

**Exhibit 3.6: Differences in Achievement for Science Content Domains Across Assessment Years**

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Biology Average Scale Score	Biology		Chemistry Average Scale Score	Chemistry		Physics Average Scale Score	Physics		Earth Science Average Scale Score	Earth Science	
		Differences Between Years			Differences Between Years			Differences Between Years			Differences Between Years	
		2011	2007		2011	2007		2011	2007		2011	2007
<b>Australia</b>												
2015	522 (2.8)	-5	3	493 (3.3)	-8	-12 ▼	505 (2.7)	-6	-4	522 (2.9)	-11	1
2011	527 (4.8)		8	501 (5.0)		-3	511 (5.1)		2	533 (5.5)		13
2007	519 (3.8)			504 (4.0)			509 (4.3)			521 (4.4)		
<b>Bahrain</b>												
2015	469 (2.6)	20 ▲	-1	462 (2.8)	15 ▲	-4	461 (2.6)	5	-2	461 (3.5)	9 ▲	0
2011	449 (2.0)		-22 ▼	448 (2.6)		-19 ▼	457 (1.7)		-7 ▼	451 (1.8)		-9 ▼
2007	470 (2.1)			467 (2.9)			463 (1.6)			460 (2.8)		
<b>Botswana (9)</b>												
2015	397 (2.9)	-4		390 (3.6)	-13 ▼		384 (2.8)	-33 ▼		368 (3.1)	-16 ▼	
2011	401 (3.8)			403 (3.5)			417 (3.5)			384 (4.3)		
<b>Chile</b>												
2015	459 (3.6)	-3		438 (3.6)	-9		439 (3.8)	-14 ▼		464 (3.2)	-12 ▼	
2011	462 (2.6)			447 (3.0)			453 (2.6)			476 (2.8)		
<b>Chinese Taipei</b>												
2015	565 (2.2)	8 ▲	11 ▲	579 (2.7)	-7	-6	560 (3.0)	8	1	581 (2.7)	12 ▲	29 ▲
2011	557 (2.5)		3	585 (3.8)		1	552 (3.3)		-6	568 (2.8)		16 ▲
2007	554 (3.7)			585 (4.7)			559 (4.2)			552 (3.4)		
<b>Egypt</b>												
2015	348 (5.0)		-52 ▼	395 (5.0)		-9	378 (4.7)		-28 ▼	351 (4.6)		-65 ▼
2007	400 (3.7)			404 (4.7)			406 (3.8)			417 (4.4)		
<b>England</b>												
2015	542 (4.0)	9	-2	529 (4.5)	0	-11	535 (3.9)	2	-14 ▼	536 (4.0)	-1	4
2011	533 (4.8)		-11	529 (5.2)		-11	533 (4.7)		-15 ▼	536 (5.3)		5
2007	544 (4.7)			539 (4.7)			549 (4.5)			531 (5.2)		
<b>Georgia</b>												
2015	447 (3.1)	12 ▲	28 ▲	456 (3.7)	61 ▲	48 ▲	429 (4.6)	28 ▲	19 ▲	420 (3.6)	2	4
2011	435 (3.2)		16 ▲	395 (3.2)		-13 ▼	401 (4.2)		-9	417 (3.5)		2
2007	419 (4.1)			408 (5.4)			411 (5.9)			416 (4.5)		
<b>Hong Kong SAR</b>												
2015	549 (4.7)	13 ▲	19 ▲	536 (4.1)	10	15 ▲	540 (4.1)	2	10	558 (4.3)	19 ▲	23 ▲
2011	535 (3.6)		6	526 (3.6)		5	539 (3.6)		9	539 (3.6)		4
2007	529 (5.0)			521 (5.3)			530 (5.4)			535 (5.1)		
<b>Hungary</b>												
2015	521 (3.3)	1	-14 ▼	534 (3.6)	0	-6	531 (4.0)	6	-13 ▼	521 (3.9)	10 ▲	-13 ▼
2011	520 (3.0)		-15 ▼	534 (3.3)		-6	525 (3.7)		-19 ▼	511 (3.3)		-24 ▼
2007	535 (2.9)			540 (4.0)			544 (3.7)			535 (3.3)		
<b>Iran, Islamic Rep. of</b>												
2015	448 (3.8)	-18 ▼	3	458 (4.6)	-12	1	475 (4.4)	-8	8	439 (4.5)	-38 ▼	-33 ▼
2011	466 (3.9)		21 ▲	469 (4.4)		12 ▲	483 (4.1)		16 ▲	477 (4.0)		5
2007	445 (3.7)			457 (4.1)			467 (4.1)			472 (4.3)		
<b>Israel</b>												
2015	504 (4.2)	-19 ▼		516 (4.6)	2		508 (4.0)	-5		493 (4.0)	-12 ▼	
2011	523 (4.2)			514 (5.0)			514 (4.1)			504 (4.3)		
<b>Italy</b>												
2015	496 (2.6)	-8 ▼	-6	487 (2.4)	-4	9 ▲	496 (2.5)	6	8	514 (2.8)	1	12 ▲
2011	503 (3.0)		1	491 (3.0)		13 ▲	490 (2.8)		2	513 (3.8)		11 ▲
2007	502 (3.2)			478 (3.5)			489 (3.5)			502 (3.5)		
<b>Japan</b>												
2015	570 (2.9)	10 ▲	16 ▲	570 (2.4)	10 ▲	11 ▲	570 (2.3)	12 ▲	6 ▲	574 (2.0)	26 ▲	38 ▲
2011	561 (2.3)		6 ▲	560 (2.7)		1	558 (2.8)		-5	548 (2.8)		12 ▲
2007	554 (2.0)			559 (2.4)			563 (2.2)			536 (3.4)		

▲ More recent year significantly higher  
▼ More recent year significantly lower

Trend results for Kuwait do not include private schools. Trend results for Lithuania do not include students taught in Polish or in Russian. South Africa (9) tested one year later.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%. Such annotations in exhibits with trend data began in 2011, so data from assessments prior to 2011 are not annotated for reservations.

See Appendix C.2 for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes †, ‡, and §.

•• Tested the same cohort of students as other countries, but later in the assessment year at the beginning of the next school year.

( ) 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

**Exhibit 3.6: Differences in Achievement for Science Content Domains Across Assessment Years (Continued)**

Instructions: Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Biology Average Scale Score	Biology		Chemistry Average Scale Score	Chemistry		Physics Average Scale Score	Physics		Earth Science Average Scale Score	Earth Science	
		Differences Between Years			Differences Between Years			Differences Between Years			Differences Between Years	
		2011	2007		2011	2007		2011	2007		2011	2007
<b>Jordan</b>												
2015	420 (3.9)	-28 ▼	-57 ▼	438 (3.8)	-25 ▼	-55 ▼	424 (3.6)	-22 ▼	-53 ▼	416 (3.0)	-20 ▼	-66 ▼
2011	447 (4.4)		-29 ▼	463 (4.4)		-30 ▼	446 (4.2)		-31 ▼	436 (4.3)		-46 ▼
2007	476 (4.2)			493 (4.7)			478 (4.3)			481 (4.2)		
<b>Kazakhstan</b>												
2015	520 (4.6)	37 ▲		554 (5.2)	45 ▲		543 (5.0)	54 ▲		508 (5.4)	36 ▲	
2011	483 (4.4)			508 (4.7)			489 (4.3)			472 (4.8)		
<b>Korea, Rep. of</b>												
2015	554 (2.2)	-7 ▼	2	550 (2.5)	-1	11 ▲	564 (2.8)	-12 ▼	-12 ▼	554 (2.7)	7	12 ▲
2011	561 (2.3)		9 ▲	551 (2.1)		12 ▲	577 (2.7)		0	548 (3.2)		5
2007	552 (2.0)			539 (3.0)			576 (2.6)			543 (2.4)		
<b>Kuwait</b>												
2015	384 (5.3)		-31 ▼	395 (5.9)		-16 ▼	397 (4.7)		-35 ▼	389 (4.9)		-12 ▼
2007	415 (2.7)			411 (4.2)			432 (3.3)			401 (3.7)		
<b>Lebanon</b>												
2015	366 (6.2)	-29 ▼	-33 ▼	438 (6.2)	3	-2	412 (6.6)	7	-12	365 (6.4)	1	-13
2011	395 (5.2)		-4	435 (5.2)		-5	405 (5.4)		-19 ▼	365 (6.4)		-14
2007	399 (6.7)			440 (6.5)			424 (5.7)			378 (6.8)		
<b>Lithuania</b>												
<sup>2</sup> 2015	524 (3.4)	8	-5	519 (3.2)	2	13 ▲	514 (3.7)	11 ▲	7	521 (3.4)	5	4
<sup>1</sup> 2011	517 (2.7)		-13 ▼	517 (2.3)		11 ▲	503 (3.2)		-4	517 (3.5)		0
<sup>1</sup> 2007	530 (2.7)			506 (2.6)			507 (3.1)			517 (3.0)		
<b>Malaysia</b>												
2015	466 (4.4)	39 ▲	1	473 (4.0)	47 ▲	-2	480 (3.9)	45 ▲	-2	460 (4.5)	59 ▲	4
2011	427 (6.2)		-39 ▼	426 (6.5)		-49 ▼	435 (6.6)		-47 ▼	401 (6.5)		-56 ▼
2007	466 (6.2)			475 (5.9)			482 (6.4)			457 (6.1)		
<b>Malta</b>												
2015	473 (2.7)		23 ▲	481 (2.1)		26 ▲	490 (1.8)		23 ▲	481 (2.5)		31 ▲
2007	449 (1.9)			456 (2.2)			467 (2.1)			450 (1.7)		
<b>Morocco</b>												
2015	380 (2.5)	2		400 (3.0)	25 ▲		395 (2.9)	47 ▲		395 (2.2)	18 ▲	
2011	378 (3.1)			374 (2.3)			349 (2.6)			377 (3.3)		
<b>New Zealand</b>												
<sup>†</sup> 2015	520 (3.5)	5		498 (3.5)	-3		508 (3.2)	0		517 (3.6)	-6	
2011	514 (4.8)			501 (5.3)			509 (4.6)			523 (4.8)		
<b>Norway (8)</b>												
2015	486 (2.9)	-6	1	479 (3.5)	-9	-1	483 (2.6)	2	10 ▲	506 (3.2)	-10 ▼	4
2011	491 (2.3)		6	488 (2.8)		8	481 (3.4)		8	516 (3.3)		14 ▲
2007	485 (2.7)			480 (2.9)			474 (3.4)			502 (2.7)		
<b>Oman</b>												
2015	454 (2.7)	47 ▲	47 ▲	452 (2.7)	44 ▲	44 ▲	449 (3.0)	22 ▲	10 ▲	456 (2.4)	25 ▲	24 ▲
2011	407 (3.5)		0	408 (3.5)		0	427 (3.3)		-12 ▼	431 (3.0)		-1
2007	408 (3.2)			408 (4.4)			439 (3.1)			432 (2.9)		

▲ More recent year significantly higher  
▼ More recent year significantly lower

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		Differences Between Years			Differences Between Years			Differences Between Years			Differences Between Years	
		2011	2007		2011	2007		2011	2007		2011	2007
<b>Qatar</b>												
2015	454 (3.0)	43 ▲		455 (3.6)	39 ▲		459 (3.4)	33 ▲		446 (3.7)	38 ▲	
2011	411 (4.2)			416 (4.0)			426 (3.8)			408 (3.8)		
<b>Russian Federation</b>												
2015	539 (4.4)	2	12 ▲	558 (4.9)	4	18 ▲	548 (4.2)	1	27 ▲	532 (4.7)	-3	4
<sup>2</sup> 2011	537 (3.3)		10	554 (3.5)		13 ▲	547 (3.6)		26 ▲	535 (3.6)		7
2007	527 (3.9)			540 (4.2)			521 (4.3)			528 (4.2)		
<b>Saudi Arabia</b>												
2015	397 (5.1)	-32 ▼		377 (5.0)	-50 ▼		385 (5.3)	-52 ▼		403 (4.3)	-38 ▼	
2011	430 (4.5)			428 (4.6)			437 (4.2)			441 (3.6)		
<b>Singapore</b>												
<sup>2</sup> 2015	609 (3.5)	15 ▲	42 ▲	593 (3.6)	3	27 ▲	608 (3.1)	7	26 ▲	565 (3.6)	-1	17 ▲
<sup>2</sup> 2011	594 (4.8)		27 ▲	590 (4.7)		24 ▲	602 (4.2)		19 ▲	566 (4.5)		19 ▲
2007	567 (4.5)			566 (4.8)			582 (4.3)			547 (4.9)		
<b>Slovenia</b>												
2015	548 (2.8)	16 ▲	17 ▲	552 (2.6)	-5	6	545 (2.9)	13 ▲	18 ▲	564 (2.9)	4	17 ▲
2011	532 (2.7)		0	558 (3.2)		11 ▲	532 (2.8)		4	560 (3.2)		13 ▲
2007	532 (2.5)			546 (3.0)			528 (2.4)			548 (2.6)		
<b>South Africa (9)</b>												
2015	356 (5.9)	38 ▲		369 (6.1)	33 ▲		359 (5.5)	8		330 (6.4)	36 ▲	
<sup>ψ</sup> 2011	318 (3.5)			336 (3.8)			351 (3.6)			294 (3.7)		
<b>Sweden</b>												
2015	520 (3.6)	7	5	512 (3.6)	10 ▲	13 ▲	524 (3.7)	26 ▲	17 ▲	532 (4.5)	12 ▲	20 ▲
2011	513 (2.9)		-3	502 (2.6)		3	498 (3.2)		-9 ▼	520 (2.7)		8
2007	515 (2.6)			499 (2.8)			507 (3.0)			511 (3.3)		
<b>Thailand</b>												
2015	466 (4.1)	6	-10	445 (4.9)	9	-10	437 (4.6)	7	-17 ▼	459 (4.5)	-7	-26 ▼
2011	460 (4.2)		-16 ▼	436 (4.5)		-19 ▼	430 (4.4)		-25 ▼	466 (4.0)		-20 ▼
2007	476 (4.5)			455 (4.7)			454 (4.5)			485 (4.3)		
<b>Turkey</b>												
2015	491 (4.1)	7		493 (4.7)	16 ▲		506 (4.2)	12 ▲		477 (3.9)	9	
2011	484 (3.7)			477 (4.0)			494 (3.6)			468 (3.4)		
<b>United Arab Emirates</b>												
2015	475 (2.4)	12 ▲		481 (3.2)	17 ▲		475 (2.5)	13 ▲		475 (2.4)	8 ▲	
2011	463 (2.4)			464 (2.3)			461 (2.3)			466 (2.5)		
<b>United States</b>												
<sup>†</sup> 2015	540 (2.9)	10 ▲	10 ▲	519 (3.2)	-1	9 ▲	516 (2.9)	3	13 ▲	535 (3.1)	2	9
<sup>2</sup> 2011	530 (2.5)		0	520 (2.6)		10 ▲	513 (2.5)		10 ▲	533 (2.7)		7
<sup>2 †</sup> 2007	531 (3.0)			510 (3.1)			503 (3.0)			526 (3.7)		
<b>Benchmarking Participants</b>												
<b>Ontario, Canada</b>												
2015	538 (2.9)	7	0	503 (2.7)	8 ▲	-1	521 (2.9)	0	-1	526 (3.2)	-2	-7
<sup>2</sup> 2011	531 (2.6)		-6	495 (2.4)		-9 ▼	521 (2.8)		-1	528 (3.4)		-5
<sup>2</sup> 2007	537 (4.1)			504 (4.1)			523 (4.6)			533 (4.8)		
<b>Quebec, Canada</b>												
<sup>‡</sup> 2015	527 (4.3)	2	15 ▲	531 (4.6)	15 ▲	35 ▲	520 (4.7)	18 ▲	28 ▲	542 (4.2)	7	28 ▲
2011	525 (2.8)		12 ▲	515 (3.0)		20 ▲	502 (3.1)		10 ▲	536 (2.9)		21 ▲
<sup>3</sup> 2007	512 (3.2)			495 (3.4)			492 (3.5)			514 (4.3)		
<b>Abu Dhabi, UAE</b>												
2015	452 (6.1)	-7		459 (6.7)	-2		454 (5.4)	-5		453 (5.8)	-8	
2011	459 (4.2)			461 (4.1)			459 (3.9)			461 (4.6)		
<b>Dubai, UAE</b>												
2015	525 (2.4)	40 ▲	42 ▲	528 (2.5)	41 ▲	36 ▲	525 (2.4)	43 ▲	36 ▲	518 (2.3)	31 ▲	30 ▲
2011	485 (2.7)		2	487 (2.4)		-5	482 (2.1)		-7	487 (3.1)		-1
<sup>♦ ‡</sup> 2007	483 (3.3)			492 (3.9)			489 (3.5)			488 (3.7)		
<b>Florida, US</b>												
<sup>1</sup> 2015	518 (5.8)	-11		498 (6.9)	-27 ▼		498 (5.8)	-32 ▼		505 (6.7)	-31 ▼	
<sup>1 2</sup> 2011	529 (7.6)			525 (8.0)			530 (7.5)			536 (8.0)		

▲ More recent year significantly higher  
▼ More recent year significantly lower

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