

Exhibit 4.17: Average Achievement in Science Cognitive Domains

Country	Overall Science Average Scale Score	Knowing (75 Items)		Applying (80 Items)		Reasoning (56 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>2</sup> Singapore	608 (3.9)	621 (4.2)	13 (1.7) ▲	608 (4.1)	1 (1.6)	595 (4.0)	-13 (0.8) ▽	
Chinese Taipei	574 (1.9)	600 (2.4)	26 (1.5) ▲	567 (2.1)	-8 (1.2) ▽	559 (2.1)	-16 (1.0) ▽	
Japan	570 (2.1)	563 (2.4)	-7 (1.4) ▽	576 (2.3)	6 (0.8) ▲	570 (2.5)	1 (1.2)	
Korea, Rep. of	561 (2.1)	558 (2.6)	-3 (1.5)	560 (2.4)	-1 (1.9)	564 (2.3)	3 (1.7) ▲	
<sup>2</sup> Russian Federation	543 (4.2)	543 (4.7)	1 (2.4)	543 (4.5)	0 (1.2)	543 (4.5)	0 (2.9)	
Finland	543 (3.1)	545 (3.2)	2 (1.4)	537 (3.3)	-6 (1.1) ▽	548 (3.4)	5 (1.4) ▲	
Lithuania	534 (3.0)	527 (3.1)	-6 (1.3) ▽	530 (3.0)	-4 (1.3) ▽	541 (3.2)	7 (1.5) ▲	
Hungary	530 (2.6)	537 (3.0)	8 (1.4) ▲	528 (3.1)	-2 (1.8)	524 (3.1)	-5 (1.4) ▽	
Australia	528 (3.2)	515 (3.5)	-14 (1.4) ▽	532 (3.4)	4 (0.9) ▲	536 (3.1)	7 (1.0) ▲	
Ireland	523 (2.9)	513 (3.0)	-10 (1.7) ▽	521 (3.4)	-2 (1.8)	534 (3.4)	11 (1.6) ▲	
<sup>†</sup> United States	522 (4.7)	515 (4.6)	-8 (1.1) ▽	523 (4.8)	1 (0.9)	528 (4.7)	6 (1.4) ▲	
<sup>2</sup> Sweden	521 (3.2)	521 (3.2)	0 (1.1)	518 (3.3)	-3 (1.2) ▽	524 (3.8)	2 (2.3)	
Portugal	519 (2.9)	520 (3.1)	2 (1.7)	514 (3.1)	-4 (1.3) ▽	519 (3.5)	1 (2.2)	
England	517 (4.8)	520 (5.0)	3 (1.5)	515 (5.1)	-2 (1.8)	513 (5.0)	-3 (1.1) ▽	
Turkey	515 (3.7)	506 (4.2)	-9 (1.6) ▽	515 (3.9)	-1 (2.5)	524 (4.0)	8 (2.1) ▲	
<sup>3</sup> Israel	513 (4.2)	514 (4.6)	0 (1.6)	509 (4.3)	-4 (1.5) ▽	518 (4.6)	5 (1.9) ▲	
<sup>†</sup> Hong Kong SAR	504 (5.2)	501 (5.7)	-2 (1.8)	501 (5.2)	-2 (1.4)	504 (5.2)	0 (1.3)	
Italy	500 (2.6)	507 (2.6)	7 (1.5) ▲	499 (3.4)	-2 (1.8)	495 (4.0)	-5 (2.7)	
<sup>†</sup> New Zealand	499 (3.5)	480 (3.6)	-19 (1.6) ▽	503 (3.8)	4 (1.4) ▲	510 (3.5)	11 (1.1) ▲	
<sup>†</sup> Norway (9)	495 (3.1)	497 (2.5)	2 (1.6)	493 (3.5)	-3 (1.3) ▽	494 (3.6)	-1 (1.3)	
France	489 (2.7)	480 (2.9)	-8 (1.7) ▽	482 (2.8)	-7 (1.6) ▽	502 (3.0)	14 (2.2) ▲	
Bahrain	486 (1.9)	493 (2.0)	7 (1.2) ▲	481 (2.6)	-5 (2.0) ▽	482 (2.4)	-4 (1.5) ▽	
Cyprus	484 (1.9)	482 (3.0)	-1 (2.9)	477 (1.9)	-6 (1.1) ▽	488 (2.3)	4 (1.1) ▲	
<sup>2</sup> Kazakhstan	478 (3.1)	463 (3.7)	-15 (1.6) ▽	481 (3.4)	3 (1.5)	482 (3.5)	4 (1.8) ▲	
Qatar	475 (4.4)	487 (4.2)	12 (1.6) ▲	469 (4.5)	-5 (1.3) ▽	464 (4.6)	-11 (1.7) ▽	
United Arab Emirates	473 (2.2)	482 (2.7)	9 (0.9) ▲	472 (2.2)	-1 (0.6)	461 (2.2)	-12 (0.8) ▽	
Romania	470 (4.2)	475 (4.4)	5 (2.6)	467 (4.2)	-3 (1.4) ▽	464 (4.4)	-6 (1.9) ▽	
Chile	462 (2.9)	463 (3.3)	1 (1.7)	462 (3.0)	0 (2.1)	458 (3.1)	-5 (2.0) ▽	
Malaysia	460 (3.5)	442 (3.9)	-18 (1.1) ▽	473 (3.4)	13 (0.9) ▲	459 (3.7)	-2 (1.5)	
Oman	457 (2.9)	461 (3.3)	4 (2.0) ▲	456 (3.4)	-1 (2.2)	450 (3.0)	-7 (1.1) ▽	
Jordan	452 (4.7)	455 (5.3)	3 (1.7)	453 (4.9)	1 (1.4)	443 (4.8)	-9 (1.7) ▽	
Iran, Islamic Rep. of	449 (3.6)	449 (4.1)	-1 (1.6)	452 (3.5)	2 (0.9) ▲	444 (4.4)	-5 (2.3) ▽	
<sup>1</sup> Georgia	447 (3.9)	459 (4.1)	12 (1.7) ▲	440 (3.7)	-7 (2.8) ▽	436 (4.2)	-10 (2.8) ▽	
Kuwait	444 (5.7)	-	-	-	-	-	-	
<sup>2</sup> Saudi Arabia	431 (2.6)	-	-	-	-	-	-	
Morocco	394 (2.7)	380 (3.1)	-14 (1.1) ▽	393 (2.9)	-1 (1.4)	398 (2.8)	4 (1.2) ▲	
<sup>2</sup> Egypt	389 (5.4)	396 (5.9)	7 (1.5) ▲	384 (5.7)	-6 (2.0) ▽	378 (5.7)	-11 (1.7) ▽	
Lebanon	377 (4.6)	388 (4.4)	11 (2.9) ▲	375 (5.2)	-1 (1.9)	346 (5.2)	-31 (3.1) ▽	
<sup>ψ</sup> South Africa (9)	370 (3.1)	361 (3.2)	-9 (1.1) ▽	377 (2.9)	7 (0.7) ▲	362 (3.0)	-8 (0.9) ▽	
<b>Benchmarking Participants</b>								
Moscow City, Russian Fed.	567 (2.9)	570 (3.0)	4 (0.9) ▲	562 (3.7)	-5 (2.4) ▽	568 (3.1)	2 (1.0)	
<sup>2</sup> Dubai, UAE	548 (2.0)	560 (2.3)	13 (1.0) ▲	545 (2.5)	-3 (1.2) ▽	538 (2.3)	-10 (1.6) ▽	
<sup>†</sup> Quebec, Canada	537 (3.6)	529 (3.6)	-8 (2.0) ▽	538 (4.2)	1 (2.2)	540 (4.1)	4 (1.5) ▲	
Ontario, Canada	522 (3.0)	505 (3.3)	-17 (1.1) ▽	523 (3.5)	1 (2.3)	533 (3.7)	11 (3.3) ▲	
Western Cape, RSA (9)	439 (5.1)	427 (6.0)	-12 (2.6) ▽	446 (5.0)	7 (1.5) ▲	438 (5.8)	-1 (4.1)	
Gauteng, RSA (9)	422 (3.9)	413 (4.9)	-9 (2.2) ▽	428 (3.7)	6 (2.3) ▲	417 (3.8)	-5 (1.3) ▽	
Abu Dhabi, UAE	420 (3.6)	422 (4.3)	1 (1.2)	421 (3.5)	0 (1.4)	412 (3.6)	-8 (1.4) ▽	

▲ Subscale score significantly higher than overall science score  
 ▽ Subscale score significantly lower than overall science score

Numbers of items are based on the TIMSS 2019 eighth grade science eAssessment 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 B.7 for target population coverage notes 1, 2, and 3. See Appendix B.10 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.