

Exhibit 2.17: Average Achievement in Science Cognitive Domains

Country	Overall Science Average Scale Score	Knowing (69 Items)		Applying (64 Items)		Reasoning (36 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
<sup>3</sup> Singapore	595 (3.4)	588 (3.7)	-7 (0.9) ▽	595 (3.7)	1 (1.6)	604 (3.5)	9 (1.2) ▲
Korea, Rep. of	588 (2.1)	584 (2.5)	-3 (1.8)	596 (2.6)	8 (1.5) ▲	581 (2.4)	-6 (1.4) ▽
<sup>2</sup> Russian Federation	567 (3.0)	562 (3.3)	-5 (1.7) ▽	572 (3.4)	5 (1.3) ▲	569 (2.8)	2 (1.7)
Japan	562 (1.8)	535 (2.6)	-27 (1.6) ▽	576 (2.2)	15 (1.3) ▲	580 (2.4)	18 (2.2) ▲
Chinese Taipei	558 (1.8)	560 (1.9)	2 (1.3)	561 (2.0)	2 (0.9) ▲	552 (2.7)	-6 (2.0) ▽
Finland	555 (2.6)	553 (2.5)	-1 (1.4)	551 (2.5)	-4 (1.5) ▽	563 (2.4)	8 (1.6) ▲
<sup>2</sup> Latvia	542 (2.4)	539 (3.2)	-3 (2.0)	540 (2.6)	-2 (0.9) ▽	547 (2.5)	5 (1.2) ▲
<sup>†</sup> Norway (5)	539 (2.2)	540 (2.5)	1 (1.6)	537 (2.4)	-3 (1.1) ▽	540 (2.5)	0 (1.3)
<sup>†</sup> United States	539 (2.7)	542 (2.7)	3 (1.7) ▲	535 (3.1)	-4 (0.9) ▽	538 (2.7)	0 (1.2)
<sup>2</sup> Lithuania	538 (2.5)	539 (3.1)	1 (1.7)	531 (2.3)	-7 (1.3) ▽	548 (2.9)	10 (2.6) ▲
Sweden	537 (3.3)	540 (3.4)	3 (2.2)	532 (3.1)	-5 (1.2) ▽	541 (3.2)	4 (1.1) ▲
<sup>2</sup> England	537 (2.7)	544 (3.3)	7 (1.5) ▲	526 (3.0)	-11 (1.4) ▽	544 (3.7)	6 (2.8) ▲
Czech Republic	534 (2.6)	538 (2.9)	5 (1.6) ▲	526 (2.5)	-7 (1.8) ▽	539 (3.2)	5 (3.2)
Australia	533 (2.4)	538 (3.0)	5 (1.9) ▲	524 (3.2)	-9 (1.9) ▽	538 (3.0)	5 (1.7) ▲
<sup>†</sup> Hong Kong SAR	531 (3.3)	537 (3.2)	6 (1.6) ▲	526 (3.1)	-5 (1.8) ▽	531 (3.6)	-1 (2.2)
Poland	531 (2.6)	524 (2.6)	-6 (0.9) ▽	538 (2.5)	7 (1.1) ▲	525 (2.6)	-5 (1.9) ▽
Hungary	529 (2.7)	533 (2.7)	4 (1.4) ▲	526 (3.1)	-4 (2.1)	532 (2.6)	2 (1.2) ▲
Ireland	528 (3.2)	532 (3.4)	4 (1.6) ▲	525 (3.0)	-3 (1.4)	525 (3.8)	-3 (2.1)
<sup>2</sup> Turkey (5)	526 (4.2)	531 (4.5)	4 (1.5) ▲	528 (4.3)	2 (1.1)	521 (4.1)	-6 (1.7) ▽
Croatia	524 (2.2)	526 (2.4)	3 (1.6)	521 (2.3)	-3 (1.6)	522 (2.5)	-2 (2.0)
<sup>1,2</sup> Canada	523 (1.9)	524 (1.9)	1 (1.5)	520 (2.0)	-3 (1.0) ▽	526 (1.8)	2 (1.8)
<sup>†</sup> Denmark	522 (2.4)	521 (2.0)	-1 (2.3)	519 (2.5)	-3 (1.1) ▽	527 (2.7)	5 (1.7) ▲
Austria	522 (2.6)	523 (3.1)	1 (1.4)	523 (2.4)	1 (1.4)	518 (3.3)	-4 (1.9) ▽
Bulgaria	521 (4.9)	526 (5.4)	5 (1.9) ▲	523 (5.4)	1 (1.6)	508 (5.5)	-14 (1.7) ▽
<sup>2</sup> Slovak Republic	521 (3.7)	527 (3.9)	6 (1.4) ▲	515 (4.3)	-5 (1.9) ▽	516 (4.2)	-5 (2.1) ▽
<sup>†</sup> Northern Ireland	518 (2.3)	523 (2.9)	4 (2.7)	514 (2.3)	-4 (1.2) ▽	519 (3.2)	1 (2.1)
<sup>≡</sup> Netherlands	518 (2.9)	515 (2.8)	-4 (1.9) ▽	517 (3.1)	-1 (2.2)	523 (3.2)	5 (2.0) ▲
Germany	518 (2.2)	520 (2.3)	1 (0.9)	516 (2.5)	-2 (1.7)	519 (2.9)	0 (1.8)
<sup>2</sup> Serbia	517 (3.5)	506 (3.3)	-11 (1.9) ▽	526 (3.9)	9 (1.4) ▲	518 (3.9)	1 (2.4)
Cyprus	511 (3.0)	503 (3.3)	-9 (1.1) ▽	519 (3.0)	8 (1.4) ▲	511 (3.2)	-1 (2.3)
Spain	511 (2.0)	514 (2.2)	3 (1.0) ▲	511 (2.0)	-1 (0.9)	507 (1.8)	-5 (1.5) ▽
Italy	510 (3.0)	515 (3.0)	5 (1.5) ▲	504 (2.7)	-6 (1.0) ▽	508 (2.7)	-2 (1.8)
<sup>2</sup> Portugal	504 (2.6)	502 (2.8)	-1 (2.5)	502 (3.1)	-2 (2.1)	504 (2.0)	0 (1.5)
<sup>2</sup> New Zealand	503 (2.3)	505 (2.7)	2 (1.2) ▲	497 (2.6)	-5 (1.0) ▽	505 (2.6)	2 (2.1)
<sup>†</sup> Belgium (Flemish)	501 (2.1)	493 (2.7)	-8 (1.7) ▽	501 (2.2)	0 (1.2)	511 (2.4)	10 (1.9) ▲
Malta	496 (1.3)	496 (1.6)	1 (1.4)	496 (2.7)	0 (2.2)	490 (3.8)	-6 (3.5)
<sup>2</sup> Kazakhstan	494 (3.1)	489 (2.9)	-6 (1.7) ▽	494 (3.4)	0 (1.6)	502 (3.4)	8 (2.7) ▲
Bahrain	493 (3.4)	496 (3.7)	4 (1.6) ▲	494 (3.4)	2 (1.6)	482 (3.6)	-11 (2.5) ▽
Albania	489 (3.5)	494 (3.9)	4 (1.5) ▲	485 (3.8)	-4 (2.3)	487 (3.6)	-2 (1.8)
France	488 (3.0)	485 (3.6)	-2 (1.9) ▽	495 (3.0)	7 (1.1) ▲	475 (4.7)	-13 (4.0) ▽
United Arab Emirates	473 (2.1)	482 (2.2)	9 (0.7) ▲	470 (2.1)	-3 (0.9) ▽	462 (1.9)	-11 (1.2) ▽
Chile	469 (2.6)	473 (3.7)	4 (2.3)	461 (3.4)	-8 (1.7) ▽	472 (2.7)	3 (1.6)
Armenia	466 (3.4)	463 (3.4)	-3 (1.6)	453 (3.3)	-13 (1.4) ▽	486 (3.6)	19 (3.5) ▲
Bosnia and Herzegovina	459 (2.9)	451 (3.2)	-7 (1.3) ▽	459 (3.0)	0 (1.1)	469 (3.0)	10 (1.8) ▲
<sup>1</sup> Georgia	454 (3.9)	452 (3.9)	-3 (2.2)	445 (3.7)	-9 (2.1) ▽	465 (4.4)	11 (2.2) ▲
Montenegro	453 (2.5)	451 (3.2)	-2 (1.4)	454 (2.7)	0 (1.9)	451 (3.3)	-2 (1.7)
Qatar	449 (3.9)	455 (4.4)	5 (1.4) ▲	451 (4.2)	1 (1.5)	434 (4.3)	-16 (2.4) ▽
Iran, Islamic Rep. of	441 (4.1)	444 (4.6)	3 (1.7) ▲	440 (4.3)	0 (2.1)	433 (4.9)	-8 (3.1) ▽
Oman	435 (4.1)	-	-	-	-	-	-
Azerbaijan	427 (3.3)	425 (4.0)	-2 (2.1)	419 (4.5)	-8 (2.7) ▽	430 (3.5)	3 (1.4) ▲
North Macedonia	426 (6.2)	-	-	-	-	-	-
<sup>2</sup> Kosovo	413 (3.7)	419 (4.5)	6 (2.2) ▲	406 (3.7)	-7 (1.3) ▽	402 (4.2)	-11 (2.3) ▽
<sup>2</sup> Saudi Arabia	402 (4.1)	-	-	-	-	-	-
Kuwait	392 (6.1)	-	-	-	-	-	-
<sup>ψ</sup> Morocco	374 (5.8)	362 (6.1)	-12 (1.5) ▽	378 (6.2)	4 (1.7) ▲	366 (5.5)	-9 (2.0) ▽
<sup>✳</sup> South Africa (5)	324 (4.9)	-	-	-	-	-	-
<sup>2✳</sup> Pakistan	290 (13.4)	-	-	-	-	-	-
<sup>2✳</sup> Philippines	249 (7.5)	-	-	-	-	-	-
<b>Benchmarking Participants</b>							
Moscow City, Russian Fed.	595 (2.2)	592 (2.1)	-3 (1.2) ▽	603 (2.4)	8 (1.0) ▲	592 (2.9)	-3 (2.1)
<sup>2</sup> Dubai, UAE	545 (1.7)	560 (2.1)	15 (0.8) ▲	541 (2.3)	-4 (1.5) ▽	531 (2.1)	-13 (1.5) ▽
<sup>2</sup> Ontario, Canada	524 (3.2)	525 (3.1)	1 (2.3)	520 (3.1)	-4 (1.2) ▽	528 (3.0)	4 (2.3)
Madrid, Spain	523 (2.0)	523 (3.7)	0 (3.3)	521 (3.8)	-1 (3.5)	520 (3.7)	-3 (3.2)
Quebec, Canada	522 (2.5)	523 (2.8)	1 (1.9)	520 (3.6)	-2 (2.6)	525 (3.0)	3 (3.2)
Abu Dhabi, UAE	418 (2.8)	422 (2.9)	4 (1.7) ▲	415 (3.0)	-3 (1.9)	411 (2.7)	-7 (2.6) ▽

▲ Subscale score significantly higher than overall science score

▽ Subscale score significantly lower than overall science score

Numbers of items are based on the TIMSS 2019 fourth grade science eAssessment items included in scaling.

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

See Appendix B.2 for target population coverage notes 1, 2, and 3. See Appendix B.5 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 because average achievement could not be accurately estimated.