Class Participation	Student Participation	Overall Participation	
	Before Replacement	After Replacement			Before Replacement	After Replacement
Benchmarking Participants						
Buenos Aires, Argentina (Combined)	86%	91%	93%	93%	74%	79%
Numeracy	86%	91%	93%	93%	74%	79%
TIMSS	86%	91%	93%	93%	75%	79%
Ontario, Canada	95%	95%	100%	95%	90%	90%
‡ Quebec, Canada	48%	62%	100%	95%	46%	59%
Norway (4)	94%	94%	100%	95%	89%	89%
Abu Dhabi, UAE	100%	100%	100%	97%	97%	97%
Dubai, UAE	100%	100%	100%	97%	97%	97%
Florida, US	100%	100%	100%	95%	95%	95%

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix C.8: Participation Rates (Weighted)

Country	School Participation		Class Participation	Student Participation	Overall Participation	
	Before Replacement	After Replacement			Before Replacement	After Replacement
Australia	99%	99%	99%	91%	90%	90%
Bahrain	100%	100%	100%	97%	97%	97%
Botswana (9)	100%	100%	100%	98%	98%	98%
† Canada	80%	85%	99%	93%	73%	78%
Chile	85%	92%	100%	93%	79%	85%
Chinese Taipei	100%	100%	100%	98%	98%	98%
Egypt	95%	100%	100%	91%	87%	91%
England	91%	97%	100%	95%	87%	92%
Georgia	99%	100%	100%	98%	97%	98%
Hong Kong SAR	78%	84%	100%	96%	74%	81%
Hungary	96%	99%	100%	97%	93%	96%
Iran, Islamic Rep. of	100%	100%	100%	98%	98%	98%
Ireland	99%	99%	100%	92%	91%	91%
Israel	91%	100%	100%	93%	84%	93%
Italy	78%	98%	100%	95%	74%	93%
Japan	95%	99%	100%	95%	90%	93%
Jordan	100%	100%	100%	96%	96%	96%
Kazakhstan	97%	99%	100%	98%	95%	97%
Korea, Rep. of	100%	100%	100%	98%	98%	98%
Kuwait	94%	94%	100%	90%	85%	85%
Lebanon	77%	92%	100%	96%	74%	88%
Lithuania	99%	100%	100%	93%	92%	93%
Malaysia	100%	100%	100%	98%	98%	98%
Malta	100%	100%	100%	96%	96%	96%
Morocco	100%	100%	100%	95%	95%	95%
† New Zealand	76%	90%	100%	90%	68%	81%
Norway (9)	96%	96%	100%	91%	87%	87%
Oman	97%	97%	100%	99%	96%	96%
Qatar	98%	98%	100%	98%	96%	96%
Russian Federation	100%	100%	100%	97%	97%	97%
Saudi Arabia	98%	100%	100%	97%	95%	97%
Singapore	100%	100%	100%	97%	97%	97%
Slovenia	96%	99%	100%	94%	89%	92%
South Africa (9)	98%	100%	100%	96%	94%	96%
Sweden	97%	100%	100%	94%	91%	94%
Thailand	98%	100%	100%	99%	96%	99%
Turkey	100%	100%	100%	98%	98%	98%
United Arab Emirates	100%	100%	100%	97%	97%	97%
† United States	78%	84%	99%	94%	73%	78%
Benchmarking Participants						
† Buenos Aires, Argentina	81%	85%	98%	85%	68%	71%
Ontario, Canada	93%	94%	99%	93%	85%	87%
‡ Quebec, Canada	50%	63%	99%	92%	46%	58%
Norway (8)	95%	95%	100%	93%	87%	87%
Abu Dhabi, UAE	100%	100%	100%	98%	98%	98%
Dubai, UAE	100%	100%	100%	97%	97%	97%
Florida, US	98%	98%	99%	93%	90%	90%

TIMSS guidelines for sampling participation: The minimum acceptable participation rates were 85 percent of both schools and students, or a combined rate (the product of school and student participation) of 75 percent. Participants not meeting these guidelines were annotated as follows:

† Met guidelines for sample participation rates only after replacement schools were included.

‡ Nearly satisfied guidelines for sample participation rates after replacement schools were included.

‡ Did not satisfy guidelines for sample participation rates.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix C.9: Trends in Student Populations

Country	Years of Formal Schooling*					Average Age at Time of Testing				
	2015	2011	2007	2003	1995	2015	2011	2007	2003	1995
Australia	4	4	4	4	4	10.0	10.0	9.9	9.9	9.9
Bahrain	4	4				9.9	10.4			
Belgium (Flemish)	4	4		4		10.1	10.0		10.0	
Chile	4	4				10.2	10.1			
Chinese Taipei	4	4	4	4		10.2	10.2	10.2	10.2	
Croatia	4	4				10.6	10.7			
Cyprus	4			4	4	9.8			9.9	9.8
Czech Republic	4	4	4		4	10.4	10.4	10.3		10.4
Denmark	4	4	4			10.9	11.0	11.0		
England	5	5	5	5	5	10.1	10.2	10.2	10.3	10.0
Finland	4	4				10.8	10.8			
Georgia	4	4	4			9.7	10.0	10.1		
Germany	4	4	4			10.4	10.4	10.4		
Hong Kong SAR	4	4	4	4	4	10.1	10.1	10.2	10.2	10.1
Hungary	4	4	4	4	4	10.7	10.7	10.7	10.5	10.4
Iran, Islamic Rep. of	4	4	4	4	4	10.2	10.2	10.2	10.4	10.5
Ireland	4	4			4	10.4	10.3			10.3
Italy	4	4	4	4		9.7	9.7	9.8	9.8	
Japan	4	4	4	4	4	10.5	10.5	10.5	10.4	10.4
Kazakhstan	4	4				10.3	10.4			
Korea, Rep. of	4	4			4	10.5	10.4			10.3
Kuwait	4	4				9.7	9.7			
Lithuania	4	4	4	4		10.7	10.7	10.8	10.9	
Morocco	4	4				10.3	10.5			
Netherlands	4	4	4	4	4	10.0	10.2	10.2	10.2	10.3
New Zealand	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	10.0	9.9	10.0	10.0	10.0
Northern Ireland	4	4				10.4	10.4			
Oman	4	4				9.6	9.9			
Portugal	4	4			4	9.9	10.0			10.4
Qatar	4	4				10.1	10.0			
Russian Federation	4	4	4	3 or 4		10.8	10.8	10.8	10.6	
Saudi Arabia	4	4				10.0	10.0			
Serbia	4	4				10.7	10.8			
Singapore	4	4	4	4	4	10.4	10.4	10.4	10.3	10.3
Slovak Republic	4	4	4			10.4	10.4	10.4		
Slovenia	4	4	4	3 or 4	3	9.8	9.9	9.8	9.8	9.9
Spain	4	4				9.9	9.8			
Sweden	4	4	4			10.8	10.7	10.8		
Turkey	4	4				9.9	10.1			
United Arab Emirates	4	4				9.8	9.8			
United States	4	4	4	4	4	10.2	10.2	10.3	10.2	10.2
Benchmarking Participants										
Ontario, Canada	4	4	4	4	4	9.8	9.8	9.8	9.9	9.8
Quebec, Canada	4	4	4	4	4	10.1	10.1	10.1	10.1	10.3
Norway (4)	4	4	4	3	3	9.7	9.7	9.8	9.8	9.9
Abu Dhabi, UAE	4	4				9.8	9.7			
Dubai, UAE	4	4	4			9.8	9.9	10.0		
Florida, US	4	4				10.4	10.4			

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

* Represents years of schooling counting from the first year of ISCED Level 1.

Georgian schools in South Ossetia and Abkhazia were excluded in 2011 due to lack of access and absence of official statistics. Abkhazia refugee schools in other territories of Georgia were included in the sample frame.

Bahrain in 2011, Korea in 2003, Lithuania in 1999, and Dubai (UAE) in 2007 tested the same cohort of students as other countries, but later in the assessment year. South Africa (9) tested one year later.

Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish or in Russian.

An empty cell indicates a country did not participate in that year's assessment. A dash (–) indicates comparable data not available.

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Appendix C.9: Trends in Student Populations (Continued)

Country	Overall Exclusion Rates					Overall Participation Rates (After Replacement)				
	2015	2011	2007	2003	1995	2015	2011	2007	2003	1995
Australia	4.2%	4.4%	4.0%	2.7%	2.0%	94%	93%	95%	85%	66%
Bahrain	5.6%	1.1%				99%	90%			
Belgium (Flemish)	1.4%	5.0%		6.3%		95%	92%		97%	
Chile	3.7%	3.7%				88%	95%			
Chinese Taipei	2.4%	1.4%	2.8%	3.1%		99%	99%	100%	99%	
Croatia	4.4%	7.9%				94%	95%			
Cyprus	4.6%			2.9%	3.0%	98%			97%	83%
Czech Republic	4.2%	5.1%	4.9%		4.0%	95%	94%	92%		86%
Denmark	7.5%	6.3%	4.1%			86%	87%	85%		
England	2.3%	2.0%	2.1%	1.9%	12.0%	96%	78%	84%	76%	83%
Finland	2.0%	3.1%				97%	96%			
Georgia	4.9%	4.9%	4.8%			98%	96%	98%		
Germany	2.7%	1.9%	1.3%			95%	95%	96%		
Hong Kong SAR	2.2%	8.6%	5.4%	3.8%	3.0%	76%	82%	81%	83%	83%
Hungary	4.8%	4.2%	4.4%	8.1%	4.0%	96%	96%	96%	93%	92%
Iran, Islamic Rep. of	4.0%	4.5%	3.0%	5.7%	1.0%	99%	99%	99%	98%	97%
Ireland	2.7%	2.5%			7.0%	96%	95%			90%
Italy	6.2%	3.7%	5.3%	4.2%		94%	95%	97%	97%	
Japan	2.9%	3.2%	1.1%	0.8%	3.0%	97%	96%	95%	97%	92%
Kazakhstan	3.9%	6.3%				97%	99%			
Korea, Rep. of	2.5%	2.5%			7.0%	97%	98%			95%
Kuwait	3.0%	0.3%				90%	91%			
Lithuania	6.1%	5.6%	5.4%	4.6%		94%	94%	94%	87%	
Morocco	1.5%	2.0%				99%	96%			
Netherlands	3.2%	4.0%	4.8%	5.2%	4.0%	83%	79%	91%	84%	59%
New Zealand	4.8%	4.9%	5.4%	4.0%	1.0%	90%	90%	96%	93%	95%
Northern Ireland	2.7%	3.5%				71%	79%			
Oman	0.8%	1.5%				97%	96%			
Portugal	6.5%	2.5%			7.0%	92%	92%			92%
Qatar	3.8%	6.2%				99%	99%			
Russian Federation	4.0%	5.3%	3.6%	6.8%		98%	98%	98%	97%	
Saudi Arabia	1.9%	1.6%				93%	99%			
Serbia	11.3%	9.4%				96%	97%			
Singapore	10.1%	6.3%	1.5%	0.0%	0.0%	96%	96%	96%	98%	98%
Slovak Republic	4.2%	4.6%	3.3%			97%	96%	97%		
Slovenia	4.5%	2.6%	2.1%	1.3%	2.0%	93%	94%	93%	91%	76%
Spain	5.6%	5.3%				95%	97%			
Sweden	5.7%	4.1%	3.1%			95%	91%	97%		
Turkey	3.6%	2.5%				98%	98%			
United Arab Emirates	4.7%	3.3%				97%	97%			
United States	6.8%	7.0%	9.2%	5.1%	5.0%	81%	80%	84%	78%	80%
Benchmarking Participants										
Ontario, Canada	3.4%	5.3%	6.3%	4.8%	-	90%	94%	92%	90%	92%
Quebec, Canada	5.4%	3.7%	6.4%	3.6%	-	59%	91%	84%	91%	81%
Norway (4)	5.0%	4.3%	5.1%	4.4%	3.0%	89%	70%	92%	88%	91%
Abu Dhabi, UAE	5.8%	2.7%				97%	97%			
Dubai, UAE	5.3%	5.1%	5.4%			97%	96%	67%		
Florida, US	4.7%	12.1%				95%	91%			

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix C.10: Trends in Student Populations

Country	Years of Formal Schooling*						Average Age at Time of Testing					
	2015	2011	2007	2003	1999	1995	2015	2011	2007	2003	1999	1995
Australia	8	8	8	8		8	14.0	14.0	13.9	13.9		13.9
Bahrain	8	8	8	8			14.0	14.4	14.1	14.1		
Botswana (9)	9	9					15.6	15.8				
Chile	8	8		8	8		14.3	14.2		14.2	14.4	
Chinese Taipei	8	8	8	8	8		14.3	14.2	14.2	14.2	14.2	
Egypt	8		8	8			14.1		14.1	14.4		
England	9	9	9	9	9	9	14.1	14.2	14.2	14.3	14.2	14.0
Georgia	8	8	8				13.7	14.2	14.2			
Hong Kong SAR	8	8	8	8	8	8	14.2	14.2	14.4	14.4	14.2	14.2
Hungary	8	8	8	8	8	8	14.7	14.7	14.6	14.5	14.4	14.3
Iran, Islamic Rep. of	8	8	8	8	8	8	14.2	14.3	14.2	14.4	14.6	14.6
Ireland	8					8	14.4					14.4
Israel	8	8					14.0	14.0				
Italy	8	8	8	8	8		13.8	13.8	13.9	13.9	14.0	
Japan	8	8	8	8	8	8	14.5	14.5	14.5	14.4	14.4	14.4
Jordan	8	8	8	8	8		13.8	13.9	14.0	13.9	14.0	
Kazakhstan	8	8					14.3	14.6				
Korea, Rep. of	8	8	8	8	8	8	14.4	14.3	14.3	14.6	14.4	14.2
Kuwait	8		8				13.7		14.4			
Lebanon	8	8	8	8			14.2	14.3	14.4	14.6		
Lithuania	8	8	8	8	8.5	8	14.7	14.7	14.9	14.9	15.2	14.3
Malaysia	8	8	8	8	8		14.3	14.4	14.3	14.3	14.4	
Malta	8		9				13.8		14.0			
Morocco	8	8					14.5	14.7				
New Zealand	8.5 - 9.5	8.5 - 9.5		8.5 - 9.5	8.5 - 9.5	8.5 - 9.5	14.1	14.1		14.1	14.0	14.0
Oman	8	8	8				14.0	14.1	14.3			
Qatar	8	8					14.1	14.0				
Russian Federation	8	8	7 or 8	7 or 8	7 or 8	7 or 8	14.7	14.7	14.6	14.2	14.1	14.0
Saudi Arabia	8	8					14.1	14.1				
Singapore	8	8	8	8	8	8	14.4	14.4	14.4	14.3	14.4	14.5
Slovenia	8	8	7 or 8	7 or 8		7	13.8	13.9	13.8	13.8		13.8
South Africa (9)	9	9					15.7	16.0				
Sweden	8	8	8	8		7	14.7	14.8	14.8	14.9		14.9
Thailand	8	8	8		8		14.4	14.3	14.3		14.5	
Turkey	8	8					13.9	14.0				
United Arab Emirates	8	8					13.9	13.9				
United States	8	8	8	8	8	8	14.2	14.2	14.3	14.2	14.2	14.2
Benchmarking Participants												
Ontario, Canada	8	8	8	8	8	8	13.8	13.8	13.8	13.8	13.9	14.0
Quebec, Canada	8	8	8	8	8	8	14.3	14.2	14.2	14.2	14.3	14.5
Norway (8)	8	8	8	7		7	13.7	13.7	13.8	13.8		13.9
Abu Dhabi, UAE	8	8					13.9	13.8				
Dubai, UAE	8	8	8				13.9	13.9	14.2			
Florida, US	8	8					14.4	14.4				

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

* Represents years of schooling counting from the first year of ISCED Level 1.

Georgian schools in South Ossetia and Abkhazia were excluded in 2011 due to lack of access and absence of official statistics. Abkhazia refugee schools in other territories of Georgia were included in the sample frame.

Bahrain in 2011, Korea in 2003, Lithuania in 1999, and Dubai (UAE) in 2007 tested the same cohort of students as other countries, but later in the assessment year. South Africa (9) tested one year later.

Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish or in Russian.

An empty cell indicates a country did not participate in that year's assessment. A dash (–) indicates comparable data not available.

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Appendix C.10: Trends in Student Populations (Continued)

Country	Overall Exclusion Rates						Overall Participation Rates (After Replacement)					
	2015	2011	2007	2003	1999	1995	2015	2011	2007	2003	1999	1995
Australia	3.5%	3.2%	1.9%	1.3%		1.0%	90%	88%	93%	83%		70%
Bahrain	3.8%	1.6%	1.5%	0.0%			97%	97%	97%	98%		
Botswana (9)	0.3%	0.0%					98%	98%				
Chile	1.9%	2.8%		2.2%	2.8%		85%	95%		99%	96%	
Chinese Taipei	1.7%	1.3%	3.3%	4.8%	1.6%		98%	99%	99%	99%	99%	
Egypt	0.1%		0.5%	3.4%			91%		98%	97%		
England	2.3%	2.2%	2.3%	2.1%	5.0%	11.0%	92%	70%	75%	46%	77%	77%
Georgia	6.0%	4.5%	3.9%				98%	97%	97%			
Hong Kong SAR	1.6%	5.3%	3.8%	3.4%	0.8%	2.0%	81%	75%	75%	80%	74%	81%
Hungary	5.4%	4.4%	3.9%	8.5%	4.3%	4.0%	96%	95%	96%	94%	93%	87%
Iran, Islamic Rep. of	2.2%	2.2%	0.5%	6.5%	4.4%	0.0%	98%	99%	98%	98%	98%	98%
Ireland	1.2%					0.0%	91%					81%
Israel	22.8%	22.6%					93%	92%				
Italy	6.1%	4.7%	5.0%	3.6%	6.7%		93%	93%	96%	97%	97%	
Japan	2.3%	2.8%	3.5%	0.6%	1.3%	1.0%	93%	87%	91%	93%	89%	90%
Jordan	1.0%	0.4%	2.0%	1.3%	3.0%		96%	96%	96%	96%	99%	
Kazakhstan	3.8%	5.1%					97%	98%				
Korea, Rep. of	2.1%	1.9%	1.6%	4.9%	4.0%	4.0%	98%	99%	99%	98%	100%	95%
Kuwait	3.3%		0.3%				85%		84%			
Lebanon	1.3%	1.4%	1.4%	1.4%			88%	94%	85%	91%		
Lithuania	7.0%	4.8%	4.2%	2.6%	4.5%	7.0%	93%	92%	90%	84%	89%	83%
Malaysia	4.3%	0.1%	3.3%	4.0%	4.6%		98%	98%	98%	98%	99%	
Malta	3.5%		2.9%				96%		94%			
Morocco	0.0%	0.1%					95%	94%				
New Zealand	3.1%	3.2%		4.4%	2.4%	2.0%	81%	88%		90%	91%	94%
Oman	0.4%	1.2%	1.2%				96%	97%	99%			
Qatar	3.2%	4.5%					96%	99%				
Russian Federation	3.7%	6.0%	2.3%	5.5%	1.7%	6.0%	97%	98%	97%	96%	97%	95%
Saudi Arabia	2.1%	1.2%					97%	98%				
Singapore	7.0%	6.0%	1.8%	0.0%	0.0%	5.0%	97%	95%	95%	97%	98%	95%
Slovenia	3.8%	2.3%	1.9%	1.4%		3.0%	92%	92%	92%	91%		77%
South Africa (9)	1.5%	1.4%					96%	95%				
Sweden	5.5%	5.1%	3.6%	2.8%		1.0%	94%	92%	94%	87%		90%
Thailand	0.2%	1.5%	3.4%		3.3%		99%	99%	99%		99%	
Turkey	1.3%	1.5%					98%	97%				
United Arab Emirates	3.6%	2.8%					97%	97%				
United States	5.1%	7.2%	7.9%	4.9%	3.9%	2.0%	78%	81%	77%	73%	85%	78%
Benchmarking Participants												
Ontario, Canada	2.5%	5.6%	6.2%	6.0%	5.1%	-	87%	93%	89%	89%	93%	90%
Quebec, Canada	5.3%	4.9%	13.6%	4.8%	1.3%	-	58%	88%	77%	85%	92%	89%
Norway (8)	4.1%	1.9%	2.6%	2.3%		2.0%	87%	84%	86%	85%		93%
Abu Dhabi, UAE	4.1%	1.7%					98%	96%				
Dubai, UAE	5.2%	4.0%	5.0%				97%	95%	69%			
Florida, US	2.8%	6.9%					90%	84%				

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix D.1: Percentages of Students with Achievement Too Low for Estimation*

Country	Combined TIMSS and TIMSS Numeracy Percentage of Students with Achievement Too Low for Estimation	TIMSS Percentage of Students with Achievement Too Low for Estimation	TIMSS Numeracy Percentage of Students with Achievement Too Low for Estimation	TIMSS Average Percent Correct	TIMSS Numeracy Average Percent Correct
Australia	3 (0.3)	3 (0.3)	- -	51 (0.7)	- -
Bahrain	5 (0.4)	10 (0.7)	1 (0.2)	36 (0.4)	55 (0.4)
Belgium (Flemish)	1 (0.1)	1 (0.1)	- -	58 (0.6)	- -
Bulgaria	4 (0.6)	4 (0.6)	- -	53 (1.3)	- -
Canada	3 (0.4)	3 (0.4)	- -	49 (0.5)	- -
Chile	7 (0.6)	7 (0.6)	- -	37 (0.5)	- -
Chinese Taipei	0 (0.1)	0 (0.1)	- -	70 (0.4)	- -
Croatia	3 (0.3)	3 (0.3)	- -	47 (0.5)	- -
Cyprus	3 (0.3)	3 (0.3)	- -	53 (0.6)	- -
Czech Republic	2 (0.3)	2 (0.3)	- -	53 (0.6)	- -
Denmark	2 (0.3)	2 (0.3)	- -	56 (0.7)	- -
England	2 (0.3)	2 (0.3)	- -	58 (0.7)	- -
Finland	1 (0.2)	1 (0.2)	- -	55 (0.5)	- -
France	4 (0.4)	4 (0.4)	- -	43 (0.7)	- -
Georgia	8 (0.7)	8 (0.7)	- -	39 (0.8)	- -
Germany	2 (0.3)	2 (0.3)	- -	52 (0.5)	- -
Hong Kong SAR	0 (0.1)	0 (0.1)	- -	75 (0.7)	- -
Hungary	4 (0.5)	4 (0.5)	- -	55 (0.7)	- -
Indonesia	11 (0.7)	19 (1.2)	2 (0.4)	26 (0.6)	44 (0.7)
Iran, Islamic Rep. of	9 (0.8)	14 (1.2)	3 (0.6)	32 (0.6)	53 (0.6)
Ireland	1 (0.2)	1 (0.2)	- -	59 (0.6)	- -
Italy	3 (0.3)	3 (0.3)	- -	48 (0.6)	- -
Japan	0 (0.1)	0 (0.1)	- -	70 (0.4)	- -
Jordan	5 (0.4)	- -	5 (0.4)	- -	43 (0.6)
Kazakhstan	1 (0.2)	1 (0.2)	- -	57 (1.2)	- -
Korea, Rep. of	0 (0.1)	0 (0.1)	- -	73 (0.5)	- -
ψ Kuwait	20 (0.9)	32 (1.3)	8 (0.7)	21 (0.6)	35 (0.9)
Lithuania	1 (0.2)	1 (0.2)	- -	56 (0.7)	- -
Morocco	12 (0.5)	21 (0.8)	4 (0.3)	25 (0.6)	40 (0.7)
Netherlands	1 (0.2)	1 (0.2)	- -	53 (0.5)	- -
New Zealand	6 (0.4)	6 (0.4)	- -	45 (0.5)	- -
Northern Ireland	2 (0.3)	2 (0.3)	- -	64 (0.7)	- -
Norway (5)	1 (0.2)	1 (0.2)	- -	59 (0.7)	- -
Oman	14 (0.5)	14 (0.5)	- -	33 (0.5)	- -
Poland	2 (0.2)	2 (0.2)	- -	55 (0.6)	- -
Portugal	1 (0.2)	1 (0.2)	- -	57 (0.6)	- -
Qatar	13 (0.7)	13 (0.7)	- -	35 (0.7)	- -
Russian Federation	1 (0.2)	1 (0.2)	- -	63 (0.9)	- -
ψ Saudi Arabia	22 (1.0)	22 (1.0)	- -	25 (0.6)	- -
Serbia	4 (0.8)	4 (0.8)	- -	51 (0.8)	- -
Singapore	1 (0.1)	1 (0.1)	- -	74 (0.8)	- -
Slovak Republic	5 (0.4)	5 (0.4)	- -	46 (0.5)	- -
Slovenia	2 (0.3)	2 (0.3)	- -	51 (0.5)	- -
South Africa (5)	3 (0.4)	- -	3 (0.4)	- -	39 (0.7)
Spain	3 (0.4)	3 (0.4)	- -	47 (0.6)	- -
Sweden	2 (0.4)	2 (0.4)	- -	51 (0.7)	- -
Turkey	7 (0.5)	7 (0.5)	- -	44 (0.7)	- -
United Arab Emirates	12 (0.4)	12 (0.4)	- -	38 (0.5)	- -
United States	2 (0.2)	2 (0.2)	- -	57 (0.5)	- -

* Students were considered to have achievement too low for estimation if their performance on the assessment was no better than could be achieved by simply guessing on the multiple-choice assessment items. However, such students were assigned scale scores (plausible values) by the achievement scaling procedure, despite concerns about their reliability.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix D.1: Percentages of Students with Achievement Too Low for Estimation* (Continued)

Country	Combined TIMSS and TIMSS Numeracy Percentage of Students with Achievement Too Low for Estimation	TIMSS Percentage of Students with Achievement Too Low for Estimation	TIMSS Numeracy Percentage of Students with Achievement Too Low for Estimation	TIMSS Average Percent Correct	TIMSS Numeracy Average Percent Correct
Benchmarking Participants					
Buenos Aires, Argentina	10 (0.6)	19 (1.0)	2 (0.3)	28 (0.6)	52 (0.7)
Ontario, Canada	3 (0.4)	3 (0.4)	- -	50 (0.6)	- -
Quebec, Canada	1 (0.2)	1 (0.2)	- -	55 (1.1)	- -
Norway (4)	4 (0.5)	4 (0.5)	- -	45 (0.5)	- -
ψ Abu Dhabi, UAE	18 (0.9)	18 (0.9)	- -	32 (0.9)	- -
Dubai, UAE	5 (0.3)	5 (0.3)	- -	50 (0.4)	- -
Florida, US	2 (0.3)	2 (0.3)	- -	58 (1.2)	- -

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix D.2: Percentages of Students with Achievement Too Low for Estimation*

Country	Percentage of Students with Achievement Too Low for Estimation	Average Percent Correct
Australia	6 (0.5)	45 (0.7)
Bahrain	9 (0.3)	35 (0.3)
ψ Botswana (9)	23 (0.7)	23 (0.3)
Canada	3 (0.4)	50 (0.6)
ψ Chile	18 (0.8)	28 (0.5)
Chinese Taipei	2 (0.2)	68 (0.5)
ψ Egypt	24 (0.9)	25 (0.5)
England	4 (0.6)	48 (1.1)
Georgia	13 (0.9)	34 (0.7)
Hong Kong SAR	1 (0.2)	68 (1.1)
Hungary	6 (0.5)	48 (0.9)
ψ Iran, Islamic Rep. of	16 (0.9)	31 (0.9)
Ireland	3 (0.5)	49 (0.7)
Israel	8 (0.6)	47 (0.9)
Italy	5 (0.5)	42 (0.6)
Japan	1 (0.2)	65 (0.5)
ж Jordan	26 (0.9)	23 (0.4)
Kazakhstan	5 (0.5)	50 (1.4)
Korea, Rep. of	1 (0.1)	69 (0.6)
ψ Kuwait	24 (1.1)	24 (0.8)
Lebanon	15 (1.4)	30 (0.7)
Lithuania	5 (0.5)	46 (0.7)
Malaysia	10 (0.8)	36 (0.8)
Malta	8 (0.4)	43 (0.3)
ж Morocco	26 (0.6)	22 (0.3)
New Zealand	7 (0.6)	42 (0.8)
Norway (9)	4 (0.4)	46 (0.6)
ψ Oman	21 (0.6)	26 (0.4)
ψ Qatar	17 (0.6)	32 (0.5)
Russian Federation	3 (0.5)	53 (1.3)
ж Saudi Arabia	30 (1.1)	21 (0.6)
Singapore	1 (0.1)	74 (0.8)
Slovenia	3 (0.3)	47 (0.5)
ж South Africa (9)	30 (1.3)	21 (0.7)
Sweden	6 (0.7)	43 (0.7)
Thailand	15 (0.9)	30 (1.0)
Turkey	13 (0.8)	36 (1.0)
United Arab Emirates	12 (0.4)	37 (0.4)
United States	4 (0.3)	48 (0.8)
Benchmarking Participants		
ж Buenos Aires, Argentina	30 (1.4)	23 (0.7)
Ontario, Canada	4 (0.5)	49 (0.8)
Quebec, Canada	1 (0.6)	54 (1.0)
Norway (8)	6 (0.5)	39 (0.5)
Abu Dhabi, UAE	15 (1.0)	32 (0.9)
Dubai, UAE	5 (0.3)	47 (0.5)
Florida, US	7 (1.0)	43 (1.5)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

* Students were considered to have achievement too low for estimation if their performance on the assessment was no better than could be achieved by simply guessing on the multiple-choice assessment items. However, such students were assigned scale scores (plausible values) by the achievement scaling procedure, despite concerns about their reliability.

ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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Appendix E.1: Average Percent Correct in the Mathematics Content and Cognitive Domains

Country	Overall Mathematics	Mathematics Content Domains			Mathematics Cognitive Domains		
		Number	Geometric Shapes and Measures	Data Display	Knowing	Applying	Reasoning
Australia	51 (0.7)	47 (0.8)	53 (0.7)	63 (0.8)	56 (0.7)	50 (0.7)	46 (0.7)
Bahrain	36 (0.4)	35 (0.4)	36 (0.4)	44 (0.7)	44 (0.5)	33 (0.4)	29 (0.5)
Belgium (Flemish)	58 (0.6)	56 (0.7)	60 (0.6)	61 (0.6)	66 (0.6)	56 (0.6)	48 (0.7)
Bulgaria	53 (1.3)	53 (1.2)	52 (1.3)	56 (1.6)	60 (1.3)	51 (1.3)	44 (1.3)
Canada	49 (0.5)	45 (0.6)	51 (0.6)	62 (0.6)	55 (0.6)	47 (0.6)	45 (0.6)
Chile	37 (0.5)	34 (0.5)	38 (0.5)	47 (0.7)	42 (0.6)	35 (0.6)	33 (0.5)
Chinese Taipei	70 (0.4)	71 (0.5)	67 (0.5)	77 (0.5)	80 (0.4)	68 (0.5)	58 (0.6)
Croatia	47 (0.5)	44 (0.5)	48 (0.5)	54 (0.7)	53 (0.5)	43 (0.5)	41 (0.6)
Cyprus	53 (0.6)	52 (0.7)	52 (0.6)	57 (0.8)	58 (0.6)	52 (0.7)	45 (0.6)
Czech Republic	53 (0.6)	51 (0.7)	53 (0.7)	61 (0.7)	58 (0.6)	51 (0.7)	50 (0.7)
Denmark	56 (0.7)	53 (0.8)	59 (0.7)	62 (0.8)	62 (0.8)	54 (0.7)	51 (0.8)
England	58 (0.7)	56 (0.8)	57 (0.7)	68 (0.7)	66 (0.7)	56 (0.7)	50 (0.8)
Finland	55 (0.5)	52 (0.5)	55 (0.6)	65 (0.6)	60 (0.5)	53 (0.5)	50 (0.7)
France	43 (0.7)	40 (0.7)	47 (0.7)	49 (0.8)	50 (0.7)	41 (0.7)	38 (0.7)
Georgia	39 (0.8)	41 (0.8)	34 (0.8)	41 (0.9)	45 (0.9)	37 (0.8)	31 (0.8)
Germany	52 (0.5)	48 (0.6)	53 (0.6)	64 (0.7)	58 (0.6)	48 (0.6)	48 (0.6)
Hong Kong SAR	75 (0.7)	74 (0.8)	73 (0.7)	81 (0.7)	80 (0.6)	76 (0.7)	64 (0.9)
Hungary	55 (0.7)	54 (0.7)	55 (0.8)	58 (0.9)	62 (0.7)	52 (0.8)	48 (0.8)
Indonesia	26 (0.6)	24 (0.6)	28 (0.7)	31 (0.9)	32 (0.8)	24 (0.6)	20 (0.5)
Iran, Islamic Rep. of	32 (0.6)	31 (0.6)	34 (0.7)	34 (0.8)	39 (0.7)	31 (0.6)	25 (0.6)
Ireland	59 (0.6)	58 (0.6)	57 (0.6)	67 (0.7)	67 (0.6)	57 (0.6)	48 (0.6)
Italy	48 (0.6)	47 (0.6)	47 (0.7)	54 (0.7)	56 (0.7)	45 (0.6)	40 (0.6)
Japan	70 (0.4)	69 (0.5)	69 (0.5)	78 (0.5)	76 (0.4)	67 (0.5)	64 (0.6)
Kazakhstan	57 (1.2)	58 (1.1)	55 (1.4)	60 (1.1)	63 (1.1)	55 (1.2)	52 (1.3)
Korea, Rep. of	73 (0.5)	73 (0.5)	70 (0.4)	81 (0.5)	81 (0.5)	69 (0.5)	69 (0.5)
ψ Kuwait	21 (0.6)	21 (0.7)	21 (0.6)	24 (0.9)	27 (0.9)	19 (0.6)	16 (0.5)
Lithuania	56 (0.7)	55 (0.7)	53 (0.7)	65 (0.7)	61 (0.7)	54 (0.7)	48 (0.8)
Morocco	25 (0.6)	23 (0.6)	28 (0.7)	26 (0.8)	32 (0.7)	22 (0.6)	20 (0.6)
Netherlands	53 (0.5)	52 (0.5)	50 (0.5)	64 (0.7)	57 (0.5)	51 (0.5)	50 (0.6)
New Zealand	45 (0.5)	42 (0.5)	45 (0.6)	57 (0.6)	48 (0.5)	43 (0.6)	42 (0.6)
Northern Ireland	64 (0.7)	64 (0.8)	63 (0.7)	71 (0.7)	71 (0.8)	64 (0.7)	52 (0.8)
Norway (5)	59 (0.7)	55 (0.7)	59 (0.8)	71 (0.7)	63 (0.7)	57 (0.7)	54 (0.8)
Oman	33 (0.5)	31 (0.5)	35 (0.5)	38 (0.6)	39 (0.5)	32 (0.5)	26 (0.4)
Poland	55 (0.6)	53 (0.6)	53 (0.5)	65 (0.7)	57 (0.6)	55 (0.6)	51 (0.6)
Portugal	57 (0.6)	55 (0.6)	56 (0.7)	67 (0.6)	65 (0.6)	55 (0.7)	47 (0.6)
Qatar	35 (0.7)	34 (0.7)	33 (0.7)	42 (0.9)	42 (0.7)	32 (0.7)	28 (0.7)
Russian Federation	63 (0.9)	63 (0.9)	59 (1.0)	72 (0.9)	67 (0.8)	62 (0.9)	57 (1.0)
ψ Saudi Arabia	25 (0.6)	23 (0.6)	27 (0.7)	28 (0.6)	30 (0.7)	23 (0.6)	20 (0.6)
Serbia	51 (0.8)	51 (0.8)	48 (0.8)	59 (0.9)	56 (0.8)	50 (0.8)	45 (0.8)
Singapore	74 (0.8)	77 (0.9)	70 (0.8)	78 (0.8)	81 (0.7)	74 (0.9)	65 (1.0)
Slovak Republic	46 (0.5)	45 (0.6)	44 (0.6)	54 (0.7)	50 (0.5)	44 (0.6)	44 (0.6)
Slovenia	51 (0.5)	47 (0.5)	53 (0.6)	65 (0.6)	56 (0.5)	50 (0.6)	45 (0.5)
Spain	47 (0.6)	45 (0.6)	46 (0.8)	58 (0.8)	55 (0.6)	45 (0.6)	40 (0.7)
Sweden	51 (0.7)	48 (0.7)	51 (0.8)	63 (0.8)	53 (0.7)	49 (0.7)	51 (0.8)
Turkey	44 (0.7)	43 (0.7)	43 (0.6)	51 (0.8)	53 (0.7)	42 (0.7)	34 (0.6)
United Arab Emirates	38 (0.5)	37 (0.5)	37 (0.6)	46 (0.6)	45 (0.6)	36 (0.5)	31 (0.4)
United States	57 (0.5)	57 (0.6)	52 (0.6)	65 (0.6)	65 (0.6)	54 (0.6)	47 (0.6)
International Avg.	50 (0.1)	49 (0.1)	50 (0.1)	57 (0.1)	56 (0.1)	48 (0.1)	44 (0.1)

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix E.1: Average Percent Correct in the Mathematics Content and Cognitive Domains (Continued)

Country	Overall Mathematics	Mathematics Content Domains			Mathematics Cognitive Domains		
		Number	Geometric Shapes and Measures	Data Display	Knowing	Applying	Reasoning
Benchmarking Participants							
Buenos Aires, Argentina	28 (0.6)	29 (0.6)	26 (0.6)	30 (1.0)	35 (0.7)	25 (0.6)	23 (0.7)
Ontario, Canada	50 (0.6)	44 (0.7)	53 (0.7)	64 (0.7)	54 (0.7)	48 (0.7)	46 (0.6)
Quebec, Canada	55 (1.1)	53 (1.1)	56 (1.2)	65 (1.0)	63 (1.0)	52 (1.1)	49 (1.3)
Norway (4)	45 (0.5)	41 (0.5)	47 (0.6)	54 (0.8)	48 (0.6)	44 (0.6)	41 (0.6)
ψ Abu Dhabi, UAE	32 (0.9)	31 (0.9)	32 (1.0)	40 (1.1)	38 (1.0)	31 (1.0)	26 (0.8)
Dubai, UAE	50 (0.4)	49 (0.4)	48 (0.4)	59 (0.5)	57 (0.4)	48 (0.4)	42 (0.4)
Florida, US	58 (1.2)	60 (1.3)	53 (1.2)	65 (1.1)	67 (1.1)	56 (1.3)	48 (1.3)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix E.2: Average Percent Correct in the Mathematics Content and Cognitive Domains – TIMSS Numeracy

Country	Overall Mathematics	Mathematics Content Domains			Mathematics Cognitive Domains		
		Number	Geometric Shapes and Measures	Data Display	Knowing	Applying	Reasoning
Bahrain	54 (0.4)	64 (0.4)	54 (0.4)	52 (0.4)	63 (0.4)	49 (0.4)	34 (0.4)
Indonesia	43 (0.7)	48 (0.8)	44 (0.7)	41 (0.7)	52 (0.8)	38 (0.7)	25 (0.6)
Iran, Islamic Rep. of	51 (0.6)	58 (0.7)	50 (0.6)	51 (0.6)	61 (0.6)	47 (0.6)	32 (0.6)
Jordan	41 (0.6)	47 (0.7)	45 (0.5)	39 (0.6)	51 (0.6)	37 (0.6)	23 (0.6)
ψ Kuwait	34 (0.8)	42 (1.1)	36 (0.8)	32 (0.9)	43 (0.9)	30 (0.9)	18 (0.7)
Morocco	38 (0.7)	43 (0.9)	44 (0.7)	35 (0.7)	47 (0.7)	35 (0.7)	22 (0.6)
South Africa	38 (0.6)	47 (0.7)	39 (0.6)	36 (0.7)	47 (0.7)	33 (0.6)	21 (0.6)
International Avg.	43 (0.2)	50 (0.3)	45 (0.2)	41 (0.3)	52 (0.3)	38 (0.3)	25 (0.2)
Benchmarking Participants							
Buenos Aires, Argentina	51 (0.7)	56 (0.9)	46 (0.7)	51 (0.7)	60 (0.6)	44 (0.7)	35 (0.8)

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix E.3: Average Percent Correct in the Mathematics Content and Cognitive Domains

Country	Overall Mathematics	Mathematics Content Domains				Mathematics Cognitive Domains		
		Number	Algebra	Geometry	Data and Chance	Knowing	Applying	Reasoning
Australia	45 (0.7)	51 (0.8)	35 (0.7)	40 (0.8)	55 (0.7)	54 (0.7)	43 (0.7)	36 (0.8)
Bahrain	35 (0.3)	33 (0.4)	36 (0.4)	31 (0.4)	42 (0.4)	47 (0.4)	32 (0.3)	25 (0.5)
ψ Botswana (9)	23 (0.3)	25 (0.4)	20 (0.3)	20 (0.3)	28 (0.3)	32 (0.3)	21 (0.3)	15 (0.2)
Canada	50 (0.6)	57 (0.7)	40 (0.6)	46 (0.6)	58 (0.6)	58 (0.6)	49 (0.6)	41 (0.6)
ψ Chile	28 (0.5)	30 (0.6)	22 (0.5)	26 (0.5)	37 (0.6)	36 (0.6)	27 (0.5)	21 (0.5)
Chinese Taipei	68 (0.5)	69 (0.6)	67 (0.7)	65 (0.6)	69 (0.5)	74 (0.6)	68 (0.6)	60 (0.6)
ψ Egypt	25 (0.5)	26 (0.6)	25 (0.7)	22 (0.6)	26 (0.5)	36 (0.7)	22 (0.5)	15 (0.5)
England	48 (1.1)	54 (1.3)	37 (1.1)	43 (1.1)	60 (1.1)	56 (1.1)	47 (1.2)	39 (1.1)
Georgia	34 (0.7)	37 (0.8)	33 (0.9)	29 (0.7)	36 (0.6)	45 (0.9)	32 (0.7)	23 (0.7)
Hong Kong SAR	68 (1.1)	72 (1.1)	62 (1.2)	64 (1.1)	72 (1.0)	76 (1.0)	67 (1.1)	57 (1.3)
Hungary	48 (0.9)	52 (1.0)	41 (1.0)	45 (1.0)	55 (0.8)	56 (0.9)	47 (1.0)	38 (1.0)
ψ Iran, Islamic Rep. of	31 (0.9)	32 (1.0)	28 (0.9)	30 (0.9)	36 (0.9)	40 (1.0)	29 (0.9)	23 (0.9)
Ireland	49 (0.7)	60 (0.8)	39 (0.7)	40 (0.7)	58 (0.7)	61 (0.7)	48 (0.7)	38 (0.7)
Israel	47 (0.9)	52 (1.0)	45 (1.0)	39 (0.9)	52 (0.9)	57 (1.0)	46 (1.0)	37 (0.9)
Italy	42 (0.6)	45 (0.7)	33 (0.7)	41 (0.7)	49 (0.6)	50 (0.6)	41 (0.7)	33 (0.7)
Japan	65 (0.5)	66 (0.5)	62 (0.7)	64 (0.6)	71 (0.5)	71 (0.5)	65 (0.5)	57 (0.6)
ж Jordan	23 (0.4)	22 (0.5)	24 (0.6)	21 (0.4)	26 (0.4)	32 (0.6)	21 (0.4)	15 (0.3)
Kazakhstan	50 (1.4)	51 (1.4)	53 (1.5)	47 (1.5)	48 (1.2)	61 (1.3)	49 (1.5)	39 (1.4)
Korea, Rep. of	69 (0.6)	72 (0.6)	67 (0.7)	67 (0.7)	72 (0.5)	76 (0.5)	69 (0.6)	61 (0.7)
ψ Kuwait	24 (0.8)	25 (1.0)	21 (0.8)	21 (0.7)	30 (0.9)	33 (1.0)	22 (0.9)	14 (0.7)
Lebanon	30 (0.7)	32 (0.8)	31 (0.8)	28 (0.8)	29 (0.7)	44 (0.9)	27 (0.7)	17 (0.6)
Lithuania	46 (0.7)	50 (0.7)	38 (0.8)	43 (0.7)	55 (0.6)	54 (0.7)	47 (0.7)	34 (0.7)
Malaysia	36 (0.8)	41 (0.9)	31 (0.7)	32 (0.7)	41 (0.8)	48 (0.9)	34 (0.8)	25 (0.6)
Malta	43 (0.3)	48 (0.4)	38 (0.4)	37 (0.4)	49 (0.4)	54 (0.3)	41 (0.4)	31 (0.4)
ж Morocco	22 (0.3)	22 (0.3)	19 (0.3)	23 (0.3)	25 (0.3)	30 (0.4)	20 (0.3)	14 (0.2)
New Zealand	42 (0.8)	47 (0.9)	33 (0.8)	37 (0.7)	53 (0.8)	50 (0.8)	41 (0.8)	34 (0.8)
Norway (9)	46 (0.6)	55 (0.7)	31 (0.5)	39 (0.6)	61 (0.7)	53 (0.6)	46 (0.6)	36 (0.6)
ψ Oman	26 (0.4)	25 (0.4)	26 (0.4)	25 (0.4)	30 (0.4)	35 (0.5)	24 (0.4)	18 (0.3)
ψ Qatar	32 (0.5)	34 (0.7)	30 (0.6)	28 (0.5)	37 (0.5)	42 (0.6)	30 (0.6)	22 (0.5)
Russian Federation	53 (1.3)	56 (1.3)	53 (1.4)	49 (1.4)	52 (1.1)	63 (1.3)	52 (1.3)	40 (1.3)
ж Saudi Arabia	21 (0.6)	19 (0.6)	20 (0.6)	18 (0.5)	28 (0.6)	28 (0.7)	19 (0.5)	14 (0.5)
Singapore	74 (0.8)	80 (0.8)	70 (0.9)	68 (0.8)	75 (0.7)	82 (0.7)	73 (0.8)	64 (1.0)
Slovenia	47 (0.5)	53 (0.6)	36 (0.5)	45 (0.6)	56 (0.6)	58 (0.6)	45 (0.5)	37 (0.6)
ж South Africa (9)	21 (0.7)	21 (0.8)	20 (0.7)	19 (0.5)	26 (0.7)	30 (0.9)	19 (0.6)	15 (0.5)
Sweden	43 (0.7)	50 (0.8)	34 (0.8)	35 (0.6)	53 (0.8)	49 (0.7)	43 (0.7)	35 (0.7)
Thailand	30 (1.0)	32 (1.1)	25 (1.0)	27 (0.9)	36 (0.9)	37 (1.1)	28 (1.0)	22 (0.9)
Turkey	36 (1.0)	36 (1.1)	32 (1.0)	34 (1.0)	45 (1.0)	43 (1.0)	35 (1.0)	30 (1.0)
United Arab Emirates	37 (0.4)	39 (0.5)	36 (0.4)	31 (0.4)	42 (0.5)	49 (0.5)	34 (0.4)	27 (0.4)
United States	48 (0.8)	53 (0.9)	45 (0.8)	40 (0.8)	56 (0.8)	60 (0.8)	46 (0.8)	37 (0.8)
International Avg.	41 (0.1)	44 (0.1)	37 (0.1)	37 (0.1)	47 (0.1)	50 (0.1)	40 (0.1)	32 (0.1)
Benchmarking Participants								
ж Buenos Aires, Argentina	23 (0.7)	28 (0.8)	17 (0.6)	18 (0.6)	28 (0.8)	31 (0.8)	21 (0.7)	15 (0.5)
Ontario, Canada	49 (0.8)	55 (0.9)	38 (0.9)	45 (0.7)	58 (0.8)	56 (0.8)	47 (0.7)	41 (0.9)
Quebec, Canada	54 (1.0)	63 (1.2)	45 (0.9)	49 (1.1)	60 (1.2)	63 (1.0)	54 (1.1)	42 (1.1)
Norway (8)	39 (0.5)	48 (0.6)	23 (0.5)	34 (0.5)	55 (0.7)	46 (0.5)	39 (0.5)	30 (0.5)
Abu Dhabi, UAE	32 (0.9)	34 (1.0)	31 (0.9)	27 (0.9)	37 (1.0)	44 (0.9)	29 (1.0)	23 (0.9)
Dubai, UAE	47 (0.5)	50 (0.6)	46 (0.5)	40 (0.6)	52 (0.5)	59 (0.5)	44 (0.6)	37 (0.6)
Florida, US	43 (1.5)	47 (1.8)	40 (1.6)	34 (1.3)	48 (1.6)	54 (1.7)	40 (1.6)	32 (1.3)

ж Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 25%.
ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix F: The Test-Curriculum Matching Analysis

TIMSS went to great lengths to ensure that comparisons of student achievement across countries would be as fair and equitable as possible. The *TIMSS 2015 Assessment Frameworks* were designed to specify the important aspects of mathematics that participating countries agreed should be the focus of an international assessment of mathematics achievement, and the assessment items were developed through a collaborative process with national representatives to faithfully represent the specifications in the frameworks and field tested extensively in participating countries. Finalizing the TIMSS 2015 assessments involved a series of reviews by representatives of the participating countries, experts in mathematics, and testing specialists. At the end of this process, the National Research Coordinators (NRCs) from each country formally approved the TIMSS 2015 assessments, thus accepting them as being sufficiently fair to compare their students' mathematics achievement with that of students from other countries.

Although the assessments were developed to represent an agreed-upon framework and were intended to have as much in common across countries as possible, it was unavoidable that the match between the TIMSS 2015 assessment (or test) and the mathematics curriculum would not be the same in all countries. To restrict test items to just those topics included in the curricula of all participating countries and covered in the same sequence would severely limit test coverage and restrict the research questions that the study is designed to address. The tests, therefore, inevitably have some items measuring topics unfamiliar to some students in some countries.

The Test-Curriculum Matching Analysis (TCMA) was conducted to investigate the extent to which the TIMSS 2015 mathematics assessment matched each country's curriculum. The TCMA also investigates the impact on a country's performance of including only achievement items that were judged to be relevant to its own curriculum.[1]

To gather data about the extent to which the TIMSS 2015 tests matched the curricula of the TIMSS countries and benchmarking participants, NRCs were asked to examine each achievement item and indicate whether the item was in their country's intended curriculum at the grade tested (fourth or eighth grade). The NRCs were asked to choose persons very familiar with the curriculum at these grades to make this determination. In some countries, the curriculum was prescribed for a range of grades and was not explicit about what was to be covered by the end of the fourth or eighth grades. For example, in Poland the curriculum specifies the curricular goals to be achieved by the end of the sixth and ninth grades, but does not provide a grade-by-grade specification. In such

1 Because there also may be curriculum areas covered in some countries that are not covered by the TIMSS 2015 tests, the TCMA does not provide complete information about how well the tests cover the curricula of the countries.

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situations, coordinators were asked to make the best judgment possible.[2] Because an item might be in the curriculum for some but not all students in a country, NRCs were asked to consider an item included if it was in the intended curriculum for more than 50 percent of the students. All TIMSS 2015 participants took part in the TCMA analysis except Norway (4) and Buenos Aires at the fourth grade and Egypt, Norway (8), and Buenos Aires at the eighth grade. TCMA was not administered for TIMSS Numeracy and therefore Jordan and South Africa (5), who participated in TIMSS Numeracy but did not participate in TIMSS at the fourth grade, are not included in the fourth grade exhibit.

Exhibits F.1 through F.4 present the TCMA results for the TIMSS 2015 mathematics test at the fourth and eighth grades. Exhibits F.1 and F.2 show the average percent correct on the mathematics items judged appropriate by each country at the fourth and eighth grades, respectively. Exhibits F.3 and F.4 show the standard errors corresponding to the percentages presented in Exhibits F.1 and F.2.

In Exhibit F.1, the bottom row of the exhibit shows the number of items, in terms of score points, identified as appropriate in each country. At the fourth grade, the maximum number of score points in the assessment was 178 points.[3] Generally, the proportion of items judged appropriate was fairly high. Reading along the bottom row, it can be seen that 4 of the 47 countries that took part in the TCMA analysis judged 100 percent of the items to be included in their curricula as did 1 of the 5 benchmarking participants. A further 34 countries and 2 of the other 4 benchmarking participants judged 75 percent or more (134 score points) to be appropriate. All of the participants concurred that more than half of the mathematics items were included in their curricula.

At the eighth grade, the percentage of items judged appropriate was similar; 4 of the 38 countries and 1 of the 5 benchmarking participants judged 100 percent of the items to be appropriate (all 221 score points), and an additional 33 countries and the remainder of the benchmarking participants judged 75 percent or more (166 score points) to be appropriate.

Because most countries indicated that at least some items were not included in their intended curriculum at the grade tested, the data were analyzed to determine whether the inclusion of these items had any effect on the international performance comparisons.[4]

The first column of data in Exhibits F.1 and F.2 show the average percent correct on all test items for each participant, together with its standard error. Subsequent columns show the performance of each participant on those items judged appropriate by the participant listed at the head of the column. Participants are presented in order of their performance based on average percent correct on all items, from highest to lowest. To interpret these exhibits, choosing a country and reading across its row provides the average percent correct for the students in that country on the items selected by each of the countries listed along the top of the exhibit. For example, at the fourth grade, Hong Kong, where the average percent correct was 75 percent on its own set of items,

2 Exhibits 5 and 6 of the TIMSS 2015 Encyclopedia provide information on the grade-to-grade structure of the curriculum for each TIMSS 2015 participant.

3 The TIMSS 2015 fourth grade mathematics assessment contained 169 items, yielding 182 score points. However, following item review, response categories for four of the items were combined, resulting in data for 178 score points. Similarly, following item review, the 212 items and 229 score points in the eighth grade assessment were reduced to 209 items and 221 score points.

4 It should be noted that the mathematics achievement presented in Exhibits F.1 and F.2 is based on average percent correct (the percentage of students in a country answering each item correctly, averaged across all items), which is different from the average scale scores that are presented in main tables of the report.

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Exhibit F.1: Average Percent Correct for the Test-Curriculum Matching Analysis, Fourth Grade

Based on a subset of items specifically identified by each country as addressing its curriculum

Read across the row to compare that country's performance based on the test items included by each of the countries across the top. Read down the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the diagonal to compare performance for each different country based on its own decisions about the test items to include.

Country	Average Percent Correct on All Items	Hong Kong SAR	Singapore	Korea, Rep. of	Chinese Taipei	Japan	Northern Ireland	Russian Federation	Ireland	Norway (5)	England	Belgium (Flemish)	Kazakhstan	Portugal	United States	Denmark	Lithuania	Finland	Hungary	Poland	Czech Republic	Netherlands	Bulgaria	Cyprus	Germany	Slovenia	Australia	Serbia	Sweden	Canada	Italy
Hong Kong SAR	75 (0.7)	75	75	75	74	76	75	75	75	75	75	75	74	75	75	77	75	75	75	75	75	75	76	75	75	75	75	75	75	75	75
Singapore	74 (0.8)	74	76	75	75	75	74	74	75	74	75	75	73	74	75	76	73	75	74	75	74	74	74	74	74	74	74	74	74	74	75
Korea, Rep. of	73 (0.5)	74	74	76	73	76	73	74	74	73	74	75	74	73	74	76	73	75	73	75	73	71	75	73	75	75	74	75	75	73	74
Chinese Taipei	70 (0.4)	72	72	73	72	74	71	71	71	70	71	72	70	70	71	73	70	71	70	72	71	69	71	71	71	70	71	72	71	70	71
Japan	70 (0.4)	70	70	72	70	73	70	70	71	70	70	72	70	70	70	73	70	71	70	71	71	69	71	70	71	71	70	71	72	70	71
Northern Ireland	64 (0.7)	64	64	64	63	65	65	65	65	64	65	64	63	64	65	67	64	64	65	64	65	66	65	65	65	65	64	64	65	64	65
Russian Federation	63 (0.9)	62	61	63	61	64	63	67	63	63	62	63	66	63	63	66	64	63	64	63	65	64	68	64	65	65	63	64	64	63	64
Ireland	59 (0.6)	59	59	59	58	60	59	59	60	59	59	59	57	59	59	62	59	59	59	59	59	59	59	60	60	60	59	58	60	59	59
Norway (5)	59 (0.7)	59	58	59	58	59	59	59	60	59	59	60	58	59	59	63	59	60	60	59	60	60	60	60	60	60	59	59	62	59	60
England	58 (0.7)	58	58	57	57	58	58	59	59	58	59	58	57	58	59	62	58	58	59	58	59	60	60	59	60	60	58	58	60	58	59
Belgium (Flemish)	58 (0.6)	58	58	58	57	59	58	57	59	58	58	59	57	58	58	61	57	59	58	59	58	57	58	58	59	58	58	58	59	58	58
Kazakhstan	57 (1.2)	57	57	58	57	58	57	61	57	57	57	58	60	57	58	60	58	58	58	58	59	58	61	58	60	59	57	59	58	57	58
Portugal	57 (0.6)	57	57	57	56	58	57	57	58	57	57	57	56	57	57	60	57	57	57	57	57	57	57	57	58	58	57	57	58	57	58
United States	57 (0.5)	57	57	57	56	57	57	57	57	56	57	57	55	57	57	60	56	57	57	56	57	57	57	57	57	58	57	57	57	57	57
Denmark	56 (0.7)	56	56	56	55	56	56	57	57	56	56	57	56	56	57	61	56	57	57	56	57	57	58	56	58	57	56	56	59	56	57
Lithuania	56 (0.7)	54	53	55	54	57	56	58	55	55	56	56	56	56	56	59	57	56	56	56	57	57	59	56	58	57	56	56	57	56	56
Finland	55 (0.5)	54	54	55	54	55	55	55	55	55	55	57	55	55	55	59	55	56	55	56	56	56	56	55	56	56	55	56	58	55	55
Hungary	55 (0.7)	55	54	54	53	55	55	58	55	55	55	55	57	55	55	58	55	55	56	54	57	56	58	56	58	57	54	56	57	55	55
Poland	55 (0.6)	54	54	55	54	55	55	56	55	54	54	56	55	55	55	58	55	56	55	56	56	55	57	55	56	56	55	56	57	55	55
Czech Republic	53 (0.6)	54	52	53	52	54	53	55	54	53	53	54	55	53	54	57	53	54	55	53	56	55	56	54	57	56	52	55	56	53	54
Netherlands	53 (0.5)	52	52	53	52	54	53	55	53	53	53	55	55	53	53	58	55	54	54	54	55	56	56	54	55	54	54	54	56	53	54
Bulgaria	53 (1.3)	54	53	54	52	55	53	59	53	53	53	53	57	53	54	56	54	53	54	54	54	53	59	54	57	55	53	55	54	53	54
Cyprus	53 (0.6)	53	52	52	51	53	53	54	53	53	53	53	53	53	53	56	53	53	54	53	54	54	54	54	54	55	53	53	55	53	53
Germany	52 (0.5)	51	51	51	50	53	52	55	53	52	52	52	53	52	52	56	52	52	53	52	53	53	56	53	56	54	52	52	54	52	52
Slovenia	51 (0.5)	51	50	50	49	51	52	53	52	51	51	51	52	51	52	55	51	52	53	51	54	53	54	52	54	54	51	52	54	51	52
Australia	51 (0.7)	51	50	50	50	51	51	51	52	51	51	51	50	51	51	55	52	51	52	51	52	53	52	52	53	53	52	51	54	51	52
Serbia	51 (0.8)	51	51	52	51	53	52	55	51	51	51	52	54	51	51	55	52	52	53	52	53	53	55	52	54	53	52	54	53	51	52
Sweden	51 (0.7)	50	49	51	49	51	51	54	51	51	51	51	52	51	51	55	52	52	52	51	53	53	55	52	54	53	52	52	55	51	52
Canada	49 (0.5)	49	48	49	48	50	50	50	50	49	49	49	49	49	50	53	50	50	50	49	51	51	51	50	51	51	50	50	52	49	50
Italy	48 (0.6)	48	48	49	47	49	48	49	49	48	48	48	48	48	48	51	48	48	48	49	48	47	50	48	50	49	48	49	49	48	49
Spain	47 (0.6)	48	47	48	47	49	48	48	48	47	47	48	47	47	48	51	48	48	48	48	48	47	49	48	50	49	48	48	49	47	48
Croatia	47 (0.5)	47	47	48	46	49	47	52	47	46	46	47	51	47	47	50	47	47	48	48	48	46	52	47	51	49	47	49	48	47	48
Slovak Republic	46 (0.5)	46	45	46	44	46	46	50	46	46	46	47	48	46	46	51	46	47	47	46	48	48	51	47	49	48	47	47	48	46	47
New Zealand	45 (0.5)	44	43	43	43	44	45	45	45	45	45	45	44	45	45	49	45	45	45	45	46	47	45	45	46	46	45	45	47	45	45
Turkey	44 (0.7)	45	45	45	44	46	45	46	45	44	44	44	44	44	45	47	45	45	45	45	45	44	46	45	46	46	44	45	45	44	45
France	44 (0.7)	44	43	43	42	44	44	45	44	43	44	44	44	44	44	47	43	44	44	44	45	43	45	44	46	45	43	45	46	44	44
Georgia	39 (0.8)	38	38	40	38	40	39	44	39	39	39	40	42	39	39	42	40	39	40	39	41	40	43	40	42	41	39	40	40	39	40
United Arab Emirates	38 (0.5)	38	38	38	37	38	38	38	38	38	38	38	37	38	38	41	38	38	38	38	39	38	38	38	39	39	38	38	39	38	38
Chile	37 (0.5)	36	36	36	36	38	37	37	38	37	37	36	36	37	37	41	38	37	38	37	39	38	38	38	39	39	37	38	40	37	37
Bahrain	36 (0.4)	36	36	36	35	36	37	37	37	36	36	36	35	36	37	39	37	36	37	36	37	37	37	37	38	38	36	36	38	36	37
Qatar	35 (0.7)	35	35	35	34	35	35	35	35	35	35	35	34	35	35	38	35	35	35	35	35	35	35	35	35	36	36	35	35	35	35
Oman	33 (0.5)	33	33	33	33	33	33	33	33	33	33	32	32	33	34	35	33	33	34	33	34	33	33	33	34	34	33	33	34	33	34
Iran, Islamic Rep. of	32 (0.6)	33	33	33	32	33	33	33	33	32	32	32	32	32	32	35	33	33	33	33	33	32	32	32	33	33	32	33	33	32	33
Indonesia	26 (0.6)	25	25	25	25	26	26	27	26	26	26	25	26	26	26	28	26	26	26	26	26	26	27	26	27	27	26	26	26	26	26
Morocco	25 (0.6)	25	25	24	24	25	25	26	25	25	26	24	25	25	25	28	25	25	25	25	26	25	26	25	26	26	25	25	26	25	25
Saudi Arabia	25 (0.6)	25	25	25	25	26	25	26	25	25	25	25	25	25	25	27	25	25	25	25	25	25	25	25	26	26	25	25	26	25	25
Kuwait	21 (0.6)	21	21	21	21	21	21	21	21	21	21	21	21	21	21	23	21	21	21	21	21	21	21	21	22	22	21	21	22	21	21
International Avg.	50 (0.1)	50	50	50	49	51	50	52	51	50	50	50	50	50	51	53	50	51	51	51	51	51	52	51	52	52	50	51	52	50	51
Benchmarking Participants																															
Florida, US	58 (1.2)	59	59	59	58	59	58	59	59	58	59	58	57	58	59	61	58	59	59	58	59	58	59	59	59	60	58	58	59	58	59
Quebec, Canada	55 (1.1)	56	55	56	55	57	56	56	56	55	56	56	55	55	56	59	55	56	56	56	56	56	56	56	57	57	56	56	58	55	56
Dubai, UAE	50 (0.4)	50	50	50	49	50	50	51	51	50	50	50	49	50	51	53	50	50	51	50	51	51	51	51	51	52	50	50	51	50	51
Ontario, Canada	50 (0.6)	50	48	49	48	50	50	51	51	50	50	49	49	50	50	54	50	51	51	49	51	51	51	51	52	52	50	50	53	50	51
Abu Dhabi, UAE	32 (0.9)	32	32	32	32	32	33	33	33	32	32	32	31	32	33	35	32	33	33	32	33	33	33	33	34	34	32	32	33	32	33
Number of Items (Score Points) Identified*	178	140	138	137	149	132	169	118	156	176	158	140	123	178	170	146	158	166	165	153	157	142	130	165	145	154	144	144	138	178	166

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

* Of the 169 items in the Mathematics test, some extended-response items were scored on a two-point scale, resulting in 182 score points. Following item review, the point values of four items were reduced, resulting in 169 items and 178 score points.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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Exhibit F.1: Average Percent Correct for the Test-Curriculum Matching Analysis, Fourth Grade (Continued)

Based on a subset of items specifically identified by each country as addressing its curriculum

Read across the row to compare that country's performance based on the test items included by each of the countries across the top. Read down the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the diagonal to compare performance for each different country based on its own decisions about the test items to include.

Country	Average Percent Correct on All Items	Spain	Croatia	Slovak Republic	New Zealand	Turkey	France	Georgia	United Arab Emirates	Chile	Bahrain	Qatar	Oman	Iran, Islamic Rep. of	Indonesia	Morocco	Saudi Arabia	Kuwait	Benchmarking Participants: Florida, US	Quebec, Canada	Dubai, UAE	Ontario, Canada	Abu Dhabi, UAE
Hong Kong SAR	75 (0.7)	76	74	74	76	75	75	74	75	75	75	75	76	75	74	75	75	75	75	75	75	74	76
Singapore	74 (0.8)	74	73	73	74	75	74	73	74	74	74	74	76	74	74	74	74	75	75	75	74	74	73
Korea, Rep. of	73 (0.5)	74	73	74	74	74	74	73	73	73	74	73	73	73	72	74	73	74	74	75	73	72	72
Chinese Taipei	70 (0.4)	71	70	71	70	71	71	71	70	70	71	71	73	70	70	71	70	72	71	71	70	70	69
Japan	70 (0.4)	71	69	70	71	71	71	71	70	69	70	70	70	70	69	71	70	70	70	71	70	70	70
Northern Ireland	64 (0.7)	65	62	65	65	65	65	64	64	64	65	64	66	64	64	65	64	65	65	66	64	65	65
Russian Federation	63 (0.9)	63	65	66	64	64	64	65	63	63	63	63	63	63	61	64	63	63	63	64	63	62	65
Ireland	59 (0.6)	59	56	58	60	59	59	58	59	58	59	59	61	59	58	59	59	60	59	61	59	60	59
Norway (5)	59 (0.7)	60	57	60	61	60	60	59	59	59	59	59	60	59	57	59	59	59	59	61	59	60	60
England	58 (0.7)	59	57	60	60	59	59	58	58	58	59	58	60	58	57	59	58	59	59	60	58	59	59
Belgium (Flemish)	58 (0.6)	59	57	57	59	59	59	57	58	58	58	58	60	58	57	59	58	59	58	59	58	57	57
Kazakhstan	57 (1.2)	58	61	59	58	58	58	58	57	58	58	58	58	58	57	59	57	58	58	59	57	57	59
Portugal	57 (0.6)	58	55	56	59	57	57	57	57	57	57	57	59	57	56	57	57	58	57	59	57	57	57
United States	57 (0.5)	57	55	56	58	57	57	56	57	56	57	56	58	57	56	57	57	57	57	58	57	57	56
Denmark	56 (0.7)	57	56	57	58	57	57	56	56	56	56	56	57	56	55	57	56	56	57	58	56	56	57
Lithuania	56 (0.7)	56	55	57	57	56	56	56	56	55	56	55	56	56	54	57	56	56	56	57	56	55	57
Finland	55 (0.5)	55	53	56	57	56	55	55	55	54	55	54	56	55	53	55	55	55	55	57	55	55	56
Hungary	55 (0.7)	55	57	58	56	56	56	56	55	54	55	55	56	55	54	58	55	55	55	57	55	54	57
Poland	55 (0.6)	55	54	56	57	56	55	56	55	54	55	54	55	55	53	54	55	55	55	56	55	55	55
Czech Republic	53 (0.6)	54	55	57	55	54	55	55	53	53	54	53	55	54	52	55	53	54	54	55	53	54	55
Netherlands	53 (0.5)	54	53	58	54	54	54	54	53	53	54	53	54	54	51	54	53	53	53	55	53	54	56
Bulgaria	53 (1.3)	53	58	57	54	54	54	55	53	53	54	53	54	53	53	57	53	54	54	55	53	51	56
Cyprus	53 (0.6)	53	53	52	55	54	54	54	53	52	53	53	54	53	52	54	53	53	53	55	53	53	55
Germany	52 (0.5)	53	53	56	54	53	53	53	52	52	52	52	53	52	50	55	52	52	52	54	52	53	54
Slovenia	51 (0.5)	52	51	53	54	52	52	52	51	51	52	51	52	52	49	52	51	52	52	54	51	52	53
Australia	51 (0.7)	52	49	51	54	52	52	51	51	51	52	51	52	51	49	52	51	52	51	53	51	53	53
Serbia	51 (0.8)	52	54	54	53	52	52	53	51	51	52	51	52	52	50	53	51	52	51	53	51	51	53
Sweden	51 (0.7)	51	51	54	53	52	52	52	51	51	51	50	51	51	48	52	51	51	51	53	51	52	54
Canada	49 (0.5)	50	48	50	52	50	50	50	49	49	50	49	50	50	47	50	49	50	50	51	49	51	51
Italy	48 (0.6)	49	48	48	50	49	48	48	48	48	48	48	49	48	47	49	48	48	48	49	48	47	48
Spain	47 (0.6)	48	47	48	50	48	48	48	47	47	48	48	49	48	46	49	47	48	48	49	47	47	47
Croatia	47 (0.5)	47	52	50	48	48	48	49	47	46	47	47	48	47	45	51	47	47	47	49	47	44	48
Slovak Republic	46 (0.5)	46	48	52	47	47	47	48	46	45	46	46	47	46	45	48	46	46	46	49	46	47	48
New Zealand	45 (0.5)	45	42	45	47	45	45	45	45	44	45	44	45	45	43	44	45	45	45	46	45	46	46
Turkey	44 (0.7)	45	44	44	46	45	45	45	44	44	45	45	46	45	44	45	44	45	45	46	44	44	45
France	44 (0.7)	44	44	43	46	44	44	44	44	44	44	44	45	44	43	45	44	44	44	46	44	43	45
Georgia	39 (0.8)	39	42	43	39	40	40	41	39	38	39	39	40	39	39	42	39	39	39	41	39	38	41
United Arab Emirates	38 (0.5)	38	36	38	39	39	39	38	38	38	38	38	39	38	37	38	38	38	38	39	38	38	38
Chile	37 (0.5)	38	35	37	40	38	38	37	37	37	37	37	38	38	36	37	37	37	37	39	37	38	39
Bahrain	36 (0.4)	37	35	36	38	37	37	36	36	36	37	36	38	37	35	37	36	37	37	38	36	37	37
Qatar	35 (0.7)	35	33	35	36	35	35	35	35	34	35	35	36	35	34	35	35	35	35	36	35	34	35
Oman	33 (0.5)	34	32	31	34	34	34	33	33	33	34	33	35	34	33	34	33	34	34	34	33	33	34
Iran, Islamic Rep. of	32 (0.6)	33	31	30	34	33	33	32	32	32	33	33	34	33	32	32	32	33	32	33	32	32	32
Indonesia	26 (0.6)	27	26	25	27	27	27	25	26	26	26	26	27	26	26	27	26	26	26	27	26	25	26
Morocco	25 (0.6)	26	25	24	26	26	26	25	25	25	26	26	26	25	26	27	25	26	25	26	25	25	25
Saudi Arabia	25 (0.6)	26	25	24	26	26	26	25	25	25	25	25	26	25	25	25	25	25	25	26	25	25	26
Kuwait	21 (0.6)	21	20	20	22	22	21	21	21	21	21	21	22	21	21	21	21	21	21	22	21	21	21
International Avg.	50 (0.1)	51	50	51	52	51	51	51	50	50	50	50	51	50	49	51	50	51	51	52	50	50	51
Benchmarking Participants																							
Florida, US	58 (1.2)	58	56	58	60	59	58	58	58	58	59	58	60	58	58	58	58	59	59	60	58	58	58
Quebec, Canada	55 (1.1)	57	55	55	58	56	56	56	55	55	56	56	57	56	54	56	55	56	56	58	55	56	56
Dubai, UAE	50 (0.4)	51	49	50	52	51	51	50	50	50	51	50	51	50	49	51	50	51	51	52	50	50	51
Ontario, Canada	50 (0.6)	51	48	51	53	51	51	50	50	50	50	50	51	51	48	51	50	50	50	52	50	51	52
Abu Dhabi, UAE	32 (0.9)	33	31	32	33	33	33	32	32	32	33	33	33	32	32	33	32	33	33	33	32	32	33
Number of Items (Score Points) Identified*	178	160	111	102	132	172	166	146	178	169	175	170	130	168	142	129	178	161	170	149	178	125	127

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit F.2: Average Percent Correct for the Test-Curriculum Matching Analysis, Eighth Grade

Based on a subset of items specifically identified by each country as addressing its curriculum

Read across the row to compare that country's performance based on the test items included by each of the countries across the top. Read down the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the diagonal to compare performance for each different country based on its own decisions about the test items to include.

Country	Average Percent Correct on All Items	Singapore	Korea, Rep. of	Chinese Taipei	Hong Kong SAR	Japan	Russian Federation	Kazakhstan	Canada	Ireland	United States	England	Hungary	Israel	Slovenia	Lithuania	Norway (9)	Australia	Malta	Sweden	New Zealand	Italy	United Arab Emirates	Malaysia	Turkey	Bahrain	Georgia	Qatar	Iran, Islamic Rep. of	Lebanon	Thailand
Singapore	74 (0.8)	74	74	74	75	74	75	74	75	74	74	74	74	74	74	75	74	74	74	75	76	75	74	75	74	74	74	74	75	77	74
Korea, Rep. of	69 (0.6)	70	70	70	70	70	70	69	70	70	69	69	69	69	69	70	70	70	70	71	72	70	69	71	70	69	69	70	70	72	70
Chinese Taipei	68 (0.5)	68	68	68	69	68	69	68	69	68	68	68	68	68	68	69	68	68	68	69	69	68	68	69	68	68	68	68	69	70	69
Hong Kong SAR	68 (1.1)	68	68	68	69	68	69	68	70	68	68	68	68	68	68	69	68	68	68	70	70	69	68	69	68	68	68	68	69	71	69
Japan	65 (0.5)	65	66	65	65	67	66	65	66	65	65	65	65	65	65	65	65	66	66	66	68	65	65	66	65	65	65	66	66	66	66
Russian Federation	53 (1.3)	53	53	53	54	53	55	53	53	53	53	53	53	53	53	54	53	53	53	53	54	53	53	54	53	53	53	53	54	56	54
Kazakhstan	50 (1.4)	51	51	50	51	50	52	50	50	50	50	50	50	50	51	51	50	51	50	50	51	50	50	51	50	50	50	51	51	53	51
Canada	50 (0.6)	50	51	50	51	52	51	50	54	51	50	50	50	50	50	51	51	51	51	53	55	51	50	52	50	50	50	51	52	52	51
Ireland	49 (0.7)	50	50	50	50	51	51	50	53	50	49	49	50	50	50	50	50	51	50	52	54	51	49	51	50	50	50	51	51	53	51
United States	48 (0.8)	49	49	48	48	50	49	49	50	49	49	48	48	49	48	49	49	49	49	50	51	49	48	49	49	49	49	49	49	50	49
England	48 (1.1)	48	48	48	48	49	49	48	51	49	48	48	48	48	48	49	49	49	49	50	52	49	48	49	48	48	48	49	49	50	49
Hungary	48 (0.9)	48	49	48	48	49	49	48	50	49	48	48	48	48	48	49	49	49	49	50	52	49	48	50	48	48	48	49	49	51	49
Israel	47 (0.9)	48	48	47	48	48	49	47	48	48	47	47	47	48	48	48	48	48	48	48	49	48	47	48	48	48	48	48	48	49	48
Slovenia	47 (0.5)	47	48	47	48	49	48	47	50	48	47	47	47	47	48	48	48	48	48	50	51	48	47	49	47	47	47	48	48	51	48
Lithuania	46 (0.7)	46	46	46	47	47	47	46	49	47	46	46	46	46	46	48	47	47	47	49	50	47	46	48	46	46	46	47	47	49	47
Norway (9)	46 (0.6)	46	46	46	46	47	47	46	49	47	46	46	46	46	46	47	47	47	47	49	50	47	46	47	46	46	46	47	47	48	47
Australia	45 (0.7)	45	45	45	45	46	46	45	48	46	45	45	45	45	45	46	46	46	46	47	49	46	45	46	45	45	45	46	46	46	46
Malta	43 (0.3)	43	43	43	43	44	44	43	45	43	43	43	43	43	43	44	43	44	44	45	46	44	43	44	43	43	43	44	44	45	44
Sweden	43 (0.7)	43	43	43	43	44	44	43	45	43	43	43	43	43	43	44	44	44	43	46	47	44	43	44	43	43	43	44	44	45	44
New Zealand	42 (0.8)	42	43	42	42	44	43	42	45	43	42	42	42	42	42	43	43	43	43	45	46	43	42	43	42	42	42	43	43	44	43
Italy	42 (0.6)	42	42	42	42	43	43	42	44	42	42	42	42	42	42	43	42	43	42	43	45	43	42	43	42	42	42	43	43	44	43
United Arab Emirates	37 (0.4)	37	37	37	37	38	38	37	39	37	37	37	37	37	37	37	37	38	37	38	39	38	37	37	37	37	37	38	38	39	37
Malaysia	36 (0.8)	37	37	37	37	37	38	36	39	37	36	36	36	37	37	38	37	37	37	38	39	37	36	38	37	37	37	37	37	39	37
Turkey	36 (1.0)	36	36	36	36	36	37	36	38	37	36	36	36	36	36	36	37	37	36	37	38	37	36	37	36	36	36	37	37	37	37
Bahrain	35 (0.3)	35	35	35	34	36	36	35	36	36	35	35	35	35	35	35	35	36	35	35	37	35	35	35	35	35	35	36	35	36	35
Georgia	34 (0.7)	34	34	34	34	35	35	34	35	34	34	34	34	34	34	35	34	35	34	35	36	34	34	35	34	34	34	35	35	36	35
Qatar	32 (0.5)	32	32	32	32	33	33	32	33	32	32	32	32	32	32	32	32	33	32	33	34	33	32	33	32	32	32	33	33	34	33
Iran, Islamic Rep. of	31 (0.9)	31	31	31	31	32	32	31	32	32	31	31	31	31	31	31	31	32	31	32	33	32	31	32	31	31	31	32	32	32	32
Lebanon	30 (0.7)	30	30	30	31	30	31	30	30	30	30	30	30	30	31	31	30	31	30	30	31	30	30	31	30	30	30	31	31	34	31
Thailand	30 (1.0)	30	30	30	29	30	30	30	31	30	30	30	30	30	30	30	30	30	30	31	31	30	30	30	30	30	30	30	30	31	30
Chile	28 (0.5)	28	28	28	28	29	29	28	30	29	28	28	28	28	28	28	28	29	28	29	31	29	28	29	28	28	28	29	29	30	29
Oman	26 (0.4)	26	26	26	26	26	27	26	27	26	26	26	26	26	26	26	26	27	26	27	27	26	26	26	26	26	26	27	26	27	26
Kuwait	24 (0.8)	24	24	24	23	24	25	24	25	24	24	24	24	24	24	24	24	24	24	24	25	24	24	24	24	24	24	24	24	25	24
Jordan	23 (0.4)	23	23	23	23	24	24	23	24	23	23	23	23	23	23	23	23	24	23	23	24	23	23	23	23	23	23	24	24	24	24
Botswana (9)	23 (0.3)	23	23	23	23	24	24	23	25	24	23	23	23	23	23	23	23	24	23	24	25	24	23	24	23	23	23	24	23	25	23
Morocco	22 (0.3)	22	22	22	22	22	23	22	23	22	22	22	22	22	22	22	22	22	22	22	23	22	22	22	22	22	22	22	22	23	22
South Africa (9)	21 (0.7)	21	21	21	21	22	22	21	22	21	21	21	21	21	21	21	21	22	21	22	23	22	21	21	21	21	21	22	21	22	21
Saudi Arabia	21 (0.6)	21	20	20	20	21	21	20	22	21	21	21	21	21	20	20	21	21	21	21	22	21	21	20	21	21	21	21	21	21	21
International Avg.	42 (0.1)	42	42	42	42	42	43	42	43	42	42	42	42	42	42	42	42	42	42	43	44	42	42	43	42	42	42	42	42	44	42
Benchmarking Participants																															
Quebec, Canada	54 (1.0)	55	55	55	55	56	55	54	57	55	54	54	54	54	55	55	55	56	55	57	59	55	54	56	54	54	54	55	56	57	56
Ontario, Canada	49 (0.8)	49	49	49	49	50	49	49	53	50	49	49	49	49	49	50	50	50	50	52	53	50	49	50	49	49	49	50	50	51	50
Dubai, UAE	47 (0.5)	48	47	47	47	48	48	47	49	48	47	47	47	47	47	48	47	48	48	48	50	48	47	48	47	47	47	48	48	49	48
Florida, US	43 (1.5)	43	43	42	42	44	43	43	44	43	43	43	43	43	43	43	43	44	43	44	45	43	43	43	43	43	43	43	43	44	43
Abu Dhabi, UAE	32 (0.9)	33	33	33	33	33	33	32	34	33	32	32	32	33	33	33	33	33	33	34	35	33	32	33	33	33	33	33	33	34	33
Number of Items (Score Points) Identified*	221	215	210	217	190	196	203	217	188	214	218	221	220	216	202	192	210	210	212	184	177	211	221	185	219	219	217	211	206	152	208

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

* Of the 212 items in the Mathematics test, some extended-response items were scored on a two-point scale, resulting in 229 score points. Following item review, three items were deleted and the point value of three items were reduced, resulting in 209 items and 221 score points.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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Exhibit F.2: Average Percent Correct for the Test-Curriculum Matching Analysis, Eighth Grade (Continued)

Based on a subset of items specifically identified by each country as addressing its curriculum

Read across the row to compare that country's performance based on the test items included by each of the countries across the top. Read down the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the diagonal to compare performance for each different country based on its own decisions about the test items to include.

Country	Average Percent Correct on All Items	Chile	Oman	Kuwait	Jordan	Botswana (9)	Morocco	South Africa (9)	Saudi Arabia	Benchmarking Participants	Quebec, Canada	Ontario, Canada	Dubai, UAE	Florida, US	Abu Dhabi, UAE
Singapore	74 (0.8)	75	75	75	76	74	75	74	74		75	76	74	74	74
Korea, Rep. of	69 (0.6)	71	71	70	73	70	70	69	69		70	70	69	69	70
Chinese Taipei	68 (0.5)	69	69	69	71	68	69	68	68		69	69	68	68	68
Hong Kong SAR	68 (1.1)	70	69	69	71	68	69	68	68		69	70	68	68	68
Japan	65 (0.5)	66	66	66	69	66	65	65	65		66	67	65	65	65
Russian Federation	53 (1.3)	53	54	54	57	53	54	53	53		54	54	53	53	53
Kazakhstan	50 (1.4)	50	51	51	54	51	51	50	50		51	51	50	50	50
Canada	50 (0.6)	52	52	52	54	51	51	50	50		51	54	50	50	51
Ireland	49 (0.7)	52	51	51	53	50	50	49	49		51	53	49	49	50
United States	48 (0.8)	49	49	49	53	49	48	48	48		49	51	48	49	49
England	48 (1.1)	50	49	49	52	49	48	48	48		49	52	48	48	49
Hungary	48 (0.9)	50	50	49	52	49	49	48	48		49	51	48	48	49
Israel	47 (0.9)	48	48	48	51	48	47	47	47		48	49	47	47	48
Slovenia	47 (0.5)	49	49	49	51	48	48	47	47		49	51	47	47	48
Lithuania	46 (0.7)	48	48	47	50	46	47	46	46		47	49	46	46	47
Norway (9)	46 (0.6)	49	47	47	49	46	46	46	46		47	49	46	46	46
Australia	45 (0.7)	47	46	46	49	45	45	45	45		46	48	45	45	46
Malta	43 (0.3)	44	44	44	47	43	43	43	43		44	46	43	43	43
Sweden	43 (0.7)	45	45	44	46	43	43	43	43		44	46	43	43	43
New Zealand	42 (0.8)	44	44	43	46	43	42	42	42		43	45	42	42	43
Italy	42 (0.6)	44	43	43	46	42	43	42	42		43	45	42	42	42
United Arab Emirates	37 (0.4)	38	38	38	41	37	37	37	37		37	39	37	37	37
Malaysia	36 (0.8)	38	38	37	41	37	37	36	36		37	39	36	36	37
Turkey	36 (1.0)	37	36	37	40	36	36	36	36		37	38	36	36	36
Bahrain	35 (0.3)	35	35	35	40	35	34	35	35		35	36	35	35	35
Georgia	34 (0.7)	35	35	35	38	34	35	34	34		34	35	34	34	34
Qatar	32 (0.5)	33	33	33	36	32	32	32	32		33	34	32	32	32
Iran, Islamic Rep. of	31 (0.9)	32	32	32	35	31	32	31	31		32	33	31	31	32
Lebanon	30 (0.7)	31	31	31	34	30	31	30	30		31	30	30	30	30
Thailand	30 (1.0)	31	30	31	33	30	30	30	30		30	32	30	30	30
Chile	28 (0.5)	29	29	29	32	28	28	28	28		29	30	28	28	29
Oman	26 (0.4)	26	26	27	30	26	26	26	26		26	27	26	26	26
Kuwait	24 (0.8)	24	24	24	27	24	24	24	24		24	25	24	24	24
Jordan	23 (0.4)	23	23	24	27	23	23	23	23		23	24	23	23	23
Botswana (9)	23 (0.3)	24	24	24	27	23	23	23	23		23	25	23	23	23
Morocco	22 (0.3)	22	22	22	25	22	22	22	22		22	23	22	22	22
South Africa (9)	21 (0.7)	22	22	22	24	21	21	21	21		21	23	21	21	21
Saudi Arabia	21 (0.6)	21	20	21	24	21	20	21	21		20	22	21	21	21
International Avg.	42 (0.1)	43	43	43	45	42	42	42	42		42	44	42	42	42
Benchmarking Participants															
Quebec, Canada	54 (1.0)	57	57	56	58	55	55	54	54		56	58	54	54	55
Ontario, Canada	49 (0.8)	51	50	50	52	49	49	49	49		50	53	49	49	50
Dubai, UAE	47 (0.5)	48	48	48	51	48	47	47	47		48	49	47	47	48
Florida, US	43 (1.5)	43	43	43	47	43	42	43	43		43	45	43	43	43
Abu Dhabi, UAE	32 (0.9)	33	33	33	36	33	33	32	32		33	34	32	32	33
Number of Items (Score Points) Identified*	221	193	194	207	183	207	181	221	221		205	184	221	218	215

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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also had 75 percent correct on the items selected by Singapore and Korea, 74 percent on the items selected by Chinese Taipei, 76 percent on the items selected by Japan, and so forth.

The column for a country listed at the top shows how each of the other participants performed on the set of items selected as appropriate for that country's students. Using the set of items selected by England at the fourth grade as an example, 75 percent of these items, on average, were answered correctly by students in Hong Kong and Singapore, 74 percent by students in Korea, 71 percent by students in Chinese Taipei, 70 percent by students in Japan, 65 percent by those in Northern Ireland, and so forth. The shaded diagonal element in the exhibit shows how each country performed on the set of items that it selected based on its own curriculum. Thus, students from the England averaged 59 percent correct on the set of items identified by England for the analysis.

For each country's selected items, the international averages across participating countries are presented in the lower part of the exhibit. These show that the selections of items by the participating countries varied somewhat in average difficulty, ranging at the fourth grade from 49 percent correct (the most difficult) for those chosen by Chinese Taipei and Indonesia, to 53 percent correct (the least difficult) for those chosen by Denmark. At the eighth grade, the average percent correct ranged from 42 percent for many participants to 45 percent for those chosen by Jordan.

Comparing the diagonal element for a country with the overall average percent correct shows the difference between performance on the set of items chosen as appropriate for that country and performance on the test as a whole. In general, countries performed better on their own item sets than on the items overall, although not by much. To illustrate, the average percent correct for Singapore across all fourth grade mathematics items was 74 percent. The diagonal element shows that students from Singapore had a slightly greater average percent correct (76 percent) across the set of items selected as appropriate for Singapore than they did overall. Most participants had a difference of one or two percentage points between the two performance measures, with the largest differences in Bulgaria and the Slovak Republic (6 percentage points). At the eighth grade, the differences were generally smaller; the largest being in Canada, New Zealand, Lebanon, Jordan, and the province of Ontario (4 percentage points).

It is clear that the selection of items does not have a major effect on the relative performance among TIMSS participants. Participants that had relatively high or low performance across all the mathematics items also had relatively high or low performance on each of the various sets of items selected for the TCMA. For example, at the eighth grade, Singapore had the highest average percent correct, not only on the test as a whole, but also on all of the different item selections, with Korea, Chinese Taipei, Hong Kong SAR and Japan next in order of performance (with some ties) on practically all selections of items. Although there are some changes in the ordering of countries based on the items selected for the TCMA, most of these differences are within the boundaries of sampling error.[5]

5 Small differences in performance between adjacent countries shown in this exhibit usually are not statistically significant. The standard errors for the average percent correct statistics based on the TIMSS 2015 sample are provided in Exhibits F.3 and F.4. For any sample average shown in Exhibits F.1 and F.2, it can be said with 95 percent confidence that the corresponding value in the population falls between the sample estimate plus or minus two standard errors.

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Even when countries performed better on the items judged by them to be included in their curriculum than they did overall, their performance relative to other participants was changed little. As an example, consider the 154 score points selected by Slovenia at the fourth grade. The students in Slovenia did better on these items (54% correct) than on the test as a whole (51% correct). However, most other countries also did better on these particular items, with an international average of 52 percent correct compared with 50 percent correct overall. The countries that performed better than Slovenia on the overall test also performed as well or better on the items selected by Slovenia.

The TCMA results provide evidence that the TIMSS 2015 mathematics assessment provides a reasonable basis for comparing achievement of the participating countries and benchmarking entities. This result is not unexpected; making the assessment as fair as possible was a major consideration in test development. The fact that the majority of countries indicated that most items were appropriate for their students means that the different average percent correct estimates were based on many of the same items. Insofar as countries rejected items that would be difficult for their students, these items tended to be difficult for students in other countries as well. The analysis shows that omitting such items tends to improve the results for that country, but also tends to improve the results for all other countries, so that the overall pattern of relative performance is largely unaffected.

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Exhibit F.3: Standard Errors for the Test-Curriculum Matching Analysis, Fourth Grade

Based on a subset of items specifically identified by each country as addressing its curriculum

Read across the row to compare that country's performance based on the test items included by each of the countries across the top. Read down the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the diagonal to compare performance for each different country based on its own decisions about the test items to include.

Country	Average Percent Correct on All Items	Hong Kong SAR	Singapore	Korea, Rep. of	Chinese Taipei	Japan	Northern Ireland	Russian Federation	Ireland	Norway (5)	England	Belgium (Flemish)	Kazakhstan	Portugal	United States	Denmark	Lithuania	Finland	Hungary	Poland	Czech Republic	Netherlands	Bulgaria	Cyprus	Germany	Slovenia	Australia	Serbia	Sweden	Canada	Italy
Hong Kong SAR	75 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Singapore	74 (0.8)	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.9	0.8	0.8	0.8
Korea, Rep. of	73 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.5
Chinese Taipei	70 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4
Japan	70 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4
Northern Ireland	64 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Russian Federation	63 (0.9)	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9
Ireland	59 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.5	0.6	0.6
Norway (5)	59 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
England	58 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Belgium (Flemish)	58 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Kazakhstan	57 (1.2)	1.2	1.2	1.1	1.2	1.1	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.1	1.2	1.1	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2
Portugal	57 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
United States	57 (0.5)	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
Denmark	56 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Lithuania	56 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finland	55 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Hungary	55 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.8	0.8	0.7	0.7	0.8	0.7	0.8	0.8	0.7	0.7
Poland	55 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6
Czech Republic	53 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Netherlands	53 (0.5)	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bulgaria	53 (1.3)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Cyprus	53 (0.6)	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7
Germany	52 (0.5)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6
Slovenia	51 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Australia	51 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Serbia	51 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Sweden	51 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Canada	49 (0.5)	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.6
Italy	48 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Spain	47 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Croatia	47 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Slovak Republic	46 (0.5)	0.5	0.5	0.6	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.6
New Zealand	45 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Turkey	44 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
France	44 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Georgia	39 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
United Arab Emirates	38 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Chile	37 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bahrain	36 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Qatar	35 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Oman	33 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Iran, Islamic Rep. of	32 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Indonesia	26 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6
Morocco	25 (0.6)	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6
Saudi Arabia	25 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Kuwait	21 (0.6)	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7
International Avg.	50 (0.1)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benchmarking Participants																															
Florida, US	58 (1.2)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Quebec, Canada	55 (1.1)	1.1	1.1	1.1	1.0	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Dubai, UAE	50 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Ontario, Canada	50 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Abu Dhabi, UAE	32 (0.9)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Number of Items (Score Points) Identified*	178	140	138	137	149	132	169	118	156	176	158	140	123	178	170	146	158	166	165	153	157	142	130	165	145	154	144	144	138	178	166

* Of the 169 items in the Mathematics test, some extended-response items were scored on a two-point scale, resulting in 182 score points. Following item review, the point values of four items were reduced, resulting in 169 items and 178 score points.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Downloaded from timss2015.org/download-center

Exhibit F.3: Standard Errors for the Test-Curriculum Matching Analysis, Fourth Grade (Continued)

Based on a subset of items specifically identified by each country as addressing its curriculum

Read across the row to compare that country's performance based on the test items included by each of the countries across the top. Read down the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the diagonal to compare performance for each different country based on its own decisions about the test items to include.

Country	Average Percent Correct on All Items	Spain	Croatia	Slovak Republic	New Zealand	Turkey	France	Georgia	United Arab Emirates	Chile	Bahrain	Qatar	Oman	Iran, Islamic Rep. of	Indonesia	Morocco	Saudi Arabia	Kuwait	Benchmarking Participants: Florida, US	Quebec, Canada	Dubai, UAE	Ontario, Canada	Abu Dhabi, UAE
Hong Kong SAR	75 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Singapore	74 (0.8)	0.8	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9
Korea, Rep. of	73 (0.5)	0.4	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5
Chinese Taipei	70 (0.4)	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
Japan	70 (0.4)	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Northern Ireland	64 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Russian Federation	63 (0.9)	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.8	0.9	0.9	0.9
Ireland	59 (0.6)	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.6
Norway (5)	59 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
England	58 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Belgium (Flemish)	58 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Kazakhstan	57 (1.2)	1.2	1.1	1.1	1.2	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1
Portugal	57 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
United States	57 (0.5)	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.6
Denmark	56 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Lithuania	56 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finland	55 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Hungary	55 (0.7)	0.7	0.7	0.8	0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8
Poland	55 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6
Czech Republic	53 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
Netherlands	53 (0.5)	0.4	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bulgaria	53 (1.3)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Cyprus	53 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6
Germany	52 (0.5)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6
Slovenia	51 (0.5)	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Australia	51 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Serbia	51 (0.8)	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7
Sweden	51 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Canada	49 (0.5)	0.6	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.5
Italy	48 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Spain	47 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Croatia	47 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Slovak Republic	46 (0.5)	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.5	0.6	0.6
New Zealand	45 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Turkey	44 (0.7)	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
France	44 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Georgia	39 (0.8)	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
United Arab Emirates	38 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Chile	37 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bahrain	36 (0.4)	0.4	0.3	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Qatar	35 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Oman	33 (0.5)	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Iran, Islamic Rep. of	32 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Indonesia	26 (0.6)	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Morocco	25 (0.6)	0.6	0.7	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Saudi Arabia	25 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Kuwait	21 (0.6)	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.7	0.6	0.7	0.6	0.7	0.6
International Avg.	50 (0.1)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benchmarking Participants																							
Florida, US	58 (1.2)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Quebec, Canada	55 (1.1)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Dubai, UAE	50 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Ontario, Canada	50 (0.6)	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Abu Dhabi, UAE	32 (0.9)	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.9
Number of Items (Score Points) Identified*	178	160	111	102	132	172	166	146	178	169	175	170	130	168	142	129	178	161	170	149	178	125	127

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit F.4: Standard Errors for the Test-Curriculum Matching Analysis, Eighth Grade

Based on a subset of items specifically identified by each country as addressing its curriculum

Read across the row to compare that country's performance based on the test items included by each of the countries across the top. Read down the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the diagonal to compare performance for each different country based on its own decisions about the test items to include.

Country	Average Percent Correct on All Items	Singapore	Korea, Rep. of	Chinese Taipei	Hong Kong SAR	Japan	Russian Federation	Kazakhstan	Canada	Ireland	United States	England	Hungary	Israel	Slovenia	Lithuania	Norway (9)	Australia	Malta	Sweden	New Zealand	Italy	United Arab Emirates	Malaysia	Turkey	Bahrain	Georgia	Qatar	Iran, Islamic Rep. of	Lebanon	Thailand
Singapore	74 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Korea, Rep. of	69 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.6
Chinese Taipei	68 (0.5)	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
Hong Kong SAR	68 (1.1)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Japan	65 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Russian Federation	53 (1.3)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Kazakhstan	50 (1.4)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Canada	50 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Ireland	49 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
United States	48 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
England	48 (1.1)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Hungary	48 (0.9)	0.9	0.9	0.9	1.0	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9	1.0	0.9
Israel	47 (0.9)	1.0	1.0	0.9	1.0	0.9	1.0	1.0	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	1.0	0.9
Slovenia	47 (0.5)	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lithuania	46 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Norway (9)	46 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Australia	45 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Malta	43 (0.3)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Sweden	43 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
New Zealand	42 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Italy	42 (0.6)	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6
United Arab Emirates	37 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Malaysia	36 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Turkey	36 (1.0)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Bahrain	35 (0.3)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Georgia	34 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Qatar	32 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5
Iran, Islamic Rep. of	31 (0.9)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.9
Lebanon	30 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7
Thailand	30 (1.0)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Chile	28 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Oman	26 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Kuwait	24 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8
Jordan	23 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Botswana (9)	23 (0.3)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Morocco	22 (0.3)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
South Africa (9)	21 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7
Saudi Arabia	21 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
International Avg.	42 (0.1)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benchmarking Participants																															
Quebec, Canada	54 (1.0)	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0	1.1	1.0	1.1	1.1	1.1	1.1
Ontario, Canada	49 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Dubai, UAE	47 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Florida, US	43 (1.5)	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.6	1.6	1.6
Abu Dhabi, UAE	32 (0.9)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	0.9
Number of Items (Score Points) Identified*	221	215	210	217	190	196	203	217	188	214	218	221	220	216	202	192	210	210	212	184	177	211	221	185	219	219	217	211	206	152	208

* Of the 212 items in the Mathematics test, some extended-response items were scored on a two-point scale, resulting in 229 score points. Following item review, three items were deleted and the point value of three items were reduced, resulting in 209 items and 221 score points.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Exhibit F.4: Standard Errors for the Test-Curriculum Matching Analysis, Eighth Grade (Continued)

Based on a subset of items specifically identified by each country as addressing its curriculum

Read across the row to compare that country's performance based on the test items included by each of the countries across the top. Read down the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the diagonal to compare performance for each different country based on its own decisions about the test items to include.

Country	Average Percent Correct on All Items	Chile	Oman	Kuwait	Jordan	Botswana (9)	Morocco	South Africa (9)	Saudi Arabia	Benchmarking Participants	Quebec, Canada	Ontario, Canada	Dubai, UAE	Florida, US	Abu Dhabi, UAE
Singapore	74 (0.8)	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8		0.8	0.8	0.8	0.8	0.8
Korea, Rep. of	69 (0.6)	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6		0.5	0.5	0.6	0.6	0.6
Chinese Taipei	68 (0.5)	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.5		0.5	0.5	0.5	0.5	0.5
Hong Kong SAR	68 (1.1)	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1	1.1
Japan	65 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5
Russian Federation	53 (1.3)	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3		1.3	1.2	1.3	1.3	1.3
Kazakhstan	50 (1.4)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		1.4	1.4	1.4	1.4	1.4
Canada	50 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		0.6	0.6	0.6	0.6	0.6
Ireland	49 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7		0.7	0.7	0.7	0.7	0.7
United States	48 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8		0.8	0.8	0.8	0.8	0.8
England	48 (1.1)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1	1.1
Hungary	48 (0.9)	0.9	1.0	0.9	0.9	0.9	1.0	0.9	0.9		0.9	0.9	0.9	0.9	0.9
Israel	47 (0.9)	0.9	1.0	0.9	1.0	1.0	0.9	0.9	0.9		0.9	0.9	0.9	0.9	1.0
Slovenia	47 (0.5)	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.6	0.5	0.5	0.5
Lithuania	46 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7		0.7	0.7	0.7	0.7	0.7
Norway (9)	46 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		0.6	0.6	0.6	0.6	0.6
Australia	45 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7		0.7	0.7	0.7	0.7	0.7
Malta	43 (0.3)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		0.3	0.3	0.3	0.3	0.3
Sweden	43 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7		0.7	0.7	0.7	0.7	0.7
New Zealand	42 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8		0.8	0.8	0.8	0.8	0.8
Italy	42 (0.6)	0.7	0.7	0.7	0.6	0.6	0.7	0.6	0.6		0.6	0.7	0.6	0.6	0.6
United Arab Emirates	37 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4		0.4	0.4	0.4	0.4	0.4
Malaysia	36 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8		0.8	0.8	0.8	0.8	0.8
Turkey	36 (1.0)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0
Bahrain	35 (0.3)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		0.3	0.3	0.3	0.3	0.3
Georgia	34 (0.7)	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7		0.7	0.7	0.7	0.7	0.7
Qatar	32 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5
Iran, Islamic Rep. of	31 (0.9)	1.0	1.0	0.9	0.9	0.9	1.0	0.9	0.9		0.9	0.9	0.9	0.9	0.9
Lebanon	30 (0.7)	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.7		0.7	0.7	0.7	0.7	0.7
Thailand	30 (1.0)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0
Chile	28 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5
Oman	26 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4		0.4	0.4	0.4	0.4	0.4
Kuwait	24 (0.8)	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8		0.8	0.9	0.8	0.8	0.8
Jordan	23 (0.4)	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4		0.4	0.4	0.4	0.4	0.4
Botswana (9)	23 (0.3)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		0.3	0.3	0.3	0.3	0.3
Morocco	22 (0.3)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		0.3	0.3	0.3	0.3	0.3
South Africa (9)	21 (0.7)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7		0.7	0.7	0.7	0.7	0.7
Saudi Arabia	21 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		0.6	0.6	0.6	0.6	0.6
International Avg.	42 (0.1)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.1	0.1	0.1	0.1
Benchmarking Participants															
Quebec, Canada	54 (1.0)	1.1	1.1	1.1	1.1	1.0	1.1	1.0	1.0		1.1	1.1	1.0	1.1	1.1
Ontario, Canada	49 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8		0.8	0.8	0.8	0.8	0.8
Dubai, UAE	47 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5
Florida, US	43 (1.5)	1.6	1.6	1.5	1.5	1.6	1.6	1.5	1.5		1.5	1.6	1.5	1.5	1.5
Abu Dhabi, UAE	32 (0.9)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9		0.9	0.9	0.9	0.9	0.9
Number of Items (Score Points) Identified*	221	193	194	207	183	207	181	221	221		205	184	221	218	215

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Appendix G.1: Percentiles of Mathematics Achievement

Country	5th Percentile	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile	95th Percentile
Australia	374 (6.3)	408 (4.9)	462 (4.0)	521 (3.2)	575 (3.5)	622 (3.8)	649 (3.8)
Bahrain	299 (3.9)	335 (4.5)	393 (2.5)	455 (1.8)	512 (1.9)	561 (2.1)	591 (2.8)
Belgium (Flemish)	445 (4.0)	468 (3.5)	505 (2.7)	546 (2.1)	587 (2.7)	624 (3.0)	645 (3.6)
Bulgaria	373 (9.7)	413 (9.6)	475 (7.1)	531 (5.2)	581 (4.9)	624 (5.9)	649 (6.0)
Canada	382 (5.4)	413 (4.5)	462 (2.9)	514 (2.1)	562 (2.4)	604 (2.7)	629 (3.1)
Chile	337 (5.0)	363 (3.8)	408 (4.3)	460 (3.2)	509 (2.9)	551 (2.8)	577 (3.6)
Chinese Taipei	474 (4.0)	505 (3.3)	552 (2.9)	599 (2.3)	645 (2.8)	685 (2.8)	709 (4.0)
Croatia	390 (4.7)	415 (3.9)	460 (2.3)	505 (2.0)	548 (2.4)	584 (2.5)	605 (3.3)
Cyprus	382 (6.8)	415 (4.6)	471 (4.0)	527 (3.3)	579 (3.3)	623 (3.1)	648 (4.6)
Czech Republic	409 (5.6)	437 (2.8)	484 (3.3)	530 (3.0)	576 (2.4)	616 (3.0)	640 (4.3)
Denmark	408 (5.6)	440 (5.3)	490 (3.7)	542 (3.3)	591 (3.4)	633 (4.1)	656 (3.1)
England	407 (5.9)	438 (5.1)	490 (3.9)	547 (2.9)	602 (3.7)	651 (3.6)	682 (7.8)
Finland	421 (5.0)	448 (3.5)	492 (2.8)	538 (2.1)	582 (2.3)	619 (2.7)	639 (2.8)
France	361 (5.2)	390 (4.6)	438 (4.1)	491 (3.8)	540 (3.7)	584 (4.1)	607 (4.0)
Georgia	310 (7.3)	347 (6.8)	408 (6.2)	469 (4.1)	524 (4.1)	570 (5.8)	597 (6.5)
Germany	410 (5.4)	437 (4.1)	479 (2.7)	524 (2.0)	566 (2.2)	604 (3.0)	626 (3.0)
Hong Kong SAR	505 (5.5)	531 (5.0)	573 (3.8)	616 (3.7)	659 (3.1)	696 (4.1)	721 (5.4)
Hungary	372 (7.5)	412 (6.7)	475 (5.4)	537 (2.9)	591 (2.9)	635 (2.7)	660 (4.1)
Indonesia	244 (6.9)	280 (5.2)	339 (4.5)	401 (4.4)	461 (3.8)	509 (3.5)	537 (4.3)
Iran, Islamic Rep. of	248 (10.0)	290 (7.1)	367 (5.1)	441 (3.8)	504 (3.3)	555 (2.6)	583 (4.0)
Ireland	420 (4.0)	451 (4.4)	501 (3.6)	552 (2.7)	598 (3.6)	636 (4.0)	658 (4.0)
Italy	383 (5.5)	413 (4.8)	461 (4.3)	510 (2.7)	556 (2.9)	596 (2.6)	619 (4.8)
Japan	476 (3.9)	505 (2.6)	549 (2.0)	594 (2.3)	639 (2.6)	680 (3.2)	703 (4.3)
Jordan	192 (7.8)	240 (6.7)	320 (4.9)	400 (3.8)	465 (3.5)	518 (4.3)	547 (3.8)
Kazakhstan	413 (4.4)	440 (4.3)	487 (4.7)	543 (5.8)	599 (5.2)	650 (6.6)	682 (8.5)
Korea, Rep. of	494 (5.5)	522 (3.0)	565 (2.9)	611 (2.3)	653 (2.4)	691 (3.8)	715 (4.4)
Kuwait	180 (5.0)	217 (5.7)	281 (5.9)	354 (4.6)	426 (4.9)	487 (6.3)	522 (7.7)
Lithuania	411 (5.9)	441 (5.1)	489 (3.8)	540 (3.2)	584 (2.9)	624 (4.7)	646 (4.7)
Morocco	220 (6.1)	253 (4.4)	311 (3.6)	377 (3.6)	445 (4.6)	504 (4.6)	533 (6.1)
Netherlands	436 (3.7)	457 (2.7)	492 (2.4)	531 (2.1)	569 (2.0)	601 (2.7)	619 (3.6)
New Zealand	335 (5.2)	371 (4.6)	432 (4.1)	495 (2.9)	553 (2.0)	602 (3.2)	632 (4.7)
Northern Ireland	420 (6.8)	456 (5.3)	514 (4.2)	576 (3.5)	630 (3.1)	675 (3.3)	702 (4.6)
Norway (5)	430 (5.3)	459 (5.6)	504 (3.3)	550 (3.0)	597 (2.6)	638 (3.5)	661 (4.3)
Oman	256 (4.7)	293 (4.4)	356 (3.5)	428 (3.7)	496 (2.6)	553 (3.5)	587 (4.0)
Poland	412 (5.1)	441 (4.0)	487 (3.1)	539 (2.2)	585 (2.4)	624 (2.6)	645 (3.9)
Portugal	420 (4.2)	447 (3.9)	492 (2.9)	543 (2.7)	592 (3.0)	632 (3.1)	657 (3.3)
Qatar	279 (6.4)	312 (4.9)	372 (4.8)	441 (3.5)	506 (3.9)	563 (6.8)	597 (7.9)
Russian Federation	441 (6.0)	470 (5.4)	517 (3.7)	565 (3.6)	613 (4.2)	656 (5.8)	683 (7.7)
Saudi Arabia	233 (8.4)	264 (6.3)	321 (4.7)	383 (4.3)	446 (4.2)	502 (5.4)	534 (6.5)
Serbia	363 (9.4)	403 (7.4)	466 (4.8)	523 (3.8)	577 (3.5)	625 (3.6)	650 (3.3)
Singapore	458 (9.0)	502 (8.6)	566 (5.2)	625 (4.7)	677 (3.8)	722 (3.8)	746 (4.6)
Slovak Republic	354 (6.9)	391 (5.2)	450 (3.7)	506 (3.0)	552 (2.3)	593 (3.4)	618 (2.8)
Slovenia	401 (5.6)	430 (3.3)	476 (2.7)	522 (2.6)	568 (2.4)	605 (2.9)	629 (2.5)
South Africa (5)	219 (5.1)	250 (4.5)	303 (3.9)	369 (4.2)	443 (4.5)	513 (5.4)	554 (7.7)
Spain	388 (5.8)	414 (4.8)	459 (3.5)	508 (2.6)	554 (2.1)	592 (2.3)	614 (2.9)
Sweden	398 (7.0)	428 (4.9)	475 (3.9)	522 (2.6)	567 (3.2)	604 (3.1)	626 (3.6)
Turkey	311 (8.0)	354 (6.6)	424 (4.7)	492 (3.0)	551 (3.3)	598 (3.6)	623 (4.0)
United Arab Emirates	276 (3.9)	312 (3.5)	377 (3.1)	454 (2.9)	527 (3.2)	587 (3.4)	623 (3.7)
United States	398 (4.5)	432 (3.1)	485 (2.4)	543 (2.3)	596 (2.3)	640 (2.6)	667 (3.5)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
Note: Percentiles are defined in terms of percentages of students at or below a point on the scale.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix G.1: Percentiles of Mathematics Achievement (Continued)

Country	5th Percentile	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile	95th Percentile
Benchmarking Participants							
Buenos Aires, Argentina	295 (5.3)	325 (4.5)	377 (4.1)	436 (3.6)	490 (3.1)	534 (2.8)	559 (3.1)
Ontario, Canada	388 (4.5)	417 (4.4)	464 (3.1)	515 (2.3)	562 (2.9)	604 (3.5)	630 (4.2)
Quebec, Canada	428 (7.9)	451 (5.2)	492 (5.1)	536 (4.8)	580 (4.2)	620 (6.2)	644 (7.4)
Norway (4)	368 (7.1)	400 (5.4)	447 (3.2)	496 (3.0)	542 (2.6)	583 (2.9)	605 (4.1)
Abu Dhabi, UAE	247 (6.3)	279 (6.1)	338 (5.7)	418 (6.0)	499 (7.5)	561 (7.5)	599 (9.9)
Dubai, UAE	344 (3.2)	385 (3.0)	450 (2.4)	516 (1.6)	576 (2.6)	627 (2.5)	658 (4.5)
Florida, US	413 (8.2)	443 (6.9)	494 (6.3)	548 (5.7)	600 (6.1)	647 (7.5)	674 (6.8)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix G.2: Percentiles of Mathematics Achievement

Country	5th Percentile	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile	95th Percentile
Australia	365 (5.6)	397 (5.8)	449 (4.3)	507 (3.6)	563 (3.3)	610 (4.2)	637 (6.0)
Bahrain	324 (2.6)	352 (2.8)	399 (2.0)	453 (1.9)	507 (2.0)	557 (3.4)	588 (5.1)
Botswana (9)	245 (5.8)	278 (3.9)	337 (2.9)	395 (2.0)	449 (2.8)	496 (2.7)	523 (3.2)
Canada	406 (4.1)	434 (3.1)	482 (3.0)	531 (2.6)	576 (2.1)	613 (2.4)	635 (3.7)
Chile	297 (7.2)	323 (5.1)	372 (4.3)	427 (3.8)	482 (3.3)	531 (4.4)	560 (5.0)
Chinese Taipei	419 (5.3)	459 (3.8)	539 (3.3)	612 (2.7)	669 (3.2)	714 (3.7)	739 (4.1)
Egypt	229 (6.4)	265 (5.8)	322 (4.9)	393 (4.5)	463 (5.0)	521 (4.9)	553 (4.1)
England	389 (7.4)	414 (5.5)	460 (6.2)	517 (5.6)	577 (5.1)	624 (4.1)	649 (5.4)
Georgia	297 (7.9)	331 (5.0)	390 (4.4)	456 (4.3)	520 (4.4)	570 (3.5)	596 (3.6)
Hong Kong SAR	448 (11.1)	489 (9.3)	550 (5.1)	602 (3.8)	647 (4.6)	686 (5.0)	710 (6.0)
Hungary	355 (5.5)	390 (6.8)	452 (4.5)	518 (4.8)	582 (4.2)	632 (5.3)	660 (5.7)
Iran, Islamic Rep. of	286 (4.5)	316 (5.3)	369 (4.8)	434 (5.1)	501 (5.8)	560 (7.2)	594 (9.4)
Ireland	392 (7.5)	426 (6.0)	478 (3.4)	530 (2.9)	574 (2.6)	612 (4.0)	634 (4.7)
Israel	332 (8.2)	371 (5.8)	441 (5.8)	518 (5.0)	586 (4.6)	637 (3.9)	664 (4.6)
Italy	365 (5.5)	397 (4.4)	445 (3.9)	498 (2.6)	547 (3.1)	588 (3.5)	612 (3.4)
Japan	434 (4.8)	470 (4.5)	529 (3.0)	589 (2.9)	647 (3.2)	699 (3.7)	729 (3.4)
Jordan	228 (5.7)	263 (4.6)	321 (4.1)	387 (3.9)	452 (3.1)	505 (3.9)	535 (3.9)
Kazakhstan	373 (6.5)	404 (6.1)	463 (6.3)	530 (6.7)	593 (7.2)	645 (7.2)	677 (7.4)
Korea, Rep. of	455 (4.6)	491 (4.2)	551 (3.8)	611 (2.7)	665 (3.0)	711 (3.6)	738 (3.7)
Kuwait	247 (7.1)	279 (5.8)	330 (4.3)	389 (4.4)	452 (5.9)	512 (10.1)	550 (12.2)
Lebanon	319 (5.9)	345 (4.9)	390 (5.5)	443 (5.1)	497 (3.5)	539 (3.7)	565 (4.1)
Lithuania	379 (4.2)	409 (5.3)	458 (2.8)	515 (3.5)	568 (2.8)	608 (4.1)	632 (4.9)
Malaysia	326 (5.4)	353 (5.2)	402 (4.8)	464 (4.2)	528 (4.0)	580 (3.3)	609 (3.9)
Malta	330 (3.2)	370 (2.7)	436 (2.2)	504 (1.8)	558 (1.7)	601 (1.7)	623 (2.0)
Morocco	257 (3.7)	284 (3.4)	329 (2.5)	381 (2.9)	438 (2.6)	492 (3.2)	522 (4.5)
New Zealand	345 (5.6)	378 (5.8)	433 (4.3)	494 (3.5)	555 (3.2)	605 (4.6)	633 (5.5)
Norway (9)	392 (5.7)	420 (3.6)	465 (3.6)	515 (2.6)	560 (2.4)	600 (3.3)	622 (3.9)
Oman	241 (5.3)	278 (4.2)	339 (2.7)	405 (2.9)	470 (3.1)	527 (2.9)	557 (3.4)
Qatar	272 (5.4)	305 (4.5)	363 (4.0)	436 (4.0)	509 (3.4)	572 (4.7)	607 (5.6)
Russian Federation	399 (5.2)	429 (5.7)	483 (5.9)	542 (5.0)	594 (4.9)	641 (4.9)	669 (5.5)
Saudi Arabia	230 (7.9)	261 (7.4)	309 (5.1)	364 (4.9)	425 (5.0)	480 (6.9)	514 (8.9)
Singapore	462 (7.1)	505 (7.9)	572 (5.2)	633 (3.9)	680 (2.4)	715 (2.1)	735 (2.0)
Slovenia	400 (4.6)	425 (5.8)	470 (2.8)	518 (2.7)	564 (2.6)	605 (3.0)	629 (3.4)
South Africa (9)	242 (4.9)	267 (4.3)	311 (3.7)	364 (4.4)	426 (6.9)	491 (9.2)	529 (10.2)
Sweden	378 (6.4)	406 (6.0)	452 (3.4)	504 (3.6)	553 (3.7)	590 (3.5)	613 (4.1)
Thailand	296 (5.4)	322 (4.5)	369 (5.1)	425 (5.5)	486 (5.9)	549 (8.7)	590 (13.1)
Turkey	289 (7.5)	324 (6.1)	385 (5.1)	454 (5.0)	531 (5.9)	599 (7.1)	634 (7.2)
United Arab Emirates	303 (3.7)	336 (3.0)	395 (2.4)	466 (2.6)	535 (2.4)	591 (3.3)	623 (3.4)
United States	378 (3.8)	408 (4.5)	461 (3.4)	521 (3.6)	577 (3.6)	624 (4.4)	651 (4.8)
Benchmarking Participants							
Buenos Aires, Argentina	252 (7.4)	280 (5.9)	332 (6.3)	396 (4.4)	462 (5.6)	513 (4.9)	538 (5.2)
Ontario, Canada	399 (5.5)	428 (3.7)	475 (3.3)	526 (3.5)	572 (3.0)	610 (4.1)	632 (4.3)
Quebec, Canada	434 (8.5)	459 (7.3)	502 (5.6)	546 (4.5)	587 (3.8)	623 (3.5)	645 (3.4)
Norway (8)	373 (5.3)	399 (3.4)	444 (3.0)	491 (2.0)	533 (2.3)	568 (2.4)	589 (3.9)
Abu Dhabi, UAE	284 (6.5)	315 (7.3)	370 (5.1)	439 (6.2)	512 (5.7)	571 (8.5)	607 (8.8)
Dubai, UAE	354 (3.3)	390 (3.3)	451 (2.8)	518 (2.9)	576 (4.0)	624 (3.9)	652 (6.6)
Florida, US	346 (8.4)	376 (8.3)	431 (8.5)	493 (8.1)	557 (5.9)	608 (8.9)	641 (11.5)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
Note: Percentiles are defined in terms of percentages of students at or below a point on the scale.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix G.3: Standard Deviations of Mathematics Achievement

Country	Overall		Girls		Boys	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Australia	517 (3.1)	83 (1.8)	513 (3.1)	81 (1.9)	522 (3.9)	85 (2.3)
Bahrain	451 (1.6)	88 (1.1)	459 (1.7)	82 (1.5)	443 (2.3)	93 (1.5)
Belgium (Flemish)	546 (2.1)	61 (1.2)	543 (2.4)	60 (1.5)	549 (2.4)	61 (1.4)
Bulgaria	524 (5.3)	83 (2.6)	527 (5.7)	82 (2.8)	522 (5.1)	83 (2.9)
Canada	511 (2.3)	75 (1.9)	506 (2.5)	73 (1.9)	515 (2.6)	76 (2.1)
Chile	459 (2.4)	73 (1.5)	458 (2.8)	71 (1.8)	459 (3.0)	75 (1.7)
Chinese Taipei	597 (1.9)	71 (1.2)	594 (2.2)	67 (1.5)	599 (2.3)	74 (1.6)
Croatia	502 (1.8)	66 (1.0)	496 (2.1)	64 (1.4)	508 (2.3)	68 (1.8)
Cyprus	523 (2.7)	81 (1.2)	520 (2.9)	77 (1.4)	526 (3.1)	84 (1.7)
Czech Republic	528 (2.2)	70 (1.3)	525 (3.0)	69 (1.8)	532 (2.5)	70 (1.6)
Denmark	539 (2.7)	75 (1.6)	536 (3.1)	74 (2.0)	542 (3.0)	76 (2.1)
England	546 (2.8)	84 (2.2)	543 (3.0)	80 (2.4)	549 (3.3)	87 (2.6)
Finland	535 (2.0)	67 (1.2)	540 (2.3)	64 (1.3)	531 (2.6)	69 (1.8)
France	488 (2.9)	74 (1.3)	485 (3.2)	73 (1.8)	491 (3.2)	75 (1.4)
Georgia	463 (3.6)	87 (2.4)	465 (3.9)	84 (2.7)	461 (4.4)	89 (3.1)
Germany	522 (2.0)	65 (1.2)	520 (2.4)	64 (1.6)	523 (2.3)	66 (1.6)
Hong Kong SAR	615 (2.9)	66 (1.7)	609 (3.8)	64 (2.1)	619 (2.8)	67 (2.0)
Hungary	529 (3.2)	88 (2.3)	526 (3.4)	86 (2.3)	532 (3.8)	90 (3.0)
Indonesia	397 (3.7)	89 (1.8)	403 (4.0)	87 (2.1)	393 (3.9)	91 (2.2)
Iran, Islamic Rep. of	431 (3.2)	102 (2.3)	437 (4.5)	97 (2.6)	426 (4.5)	106 (3.1)
Ireland	547 (2.1)	73 (1.2)	545 (2.6)	71 (1.7)	549 (2.9)	75 (1.7)
Italy	507 (2.6)	72 (1.7)	497 (2.7)	70 (2.0)	517 (3.0)	72 (2.2)
Japan	593 (2.0)	69 (1.0)	593 (2.0)	66 (1.0)	593 (2.5)	72 (1.5)
Jordan	388 (3.1)	107 (1.9)	399 (3.3)	94 (1.9)	379 (4.9)	116 (2.7)
Kazakhstan	544 (4.5)	82 (2.1)	546 (4.6)	82 (2.1)	543 (4.8)	83 (2.6)
Korea, Rep. of	608 (2.2)	67 (1.4)	604 (2.3)	65 (1.6)	612 (2.5)	69 (1.7)
Kuwait	353 (4.6)	104 (2.0)	359 (5.4)	98 (2.3)	347 (5.6)	110 (2.5)
Lithuania	535 (2.5)	71 (1.5)	537 (2.8)	68 (1.8)	534 (3.1)	74 (2.1)
Morocco	377 (3.4)	96 (1.7)	378 (3.5)	95 (1.9)	377 (3.9)	97 (1.9)
Netherlands	530 (1.7)	56 (1.0)	526 (1.8)	55 (1.2)	534 (2.2)	57 (1.3)
New Zealand	491 (2.3)	90 (1.5)	489 (2.8)	86 (1.9)	492 (2.6)	93 (1.6)
Northern Ireland	570 (2.9)	86 (1.7)	569 (3.8)	85 (2.5)	571 (3.1)	86 (2.2)
Norway (5)	549 (2.5)	71 (1.4)	551 (2.6)	68 (1.8)	547 (3.1)	73 (1.9)
Oman	425 (2.5)	101 (1.3)	436 (3.0)	98 (1.7)	415 (2.8)	102 (1.7)
Poland	535 (2.1)	71 (1.1)	534 (2.3)	68 (1.5)	536 (2.7)	74 (1.6)
Portugal	541 (2.2)	72 (1.2)	536 (2.4)	70 (1.5)	547 (2.5)	74 (1.8)
Qatar	439 (3.4)	97 (2.3)	440 (4.1)	91 (2.8)	438 (4.9)	102 (3.1)
Russian Federation	564 (3.4)	73 (2.4)	564 (3.7)	73 (2.5)	564 (3.7)	73 (2.6)
Saudi Arabia	383 (4.1)	92 (2.2)	405 (4.4)	81 (2.2)	363 (6.5)	97 (3.8)
Serbia	518 (3.5)	87 (2.8)	520 (3.7)	82 (2.2)	517 (4.7)	91 (4.6)
Singapore	618 (3.8)	86 (2.6)	620 (3.9)	84 (2.7)	616 (4.3)	88 (2.9)
Slovak Republic	498 (2.5)	80 (1.7)	493 (3.0)	79 (2.3)	504 (2.6)	80 (1.7)
Slovenia	520 (1.9)	69 (1.5)	518 (2.1)	65 (1.7)	522 (2.4)	72 (1.7)
South Africa (5)	376 (3.5)	102 (2.0)	384 (3.8)	99 (2.5)	368 (4.4)	105 (2.6)
Spain	505 (2.5)	69 (1.3)	499 (2.7)	66 (1.5)	511 (2.7)	71 (1.6)
Sweden	519 (2.8)	69 (1.7)	519 (3.2)	69 (2.0)	518 (3.2)	69 (2.1)
Turkey	483 (3.1)	95 (2.5)	482 (3.2)	92 (2.7)	484 (3.5)	99 (2.8)
United Arab Emirates	452 (2.4)	105 (1.5)	453 (3.9)	101 (1.9)	450 (3.4)	109 (2.4)
United States	539 (2.3)	81 (1.3)	536 (2.3)	80 (1.2)	543 (2.6)	83 (1.7)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix G.3: Standard Deviations of Mathematics Achievement (Continued)

Country	Overall		Girls		Boys	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Benchmarking Participants						
Buenos Aires, Argentina	432 (2.9)	81 (1.4)	430 (3.5)	80 (1.6)	435 (2.9)	81 (1.7)
Ontario, Canada	512 (2.3)	72 (1.4)	509 (2.6)	72 (1.8)	516 (2.8)	73 (1.5)
Quebec, Canada	536 (4.0)	66 (1.7)	531 (3.9)	64 (1.8)	541 (4.8)	68 (2.1)
Norway (4)	493 (2.3)	72 (2.0)	492 (2.9)	69 (2.5)	494 (3.0)	74 (2.4)
Abu Dhabi, UAE	419 (4.7)	108 (3.2)	422 (8.0)	103 (3.7)	417 (6.6)	112 (3.8)
Dubai, UAE	511 (1.4)	94 (1.1)	510 (3.1)	89 (2.3)	512 (2.7)	99 (2.2)
Florida, US	546 (4.7)	79 (2.4)	548 (4.9)	77 (2.7)	544 (5.5)	81 (2.6)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix G.4: Standard Deviations of Mathematics Achievement

Country	Overall		Girls		Boys	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Australia	505 (3.1)	82 (1.9)	504 (3.8)	82 (2.2)	506 (3.5)	83 (2.1)
Bahrain	454 (1.4)	80 (1.4)	462 (2.4)	73 (1.6)	446 (2.2)	86 (2.0)
Botswana (9)	391 (2.0)	83 (1.1)	400 (2.5)	78 (1.5)	381 (2.5)	87 (1.6)
Canada	527 (2.2)	70 (1.3)	525 (2.0)	67 (1.2)	530 (2.7)	72 (1.8)
Chile	427 (3.2)	80 (1.9)	418 (3.7)	79 (1.9)	436 (4.2)	80 (2.5)
Chinese Taipei	599 (2.4)	97 (1.7)	599 (2.6)	94 (1.8)	599 (3.0)	100 (2.1)
Egypt	392 (4.1)	99 (2.0)	397 (5.5)	98 (2.5)	387 (5.1)	99 (2.7)
England	518 (4.2)	80 (2.6)	520 (5.2)	82 (2.7)	517 (4.8)	78 (3.3)
Georgia	453 (3.4)	92 (1.7)	454 (3.9)	87 (2.3)	453 (4.0)	96 (2.0)
Hong Kong SAR	594 (4.6)	78 (2.8)	591 (4.7)	73 (3.1)	597 (6.0)	83 (3.5)
Hungary	514 (3.8)	93 (2.2)	510 (4.3)	92 (2.4)	519 (4.0)	94 (2.8)
Iran, Islamic Rep. of	436 (4.6)	94 (2.7)	438 (5.0)	90 (2.9)	435 (7.5)	98 (4.6)
Ireland	523 (2.7)	74 (2.3)	521 (2.6)	71 (2.5)	526 (4.0)	76 (2.7)
Israel	511 (4.1)	102 (2.3)	510 (4.3)	98 (2.4)	512 (4.8)	106 (2.8)
Italy	494 (2.5)	75 (1.8)	491 (3.0)	73 (1.8)	498 (2.8)	76 (2.3)
Japan	586 (2.3)	89 (1.3)	588 (3.1)	87 (1.9)	585 (3.0)	90 (1.8)
Jordan	386 (3.2)	94 (1.7)	395 (4.0)	89 (1.9)	376 (5.4)	98 (2.3)
Kazakhstan	528 (5.3)	93 (2.3)	531 (5.8)	92 (2.9)	525 (5.3)	94 (2.5)
Korea, Rep. of	606 (2.6)	85 (1.1)	605 (2.6)	81 (1.4)	606 (3.1)	89 (1.5)
Kuwait	392 (4.6)	91 (3.3)	396 (4.6)	83 (3.5)	389 (7.1)	99 (3.9)
Lebanon	442 (3.6)	75 (1.7)	441 (3.7)	74 (1.8)	444 (4.5)	76 (2.2)
Lithuania	511 (2.8)	77 (1.5)	510 (3.4)	76 (1.9)	513 (3.1)	78 (1.8)
Malaysia	465 (3.6)	87 (2.1)	470 (3.8)	85 (2.3)	461 (3.8)	88 (2.2)
Malta	494 (1.0)	88 (0.9)	495 (1.8)	85 (1.1)	492 (1.6)	91 (1.3)
Morocco	384 (2.3)	80 (1.3)	385 (2.3)	80 (1.2)	384 (2.6)	80 (1.5)
New Zealand	493 (3.4)	88 (2.0)	494 (3.2)	84 (1.7)	491 (4.6)	92 (3.0)
Norway (9)	512 (2.3)	70 (1.2)	511 (2.5)	69 (1.7)	512 (2.7)	71 (1.4)
Oman	403 (2.4)	96 (1.3)	420 (2.9)	88 (1.5)	388 (3.5)	100 (1.7)
Qatar	437 (3.0)	102 (2.2)	440 (3.2)	96 (2.8)	434 (4.5)	108 (3.1)
Russian Federation	538 (4.7)	82 (1.8)	533 (5.1)	82 (2.1)	543 (4.6)	81 (1.9)
Saudi Arabia	368 (4.6)	86 (2.9)	375 (5.1)	79 (2.3)	360 (7.1)	93 (4.8)
Singapore	621 (3.2)	82 (2.2)	626 (3.4)	77 (2.4)	616 (3.8)	86 (2.4)
Slovenia	516 (2.1)	69 (1.4)	515 (2.4)	69 (1.8)	518 (2.5)	70 (1.7)
South Africa (9)	372 (4.5)	87 (3.0)	376 (5.3)	87 (3.5)	369 (4.6)	87 (3.3)
Sweden	501 (2.8)	72 (1.9)	497 (3.3)	71 (2.3)	504 (3.1)	72 (2.2)
Thailand	431 (4.8)	89 (3.4)	440 (5.2)	85 (3.7)	422 (5.7)	92 (3.8)
Turkey	458 (4.7)	105 (2.8)	461 (4.8)	105 (3.0)	455 (5.3)	106 (3.1)
United Arab Emirates	465 (2.0)	98 (1.5)	471 (3.5)	91 (1.5)	459 (4.0)	104 (1.9)
United States	518 (3.1)	83 (1.6)	517 (3.3)	81 (1.7)	519 (3.2)	85 (1.6)
Benchmarking Participants						
Buenos Aires, Argentina	396 (4.2)	89 (2.1)	391 (4.8)	89 (2.9)	401 (5.4)	88 (2.1)
Ontario, Canada	522 (2.9)	71 (1.5)	521 (2.9)	68 (1.6)	523 (3.3)	73 (2.1)
Quebec, Canada	543 (3.9)	64 (2.4)	538 (3.8)	63 (1.8)	550 (5.1)	65 (4.1)
Norway (8)	487 (2.0)	66 (1.3)	486 (2.4)	64 (1.3)	487 (2.3)	67 (1.8)
Abu Dhabi, UAE	442 (4.7)	99 (2.9)	457 (6.0)	90 (2.5)	427 (7.7)	104 (3.9)
Dubai, UAE	512 (2.1)	91 (1.8)	510 (3.7)	89 (2.2)	514 (4.3)	93 (2.7)
Florida, US	493 (6.4)	90 (3.2)	494 (7.2)	86 (3.4)	493 (6.5)	93 (3.7)

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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Appendix H: Organizations and Individuals Responsible for TIMSS 2015

Introduction

TIMSS 2015 was a collaborative effort involving hundreds of individuals around the world. This appendix acknowledges the individuals and organizations for their contributions. Given that work on TIMSS 2015 has spanned approximately four years and has involved so many people and organizations, this list may not include all who contributed. Any omission is inadvertent. TIMSS 2015 also acknowledges the students, parents, teachers, and school principals who contributed their time and effort to the study. This report would not be possible without them.

Management and Coordination

TIMSS is a major undertaking of IEA, and together with the Progress in International Reading Literacy Study (PIRLS), comprises the core of IEA's regular cycles of studies. The TIMSS assessment at the fourth grade complements PIRLS, which regularly assesses reading achievement at fourth grade.

TIMSS was conducted by IEA's TIMSS & PIRLS International Study Center at Boston College, which has responsibility for the overall direction and management of the TIMSS and PIRLS projects, including design, development, and implementation. Headed by Executive Directors Drs. Ina V.S. Mullis and Michael O. Martin, the study center is located in the Lynch School of Education. In carrying out the project, the TIMSS & PIRLS International Study Center worked closely with the IEA Secretariat in Amsterdam, which managed country participation, was responsible for verification of all translations produced by the participating countries, and coordinated the school visits by International Quality Control Monitors. Staff at the IEA Data Processing and Research Center in Hamburg worked closely with participating countries to organize sampling and data collection operations and to check all data for accuracy and consistency within and across countries; Statistics Canada in Ottawa was responsible for school and student sampling activities; and Educational Testing Service in Princeton, New Jersey consulted on psychometric methodology, provided software for scaling the achievement data, and replicated the achievement scaling for quality assurance.

The Project Management Team, comprising the study directors and representatives from the TIMSS & PIRLS International Study Center, IEA Secretariat and IEA Data Processing and Research

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Center, Statistics Canada, and ETS met twice a year throughout the study to discuss the study's progress, procedures, and schedule. In addition, the study directors met with members of IEA's Technical Executive Group twice yearly to review technical issues.

To work with the international team and coordinate within-country activities, each participating country designates an individual to be the TIMSS National Research Coordinator (NRC). The NRCs have the challenging task of implementing TIMSS in their countries in accordance with the TIMSS guidelines and procedures. In addition, the NRCs provide feedback and contributions throughout the development of the TIMSS assessment. The quality of the TIMSS assessment and data depends on the work of the NRCs and their colleagues in carrying out the complex sampling, data collection, and scoring tasks involved. Continuing the tradition of exemplary work established in previous cycles of TIMSS, the TIMSS 2015 NRCs performed their many tasks with dedication, competence, energy, and goodwill, and have been commended by the IEA Secretariat, the TIMSS & PIRLS International Study Center, the IEA Data Processing and Research Center, and Statistics Canada for their commitment to the project and the high quality of their work.

Funding

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Pierre Foy, *Director of Sampling, Psychometrics, and Data Analysis*
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Ieva Johansone, *Associate Research Director, Operations and Quality Control*
Marcie Bligh, *Manager, Events and Administration*
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