Exhibit 3.3: Achievement in Science Cognitive Domains

Country	Overall Science Average Scale Score	Knowing (67 items)		Applying (66 items)		Reasoning (35 items)	
		Average Scale Score	Difference from Overall Science Score	Average Scale Score	Difference from Overall Science Score	Average Scale Score	Difference from Overall Science Score
[2] Singapore	590 (3.7)	574 (4.1)	-16 (1.3) ▼	599 (4.0)	9 (1.3) ▲	605 (3.6)	15 (1.8) ▲
Korea, Rep. of	589 (2.0)	582 (2.2)	-8 (1.2) ▼	594 (1.9)	4 (1.8) ▲	594 (2.2)	5 (1.6) ▲
Japan	569 (1.8)	544 (2.3)	-25 (1.3) ▼	576 (1.8)	7 (0.8) ▲	594 (1.8)	25 (1.6) ▲
Russian Federation	567 (3.2)	569 (3.9)	1 (1.9)	568 (3.3)	1 (1.3)	561 (3.8)	-7 (2.5) ▼
† Hong Kong SAR	557 (2.9)	562 (3.0)	5 (1.9) ▲	554 (3.3)	-3 (1.6)	552 (4.1)	-4 (2.5)
Chinese Taipei	555 (1.8)	557 (2.5)	2 (1.6)	553 (2.6)	-2 (1.8)	558 (3.1)	3 (2.3)
Finland	554 (2.3)	556 (3.1)	2 (1.6)	553 (2.4)	-1 (1.9)	552 (2.3)	-2 (1.5)
Kazakhstan	550 (4.4)	551 (5.0)	1 (2.4)	547 (4.6)	-3 (2.1)	552 (4.5)	2 (1.5)
Poland	547 (2.4)	544 (2.5)	-4 (1.1) ▼	554 (2.8)	7 (2.2) ▲	542 (3.2)	-5 (2.0) ▼
[2] † United States	546 (2.2)	548 (2.5)	2 (0.7) ▲	546 (2.2)	0 (1.3)	542 (2.7)	-4 (1.4) ▼
Slovenia	543 (2.4)	541 (2.6)	-2 (1.4)	546 (2.9)	3 (1.9)	538 (2.7)	-4 (2.2) ▼
Hungary	542 (3.3)	550 (3.8)	8 (1.2) ▲	539 (3.4)	-3 (1.1) ▼	533 (3.9)	-9 (1.6) ▼
[2] Sweden	540 (3.6)	538 (3.8)	-2 (1.1)	540 (3.4)	0 (1.5)	542 (3.8)	2 (3.0)
Norway (5)	538 (2.6)	533 (3.0)	-5 (1.6) ▼	542 (2.9)	4 (1.0) ▲	537 (3.8)	-1 (2.8)
England	536 (2.4)	533 (2.6)	-3 (1.3)	538 (2.7)	2 (1.3)	539 (2.7)	3 (1.7)
Bulgaria	536 (5.9)	551 (6.5)	15 (2.2) ▲	536 (6.2)	0 (1.2)	507 (6.4)	-29 (1.5) ▼
Czech Republic	534 (2.4)	545 (3.0)	10 (1.9) ▲	528 (2.1)	-6 (1.6) ▼	529 (2.4)	-6 (1.4) ▼
Croatia	533 (2.1)	534 (2.9)	1 (1.7)	530 (2.2)	-3 (1.7)	536 (2.4)	2 (2.5)
Ireland	529 (2.4)	529 (2.5)	0 (1.0)	530 (2.5)	1 (1.5)	526 (2.9)	-3 (2.0)
Germany	528 (2.4)	527 (2.8)	-1 (1.5)	529 (2.4)	0 (1.0)	532 (2.3)	3 (1.8)
[2] Lithuania	528 (2.5)	524 (3.0)	-4 (2.4)	526 (2.4)	-1 (1.2)	538 (3.0)	10 (2.4) ▲
[2] † Denmark	527 (2.1)	524 (2.6)	-3 (1.7)	529 (2.4)	2 (1.3)	526 (2.9)	-1 (2.7)
[1] [2] † Canada	525 (2.6)	523 (3.1)	-2 (1.8)	528 (2.6)	3 (0.9) ▲	524 (2.6)	0 (1.3)
[3] Serbia	525 (3.7)	527 (3.9)	2 (1.4)	522 (4.5)	-3 (1.8)	521 (3.9)	-4 (2.9)
Australia	524 (2.9)	523 (3.3)	-1 (1.7)	522 (2.7)	-1 (1.3)	527 (3.0)	4 (1.6) ▲
Slovak Republic	520 (2.6)	530 (3.3)	9 (1.5) ▲	517 (2.8)	-4 (1.1) ▼	507 (3.4)	-13 (2.3) ▼
‡ Northern Ireland	520 (2.2)	518 (2.9)	-1 (1.7)	519 (2.9)	-1 (1.9)	520 (2.6)	0 (1.7)
[2] Spain	518 (2.6)	522 (3.3)	4 (2.0) ▲	514 (3.3)	-4 (2.0) ▼	517 (2.6)	-2 (1.2)
† Netherlands	517 (2.7)	508 (2.4)	-9 (1.3) ▼	519 (2.4)	2 (1.4)	526 (2.9)	9 (2.3) ▲
[2] Italy	516 (2.6)	521 (3.1)	4 (1.4) ▲	513 (3.1)	-3 (1.3) ▼	511 (3.5)	-5 (2.2) ▼
† Belgium (Flemish)	512 (2.3)	498 (2.7)	-14 (1.3) ▼	513 (2.5)	2 (0.9) ▲	526 (2.9)	14 (2.0) ▲
[2] Portugal	508 (2.2)	507 (2.9)	-1 (2.5)	508 (1.9)	0 (1.8)	506 (1.9)	-2 (2.4)
New Zealand	506 (2.7)	504 (2.8)	-2 (2.2)	502 (3.1)	-3 (1.5) ▼	514 (2.4)	8 (1.0) ▲
France	487 (2.7)	482 (3.8)	-6 (2.0) ▼	494 (3.1)	6 (1.6) ▲	481 (2.8)	-6 (1.4) ▼
Turkey	483 (3.3)	478 (3.0)	-6 (1.2) ▼	486 (3.1)	3 (1.3) ▲	483 (3.3)	0 (1.7)
Cyprus	481 (2.6)	467 (3.2)	-14 (2.1) ▼	489 (3.4)	8 (1.9) ▲	490 (3.6)	8 (2.6) ▲
Chile	478 (2.7)	477 (3.2)	0 (1.9)	476 (3.0)	-2 (1.4)	477 (2.5)	-1 (2.5)
[2] Bahrain	459 (2.6)	456 (2.5)	-3 (1.8)	462 (3.0)	3 (2.0)	455 (3.0)	-4 (2.1)
[1] Georgia	451 (3.7)	460 (4.2)	8 (1.6) ▲	449 (4.8)	-2 (2.2)	426 (4.0)	-26 (1.6) ▼
United Arab Emirates	451 (2.8)	453 (3.3)	2 (1.0) ▲	452 (3.2)	1 (1.0)	444 (3.0)	-7 (1.2) ▼
Qatar	436 (4.1)	437 (4.5)	1 (2.5)	430 (4.7)	-6 (1.8) ▼	433 (4.4)	-3 (2.2)
Oman	431 (3.1)	422 (3.2)	-9 (2.1) ▼	435 (2.9)	4 (1.7) ▲	431 (3.0)	0 (1.3)
Iran, Islamic Rep. of	421 (4.0)	416 (4.1)	-5 (2.4)	417 (4.5)	-4 (3.3)	422 (4.9)	1 (2.5)
Indonesia	397 (4.8)	397 (4.9)	1 (2.4)	392 (5.3)	-5 (3.0)	390 (5.5)	-7 (1.9) ▼
Saudi Arabia	390 (4.9)	394 (5.3)	4 (2.5)	388 (4.7)	-3 (2.3)	365 (5.4)	-25 (4.2) ▼
ψ Morocco	352 (4.7)	331 (5.6)	-21 (2.4) ▼	357 (4.7)	5 (1.9) ▲	354 (4.7)	2 (2.4)
ψ Kuwait	337 (6.2)	343 (6.4)	6 (2.4) ▲	324 (7.3)	-13 (3.2) ▼	297 (8.1)	-40 (4.4) ▼

▲ Subscale score significantly higher than overall science score

▼ Subscale score significantly lower than overall science score

Numbers of items are based on the TIMSS 2015 fourth grade science 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

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

Exhibit 3.3: Achievement in Science Cognitive Domains (Continued)

Country	Overall Science Average Scale Score	Knowing (67 items)		Applying (66 items)		Reasoning (35 items)	
		Average Scale Score	Difference from Overall Science Score	Average Scale Score	Difference from Overall Science Score	Average Scale Score	Difference from Overall Science Score
Benchmarking Participants							
[1] Florida, US	549 (4.8)	553 (5.7)	5 (2.9)	550 (4.9)	1 (1.5)	541 (5.8)	-8 (3.2) ▼
Ontario, Canada	530 (2.5)	527 (2.8)	-3 (1.8)	534 (2.5)	4 (1.1) ⬤	529 (2.8)	-1 (1.3)
‡ Quebec, Canada	525 (4.1)	524 (4.3)	-1 (2.2)	525 (4.5)	1 (2.0)	526 (4.6)	2 (3.5)
Dubai, UAE	518 (1.8)	523 (2.3)	5 (1.4) ⬤	517 (2.8)	-1 (1.8)	510 (2.9)	-8 (2.1) ▼
Norway (4)	493 (2.2)	495 (3.0)	2 (2.3)	494 (2.4)	1 (1.0)	482 (3.2)	-11 (2.4) ▼
Buenos Aires, Argentina	418 (4.7)	417 (4.4)	-1 (1.9)	416 (4.6)	-1 (2.6)	416 (5.0)	-2 (5.4)
[2] Abu Dhabi, UAE	415 (5.6)	410 (6.6)	-4 (2.1) ▼	417 (5.9)	2 (1.9)	412 (5.3)	-3 (2.0)

⬤ Subscale score significantly higher than overall science score

▼ Subscale score significantly lower than overall science score

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