

Exhibit 3.17: Average Achievement in Mathematics Cognitive Domains

Country	Overall Mathematics Average Scale Score	Knowing (64 Items)		Applying (96 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
<sup>2</sup> Singapore	616 (4.0)	614 (4.3)	-1 (1.4)	614 (3.8)	-2 (0.7) ▽	620 (4.5)	4 (1.0) ▲
Chinese Taipei	612 (2.7)	616 (3.0)	3 (1.5) ▲	610 (2.6)	-3 (1.8)	616 (2.7)	4 (1.9)
Korea, Rep. of	607 (2.8)	614 (3.2)	7 (1.2) ▲	604 (2.7)	-3 (1.2) ▽	609 (3.0)	2 (2.4)
Japan	594 (2.7)	589 (3.1)	-5 (1.2) ▽	596 (2.8)	2 (1.2)	599 (3.2)	5 (1.7) ▲
<sup>†</sup> Hong Kong SAR	578 (4.1)	580 (4.0)	2 (1.6)	575 (4.0)	-3 (1.1) ▽	582 (4.4)	4 (1.9)
<sup>2</sup> Russian Federation	543 (4.5)	550 (5.2)	6 (2.0) ▲	543 (4.5)	-1 (1.0)	536 (4.8)	-7 (1.7) ▽
Ireland	524 (2.6)	530 (2.8)	7 (1.5) ▲	526 (2.7)	3 (0.9) ▲	508 (3.4)	-16 (1.8) ▽
Lithuania	520 (2.9)	518 (2.8)	-2 (1.1)	524 (3.1)	3 (1.2) ▲	514 (3.6)	-7 (1.5) ▽
<sup>3</sup> Israel	519 (4.3)	516 (4.8)	-3 (1.2) ▽	519 (4.2)	0 (0.8)	525 (4.7)	6 (1.9) ▲
Australia	517 (3.8)	511 (4.0)	-7 (1.2) ▽	521 (3.8)	4 (0.7) ▲	515 (3.9)	-3 (0.8) ▽
Hungary	517 (2.9)	516 (3.1)	-1 (1.0)	517 (3.0)	0 (1.1)	512 (3.0)	-4 (1.3) ▽
<sup>†</sup> United States	515 (4.8)	522 (5.2)	6 (1.4) ▲	515 (4.9)	0 (0.8)	507 (4.6)	-8 (1.0) ▽
England	515 (5.3)	510 (5.5)	-5 (2.1) ▽	518 (5.3)	3 (1.1) ▲	512 (5.7)	-3 (1.8)
Finland	509 (2.6)	505 (2.5)	-4 (1.1) ▽	510 (2.7)	2 (0.9)	506 (2.9)	-3 (1.5)
<sup>†</sup> Norway (9)	503 (2.4)	499 (2.3)	-4 (1.6) ▽	504 (2.7)	1 (1.3)	496 (2.8)	-7 (1.9) ▽
<sup>2</sup> Sweden	503 (2.5)	496 (2.6)	-7 (1.6) ▽	501 (2.6)	-1 (1.0)	514 (2.9)	11 (1.3) ▲
Cyprus	501 (1.6)	509 (2.0)	8 (1.6) ▲	496 (1.7)	-5 (1.3) ▽	505 (2.1)	4 (1.3) ▲
Portugal	500 (3.2)	498 (3.5)	-2 (2.0)	497 (3.3)	-4 (1.2) ▽	508 (3.3)	7 (2.2) ▲
Italy	497 (2.7)	492 (2.8)	-5 (2.1) ▽	497 (2.4)	-1 (1.5)	505 (3.6)	7 (1.8) ▲
Turkey	496 (4.3)	494 (5.0)	-1 (1.8)	491 (4.0)	-4 (1.6) ▽	504 (4.1)	8 (1.8) ▲
<sup>2</sup> Kazakhstan	488 (3.3)	488 (3.7)	1 (1.4)	486 (3.2)	-1 (0.8)	487 (3.4)	0 (1.0)
France	483 (2.5)	473 (2.8)	-9 (1.6) ▽	485 (2.6)	2 (1.6)	489 (2.7)	6 (1.5) ▲
<sup>†</sup> New Zealand	482 (3.4)	468 (3.5)	-14 (2.0) ▽	486 (3.1)	5 (1.1) ▲	486 (3.4)	5 (0.9) ▲
Bahrain	481 (1.7)	471 (1.7)	-10 (0.8) ▽	479 (1.7)	-2 (0.9) ▽	489 (2.1)	8 (1.3) ▲
Romania	479 (4.3)	482 (5.0)	3 (2.0)	475 (4.1)	-4 (1.1) ▽	481 (4.5)	2 (1.4)
United Arab Emirates	473 (1.9)	478 (1.9)	5 (0.8) ▲	466 (1.8)	-8 (0.7) ▽	479 (1.9)	6 (0.9) ▲
<sup>1</sup> Georgia	461 (4.3)	--	--	--	--	--	--
Malaysia	461 (3.2)	451 (3.8)	-9 (1.5) ▽	464 (3.1)	3 (0.9) ▲	462 (3.1)	1 (1.1)
Iran, Islamic Rep. of	446 (3.7)	441 (4.2)	-6 (1.1) ▽	443 (3.5)	-4 (1.1) ▽	457 (4.0)	11 (1.6) ▲
<sup>ψ</sup> Qatar	443 (4.0)	443 (4.6)	-1 (1.8)	438 (4.1)	-6 (0.9) ▽	448 (3.8)	4 (1.3) ▲
<sup>ψ</sup> Chile	441 (2.8)	434 (3.0)	-7 (1.3) ▽	438 (2.9)	-3 (1.5)	451 (3.2)	10 (2.0) ▲
Lebanon	429 (2.9)	456 (2.9)	26 (1.5) ▲	412 (3.5)	-18 (1.7) ▽	407 (3.7)	-22 (2.4) ▽
<sup>ψ</sup> Jordan	420 (4.3)	414 (5.0)	-7 (1.8) ▽	415 (4.0)	-5 (1.1) ▽	431 (4.4)	11 (1.5) ▲
<sup>2ψ</sup> Egypt	413 (5.2)	416 (5.8)	3 (1.6)	405 (5.3)	-7 (1.6) ▽	411 (5.6)	-2 (1.4)
<sup>ψ</sup> Oman	411 (2.8)	406 (2.8)	-4 (1.1) ▽	409 (2.5)	-2 (1.0)	412 (2.8)	1 (1.0)
<sup>ψ</sup> Kuwait	403 (5.0)	--	--	--	--	--	--
<sup>2ψ</sup> Saudi Arabia	394 (2.5)	--	--	--	--	--	--
<sup>✳</sup> South Africa (9)	389 (2.3)	--	--	--	--	--	--
<sup>ψ</sup> Morocco	388 (2.3)	382 (2.9)	-6 (1.6) ▽	389 (2.4)	0 (1.3)	381 (2.9)	-7 (2.2) ▽
<b>Benchmarking Participants</b>							
Moscow City, Russian Fed.	575 (4.2)	589 (4.2)	14 (1.6) ▲	574 (4.3)	-1 (1.4)	568 (4.2)	-8 (1.4) ▽
<sup>‡</sup> Quebec, Canada	543 (3.7)	546 (3.8)	2 (1.9)	544 (4.1)	1 (1.5)	538 (3.8)	-5 (1.0) ▽
<sup>2</sup> Dubai, UAE	537 (2.0)	540 (2.2)	3 (1.1) ▲	532 (2.2)	-4 (1.0) ▽	541 (2.1)	5 (1.1) ▲
Ontario, Canada	530 (4.3)	518 (4.2)	-12 (1.9) ▽	531 (4.5)	1 (1.3)	540 (4.6)	11 (2.3) ▲
<sup>ψ</sup> Western Cape, RSA (9)	441 (4.4)	432 (5.9)	-9 (2.3) ▽	442 (4.1)	1 (1.7)	444 (4.8)	3 (2.4)
<sup>ψ</sup> Abu Dhabi, UAE	436 (2.9)	440 (3.2)	5 (1.5) ▲	428 (2.9)	-8 (1.3) ▽	441 (2.8)	6 (0.8) ▲
<sup>ψ</sup> Gauteng, RSA (9)	421 (3.0)	411 (3.6)	-9 (1.2) ▽	423 (3.3)	2 (2.1)	427 (3.4)	6 (2.5) ▲

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

Numbers of items are based on the TIMSS 2019 eighth grade mathematics 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.