

Exhibit 4.16: Average Achievement in Science Content Domains by Gender

Country	Biology (75 Items)		Chemistry (42 Items)		Physics (52 Items)		Earth Science (42 Items)	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Australia	533 (3.2)	529 (4.8)	519 (3.5)	510 (5.3)	524 (3.6)	533 (5.0)	531 (3.3)	536 (4.6)
Bahrain	522 (2.8) ▲	464 (2.7)	514 (3.0) ▲	448 (3.5)	500 (3.8) ▲	461 (2.8)	499 (3.2) ▲	453 (3.7)
Chile	468 (3.6)	475 (4.0)	440 (3.7)	443 (3.8)	442 (3.6)	458 (5.3) ▲	451 (4.6)	476 (4.8) ▲
Chinese Taipei	577 (3.1)	575 (2.7)	598 (3.3)	591 (3.1)	550 (3.3)	560 (3.3) ▲	572 (3.4)	586 (2.8) ▲
Cyprus	500 (3.3) ▲	479 (2.8)	491 (2.7) ▲	466 (3.3)	482 (4.9)	477 (3.7)	473 (3.4)	473 (3.1)
² Egypt	393 (6.3) ▲	366 (8.7)	415 (6.2) ▲	376 (9.1)	405 (5.8) ▲	380 (7.8)	375 (6.4)	357 (8.6)
England	518 (5.9)	513 (6.7)	521 (7.5)	502 (7.9)	517 (5.9)	515 (7.2)	513 (6.8)	523 (7.0)
Finland	549 (3.4) ▲	520 (4.1)	561 (4.0) ▲	530 (4.4)	542 (4.0)	537 (5.1)	562 (4.4)	555 (4.0)
France	488 (2.8)	488 (3.8)	467 (3.7)	463 (4.8)	486 (3.5)	495 (4.6) ▲	495 (5.9)	510 (4.5) ▲
¹ Georgia	451 (3.8)	444 (4.2)	462 (4.7)	451 (5.8)	431 (6.0)	441 (5.4)	425 (4.0)	436 (4.7) ▲
[†] Hong Kong SAR	502 (6.3)	499 (6.8)	492 (6.1)	479 (7.5)	511 (6.1)	509 (7.1)	506 (6.8)	516 (6.7)
Hungary	523 (3.3)	537 (3.2) ▲	521 (3.9)	534 (4.4) ▲	514 (3.4)	542 (3.5) ▲	517 (4.2)	552 (4.6) ▲
Iran, Islamic Rep. of	459 (4.4) ▲	438 (5.8)	467 (5.5) ▲	435 (6.8)	460 (5.2)	448 (6.0)	438 (5.7)	436 (6.0)
Ireland	523 (3.2)	520 (4.4)	525 (4.6) ▲	500 (5.0)	517 (4.1)	520 (4.7)	536 (4.5)	536 (4.2)
³ Israel	511 (4.5)	513 (5.4)	527 (5.0) ▲	510 (5.6)	514 (5.3)	526 (5.9) ▲	487 (6.1)	503 (5.4) ▲
Italy	506 (3.2)	510 (3.2)	484 (3.4)	483 (3.4)	483 (4.8)	491 (4.8) ▲	503 (4.1)	521 (4.8) ▲
Japan	571 (2.2)	577 (3.2) ▲	560 (2.5)	560 (3.6)	563 (2.8)	578 (3.4) ▲	563 (3.5)	581 (4.9) ▲
Jordan	488 (4.4) ▲	429 (7.1)	488 (4.4) ▲	423 (7.5)	471 (4.3) ▲	429 (6.8)	450 (4.6) ▲	407 (6.7)
² Kazakhstan	482 (3.7) ▲	471 (3.7)	501 (4.0) ▲	487 (4.3)	479 (4.4)	472 (4.4)	449 (5.6)	447 (4.7)
Korea, Rep. of	554 (3.0)	565 (2.8) ▲	553 (4.0)	549 (3.7)	563 (3.7)	575 (3.2) ▲	549 (4.3)	574 (3.7) ▲
Kuwait	- -	- -	- -	- -	- -	- -	- -	- -
Lebanon	362 (6.2) ▲	348 (5.3)	420 (4.9) ▲	405 (5.9)	375 (6.0)	380 (5.4)	337 (6.2)	337 (5.9)
Lithuania	540 (3.1) ▲	529 (3.7)	536 (3.2) ▲	524 (3.9)	523 (2.9)	534 (4.6) ▲	530 (3.2)	539 (4.2) ▲
Malaysia	468 (3.9) ▲	457 (4.4)	440 (4.6) ▲	428 (5.1)	475 (4.1)	475 (4.4)	449 (4.7)	454 (4.9)
Morocco	387 (3.5)	386 (3.8)	408 (3.4) ▲	396 (3.6)	403 (3.0)	401 (3.3)	352 (4.1)	362 (4.1)
[†] New Zealand	500 (3.7)	496 (5.0)	483 (3.8)	481 (6.1)	496 (3.9)	507 (5.4) ▲	502 (3.5)	517 (5.4) ▲
[†] Norway (9)	489 (3.1)	482 (3.8)	499 (4.8) ▲	486 (4.7)	486 (3.5)	500 (4.6) ▲	513 (5.1)	525 (4.1) ▲
Oman	497 (3.6) ▲	437 (4.8)	480 (3.3) ▲	409 (4.9)	473 (3.6) ▲	427 (5.3)	472 (4.2) ▲	427 (5.4)
Portugal	524 (3.7)	530 (3.7)	514 (3.5)	511 (4.9)	493 (4.0)	500 (4.2)	523 (5.1)	539 (4.0) ▲
Qatar	491 (5.3) ▲	462 (6.4)	497 (5.8) ▲	452 (6.5)	480 (5.6) ▲	459 (5.7)	472 (5.7)	458 (7.2)
Romania	486 (5.0) ▲	472 (4.8)	476 (5.3) ▲	457 (5.8)	460 (4.6)	455 (4.9)	452 (4.6)	455 (5.8)
² Russian Federation	545 (4.7)	542 (4.9)	550 (4.6)	552 (4.6)	532 (5.0)	549 (5.1) ▲	522 (5.0)	543 (5.0) ▲
² Saudi Arabia	- -	- -	- -	- -	- -	- -	- -	- -
² Singapore	621 (4.7)	623 (5.2)	617 (5.8)	614 (5.7)	614 (5.0)	624 (4.8) ▲	551 (5.4)	572 (4.3) ▲
^ψ South Africa (9)	366 (3.2) ▲	352 (3.4)	383 (4.2) ▲	359 (4.9)	383 (3.3)	379 (3.6)	370 (3.6)	362 (4.2)
² Sweden	523 (3.9)	515 (4.1)	521 (4.4) ▲	497 (4.4)	524 (4.5)	516 (4.5)	533 (4.3)	528 (4.1)
Turkey	519 (3.9) ▲	507 (4.8)	530 (4.7) ▲	501 (6.7)	519 (4.3)	517 (5.7)	508 (4.3)	510 (5.4)
United Arab Emirates	489 (4.1) ▲	461 (4.3)	494 (4.1) ▲	458 (4.4)	479 (3.8) ▲	460 (3.9)	474 (4.0) ▲	458 (4.1)
[†] United States	536 (4.0) ▲	524 (6.2)	515 (4.6)	503 (7.0)	514 (4.2)	515 (6.6)	527 (4.5)	532 (6.8)
International Average	499 (0.7) ▲	487 (0.8)	499 (0.7) ▲	480 (0.9)	491 (0.7)	490 (0.8)	486 (0.8)	489 (0.8) ▲
Benchmarking Participants								
Ontario, Canada	536 (3.4)	533 (3.8)	493 (4.3)	490 (4.4)	516 (4.4)	523 (3.7)	513 (4.7)	527 (4.3) ▲
[‡] Quebec, Canada	533 (4.6)	528 (4.1)	553 (4.6)	544 (4.7)	517 (5.1)	525 (4.7)	549 (5.0)	556 (5.1)
Moscow City, Russian Fed.	564 (3.8)	567 (3.5)	561 (3.7)	562 (4.2)	565 (4.3)	586 (4.7) ▲	550 (4.3)	578 (4.4) ▲
Gauteng, RSA (9)	421 (4.4) ▲	409 (4.4)	433 (4.8) ▲	410 (4.7)	429 (4.8)	426 (4.9)	422 (4.7)	414 (5.2)
Western Cape, RSA (9)	427 (6.1)	438 (6.6)	441 (7.2)	443 (9.4)	434 (7.0)	451 (7.2) ▲	435 (7.3)	450 (8.1) ▲
Abu Dhabi, UAE	434 (7.5) ▲	401 (6.0)	443 (7.0) ▲	401 (6.2)	433 (6.6) ▲	409 (5.6)	423 (7.1)	403 (6.3)
² Dubai, UAE	558 (5.5)	549 (7.0)	563 (5.8)	545 (7.2)	541 (5.6)	538 (6.7)	537 (5.4)	540 (6.7)

▲ Average significantly higher than other gender

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.

