

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		Geometric Shapes and Measures Average Scale Score	Geometric Shapes and Measures		Data Display Average Scale Score	Data Display	
		Differences Between Years			Differences Between Years			Differences Between Years	
		2011	2007		2011	2007		2011	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.

✳ 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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Country	Number Average Scale Score	Number		Geometric Shapes and Measures Average Scale Score	Geometric Shapes and Measures		Data Display Average Scale Score	Data Display	
		Differences Between Years			Differences Between Years			Differences Between Years	
		2011	2007		2011	2007		2011	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									
² 2015	552 (4.0)	37 ▲		540 (5.8)	48 ▲		524 (5.3)	48 ▲	
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 Ⓜ 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 ▲	
Ⓜ 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

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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		Geometric Shapes and Measures Average Scale Score	Geometric Shapes and Measures		Data Display Average Scale Score	Data Display	
		Differences Between Years			Differences Between Years			Differences Between Years	
		2011	2007		2011	2007		2011	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

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		Differences Between Years			Differences Between Years			Differences Between Years		
		2011	2007		2011	2007		2011	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

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