

Students' Attitudes

Students Like Learning Mathematics and Science

Exhibit 11.1 presents the *Students Like Learning Mathematics* scale administered to fourth and eighth grade students. In TIMSS 2019, the scale had nine items covering students' attitudes toward mathematics and studying mathematics (see Mathematics—About the Scale). In each TIMSS cycle since 1995, there has been a positive relationship between students liking mathematics and higher mathematics achievement. Since the inception of an item response theory (IRT) scale in 2011 to measure attitudes more broadly and reliably, the *Students Like Learning Mathematics* scale has had a very strong relationship with achievement in mathematics, and TIMSS 2019 was no exception. At both fourth and eighth grades, students who reported they “very much” like learning mathematics had substantially higher average achievement than students who reported they “do not like” learning mathematics.

Exhibit 11.2 presents the results for fourth grade according to the percentage of students who reported they like to learn mathematics “very much” (from highest to lowest). In general, fourth grade students were positive about learning mathematics—45 percent, on average, responded they like it “very much,” and another 35 percent reported that they “somewhat” like it. However, even at the fourth grade, 20 percent, on average, responded negatively that they “do not like” learning mathematics.

Exhibit 11.3 shows that at the eighth grade, the percentage of students responding negatively increased substantially. At the eighth grade, only 20 percent responded that they like learning mathematics “very much.” Thirty-nine percent responded “somewhat,” and 41 percent (double compared with fourth grade) responded that they “do not like” learning mathematics. The difference in average achievement between eighth grade students who like learning mathematics “very much” and those who “do not like” learning mathematics was 62 scale score points.

Exhibit 11.4 presents the *Students Like Learning Science* scale (parallel to the mathematics scale) which was administered to fourth and eighth grade students (see Science—About the Scale). At both grades, the *Students Like Learning Science* scale was related to higher average achievement in science.

Exhibit 11.5 shows the science scale results at fourth grade. Compared with mathematics, a greater percentage of fourth grade students were positive about learning science, with 52 percent responding that they like it “very much,” and another 36 percent that they “somewhat” like it. A smaller percentage were negative about learning science—12 percent reported they “do not like” it.

Exhibit 11.6 contains the eighth grade results for the *Students Like Learning Science* scale. The first panel is for the 26 countries that taught science as an integrated subject, then there are separate panels for the countries with courses for biology, chemistry, physics, and Earth science. The eighth grade students generally were positive about their integrated science courses, with 35 percent of students

responding that they like to learn science “very much,” another 44 percent liking it “somewhat,” and only 20 percent of students in the “do not like” category. Similar to the relationship with mathematics achievement, the difference in average science achievement between eighth grade students who like learning science “very much” and those who “do not like” learning science was 64 scale score points.

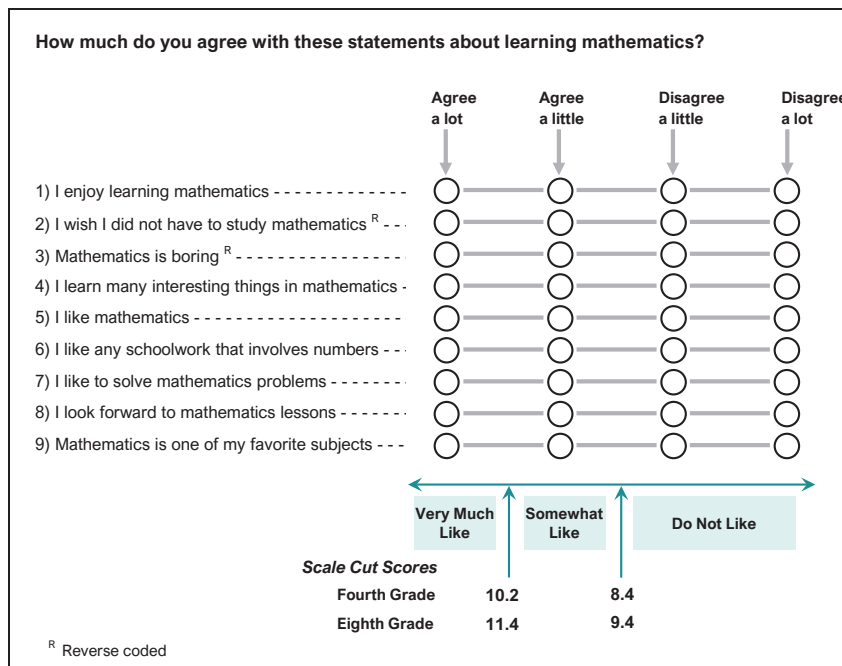
In countries where science is taught as separate subjects, students were positive about learning biology, with only 22 percent of students in the “do not like” learning biology category. Students were less positive about their separate courses in chemistry, physics, and Earth science, with 28 percent, 31 percent, and 26 percent of students in the “do not like” category of the three respective subjects, but not as negative as they were about eighth grade mathematics. The difference in average achievement between eighth grade students in the “very much like” and “do not like” categories was smaller for students taking separate subject courses and varied across the four subjects—30 points for biology, 45 points for chemistry, 46 points for physics, and 22 points for Earth science.

Exhibit 11.1: Students Like Learning Mathematics

Students' Reports

About the Scale

Students were scored according to their responses to nine statements on the *Students Like Learning Mathematics* scale. Cut scores divide the scale into three categories. Students who **Very Much Like Learning Mathematics** had a score at or above the cut score corresponding to “agreeing a lot” with five of the nine statements and “agreeing a little” with the other four, on average. Students who **Do Not Like Learning Mathematics** had a score at or below the cut score corresponding to “disagreeing a little” with five of the nine statements and “agreeing a little” with the other four, on average. All other students **Somewhat Like Learning Mathematics**.



SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
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Exhibit 11.2: Students Like Learning Mathematics
Students' Reports

Country	Very Much Like Learning Mathematics		Somewhat Like Learning Mathematics		Do Not Like Learning Mathematics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	83 (1.2)	504 (3.2)	15 (1.0)	455 (7.6)	2 (0.4)	~ ~	11.8 (0.05)
Kosovo	78 (0.9)	459 (2.7)	20 (0.8)	404 (4.7)	2 (0.3)	~ ~	11.4 (0.04)
Georgia	74 (1.5)	489 (3.7)	22 (1.1)	459 (6.6)	4 (0.6)	446 (11.3)	11.4 (0.06)
Armenia	72 (1.1)	511 (2.6)	23 (1.0)	481 (4.0)	5 (0.4)	465 (5.6)	11.4 (0.05)
Morocco	70 (1.2)	402 (4.1)	25 (1.1)	344 (6.4)	5 (0.4)	326 (10.2)	11.3 (0.05)
Azerbaijan	68 (1.2)	536 (2.3)	27 (1.1)	495 (3.6)	5 (0.4)	477 (7.5)	10.9 (0.05)
Kazakhstan	68 (1.0)	518 (2.6)	28 (1.0)	504 (3.6)	5 (0.5)	494 (6.3)	11.1 (0.05)
Turkey (5)	66 (1.2)	540 (4.1)	25 (0.9)	491 (6.1)	9 (0.6)	495 (7.0)	10.9 (0.05)
North Macedonia	66 (1.3)	495 (5.3)	29 (1.1)	436 (6.8)	5 (0.6)	448 (12.0)	11.0 (0.06)
Montenegro	64 (1.0)	467 (1.9)	25 (0.8)	433 (3.5)	10 (0.6)	427 (5.0)	10.9 (0.04)
Oman	59 (1.2)	455 (4.5)	34 (1.1)	401 (4.7)	7 (0.5)	394 (5.7)	10.8 (0.05)
Iran, Islamic Rep. of	59 (1.4)	457 (3.6)	30 (0.9)	421 (5.2)	11 (0.7)	437 (7.3)	10.8 (0.06)
Saudi Arabia	59 (1.2)	424 (3.6)	30 (1.0)	371 (4.1)	11 (0.8)	370 (8.7)	10.8 (0.05)
Cyprus	56 (1.5)	547 (2.8)	28 (0.9)	522 (3.9)	16 (1.1)	497 (4.9)	10.5 (0.07)
Bahrain	56 (1.4)	494 (2.6)	31 (0.9)	465 (3.2)	13 (0.8)	458 (4.4)	10.6 (0.07)
Bulgaria	54 (1.5)	526 (3.9)	30 (1.1)	508 (5.4)	17 (1.3)	496 (10.1)	10.4 (0.08)
United Arab Emirates	54 (0.7)	503 (1.8)	33 (0.5)	461 (2.3)	13 (0.4)	455 (2.8)	10.5 (0.03)
Portugal	49 (1.3)	542 (2.9)	36 (1.0)	513 (3.1)	15 (0.9)	499 (4.4)	10.3 (0.05)
France	49 (1.0)	499 (3.6)	36 (0.9)	479 (3.9)	15 (0.8)	454 (4.8)	10.2 (0.04)
Bosnia and Herzegovina	49 (1.0)	466 (2.8)	32 (0.6)	443 (3.3)	20 (1.0)	437 (3.4)	10.1 (0.06)
Malta	48 (0.7)	522 (1.7)	34 (0.7)	502 (2.2)	18 (0.7)	488 (3.2)	10.1 (0.03)
Lithuania	47 (1.3)	553 (3.2)	39 (0.9)	538 (3.3)	14 (0.9)	521 (5.7)	10.1 (0.05)
Kuwait	46 (1.6)	416 (6.0)	37 (1.1)	372 (5.5)	17 (1.1)	352 (5.4)	10.2 (0.08)
South Africa (5)	46 (1.5)	415 (3.3)	43 (1.1)	345 (3.7)	12 (0.6)	334 (5.4)	10.3 (0.05)
Italy	45 (1.3)	525 (2.9)	34 (1.1)	511 (3.2)	20 (1.1)	502 (3.5)	10.0 (0.06)
England	44 (1.6)	576 (4.4)	34 (1.1)	549 (4.4)	23 (1.1)	530 (3.8)	9.9 (0.07)
Qatar	43 (1.4)	474 (3.8)	38 (0.9)	434 (4.8)	20 (0.9)	436 (4.9)	10.0 (0.07)
Chile	43 (1.2)	458 (3.2)	39 (0.9)	437 (3.4)	19 (1.0)	418 (4.1)	10.0 (0.05)
Russian Federation	42 (1.1)	579 (4.0)	41 (0.8)	563 (3.5)	17 (0.9)	547 (4.3)	10.0 (0.05)
Austria	40 (1.0)	552 (2.5)	34 (0.8)	538 (2.7)	25 (0.9)	522 (2.9)	9.8 (0.05)
New Zealand	40 (0.9)	503 (3.2)	35 (0.8)	485 (3.6)	25 (0.9)	469 (3.3)	9.8 (0.04)
Australia	40 (1.0)	536 (3.6)	34 (0.9)	516 (3.4)	26 (1.2)	487 (3.6)	9.7 (0.05)
Hungary	38 (1.2)	543 (3.3)	37 (0.9)	517 (3.4)	25 (1.3)	504 (3.4)	9.7 (0.06)
United States	38 (0.9)	559 (2.8)	35 (0.7)	530 (3.7)	27 (0.8)	515 (3.1)	9.7 (0.04)
Canada	38 (0.9)	531 (2.9)	38 (0.8)	508 (2.1)	25 (0.6)	485 (2.5)	9.7 (0.04)
Spain	37 (1.0)	519 (3.5)	39 (0.9)	500 (2.9)	23 (1.1)	484 (2.9)	9.7 (0.04)
Singapore	37 (0.9)	654 (3.5)	40 (0.7)	618 (4.4)	23 (0.8)	594 (4.1)	9.7 (0.04)
Slovak Republic	37 (1.5)	520 (4.4)	39 (1.1)	506 (4.5)	24 (1.0)	500 (3.8)	9.7 (0.06)
Ireland	35 (1.1)	566 (2.9)	37 (1.0)	549 (3.2)	28 (1.1)	529 (3.3)	9.5 (0.05)
Pakistan	35 (3.6)	354 (14.7)	52 (3.2)	318 (11.5)	13 (1.3)	307 (11.5)	9.9 (0.09)
Serbia	35 (1.3)	526 (4.4)	40 (1.1)	505 (3.3)	26 (1.4)	490 (5.1)	9.6 (0.07)
Sweden	34 (1.6)	530 (4.5)	37 (1.1)	523 (3.3)	29 (1.6)	511 (3.2)	9.5 (0.08)
Germany	33 (1.0)	544 (3.1)	38 (1.0)	522 (2.8)	29 (1.2)	503 (3.1)	9.5 (0.05)
Belgium (Flemish)	33 (1.0)	547 (2.8)	39 (0.9)	531 (2.3)	28 (1.0)	518 (2.8)	9.4 (0.04)
Czech Republic	32 (1.2)	553 (3.6)	39 (1.1)	532 (3.2)	28 (1.2)	514 (3.2)	9.4 (0.05)
Latvia	32 (1.2)	565 (3.5)	40 (1.1)	549 (2.7)	28 (1.3)	521 (3.7)	9.5 (0.05)
Norway (5)	32 (1.4)	558 (3.4)	39 (1.1)	541 (3.4)	29 (1.3)	533 (3.4)	9.4 (0.07)
Philippines	32 (1.8)	362 (6.7)	53 (1.3)	278 (6.0)	16 (0.9)	242 (6.8)	9.8 (0.07)
Northern Ireland	31 (1.2)	589 (4.0)	39 (1.1)	572 (3.6)	30 (1.2)	535 (3.8)	9.4 (0.05)
Hong Kong SAR	30 (1.3)	626 (4.9)	38 (1.2)	596 (3.9)	32 (1.4)	585 (3.9)	9.3 (0.06)
Netherlands	30 (1.3)	553 (2.9)	39 (0.8)	538 (2.6)	32 (1.2)	524 (3.2)	9.3 (0.06)
Poland	28 (1.0)	544 (3.4)	41 (0.8)	517 (3.1)	31 (1.2)	505 (3.4)	9.2 (0.05)
Japan	28 (1.0)	622 (2.4)	45 (0.9)	591 (2.2)	27 (1.2)	568 (2.8)	9.4 (0.05)
Denmark	28 (1.2)	543 (3.3)	41 (1.1)	525 (2.9)	31 (1.1)	510 (3.0)	9.2 (0.05)
Finland	28 (0.9)	546 (3.8)	41 (0.7)	535 (2.8)	31 (0.9)	518 (3.2)	9.2 (0.04)
Croatia	25 (1.6)	534 (2.9)	40 (1.4)	506 (3.1)	35 (1.5)	497 (3.1)	9.1 (0.07)
Korea, Rep. of	22 (0.9)	631 (3.2)	38 (1.1)	607 (3.0)	40 (1.1)	576 (2.9)	8.9 (0.04)
Chinese Taipei	22 (0.9)	624 (3.4)	38 (0.9)	603 (2.8)	41 (1.1)	582 (2.2)	8.9 (0.05)
International Average	45 (0.2)	520 (0.5)	35 (0.1)	491 (0.6)	20 (0.1)	479 (0.7)	
Benchmarking Participants							
Dubai, UAE	61 (0.7)	553 (1.8)	27 (0.5)	533 (2.5)	11 (0.5)	526 (4.1)	10.7 (0.04)
Abu Dhabi, UAE	44 (1.1)	462 (2.8)	38 (0.8)	427 (3.1)	18 (0.7)	423 (3.7)	10.1 (0.05)
Quebec, Canada	43 (1.3)	548 (3.1)	37 (1.1)	527 (3.3)	20 (1.0)	502 (3.8)	9.9 (0.05)
Moscow City, Russian Fed.	41 (1.1)	610 (2.6)	39 (0.9)	586 (2.8)	20 (0.9)	572 (3.0)	9.9 (0.04)
Madrid, Spain	37 (1.3)	531 (3.1)	42 (0.9)	516 (2.8)	22 (1.0)	503 (3.2)	9.7 (0.05)
Ontario, Canada	36 (1.6)	532 (5.5)	39 (1.4)	511 (3.4)	25 (1.1)	488 (4.4)	9.6 (0.06)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report achievement.

SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Exhibit 11.3: Students Like Learning Mathematics
Students' Reports

Country	Very Much Like Learning Mathematics		Somewhat Like Learning Mathematics		Do Not Like Learning Mathematics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Egypt	42 (1.3)	437 (5.4)	41 (0.9)	396 (5.6)	17 (0.9)	405 (6.4)	11.1 (0.06)
Morocco	38 (1.1)	409 (3.0)	40 (0.7)	380 (2.9)	22 (0.9)	368 (2.7)	10.8 (0.05)
Jordan	37 (1.3)	441 (4.2)	39 (0.8)	413 (4.8)	24 (1.0)	408 (5.6)	10.8 (0.06)
South Africa (9)	36 (0.7)	403 (2.5)	44 (0.5)	382 (2.6)	19 (0.5)	385 (3.0)	10.8 (0.03)
Iran, Islamic Rep. of	34 (0.9)	478 (5.1)	39 (0.8)	438 (4.6)	27 (1.1)	418 (4.5)	10.6 (0.05)
Oman	31 (0.9)	455 (3.4)	46 (0.7)	396 (3.0)	23 (1.0)	390 (4.1)	10.6 (0.04)
Turkey	29 (1.0)	539 (5.8)	41 (0.8)	485 (4.9)	30 (1.1)	470 (4.8)	10.3 (0.05)
Lebanon	28 (1.3)	456 (3.6)	44 (1.1)	425 (3.9)	28 (1.1)	413 (3.7)	10.4 (0.06)
Saudi Arabia	27 (1.1)	413 (4.0)	36 (0.7)	391 (3.2)	37 (1.0)	386 (3.0)	10.1 (0.05)
Kazakhstan	26 (1.2)	509 (4.9)	54 (1.1)	484 (4.0)	20 (1.1)	472 (5.0)	10.6 (0.05)
United Arab Emirates	26 (0.6)	512 (3.0)	41 (0.6)	471 (2.4)	33 (0.6)	451 (1.9)	10.2 (0.03)
Georgia	25 (1.4)	493 (6.1)	43 (1.1)	461 (4.9)	32 (1.3)	438 (5.3)	10.2 (0.06)
Bahrain	24 (0.8)	510 (3.4)	36 (0.8)	483 (2.4)	40 (1.2)	462 (2.9)	9.9 (0.06)
Singapore	22 (0.7)	653 (4.0)	43 (0.7)	624 (3.9)	35 (0.8)	582 (5.0)	10.1 (0.03)
Malaysia	20 (0.8)	498 (5.2)	57 (0.8)	455 (3.3)	23 (1.0)	442 (4.2)	10.3 (0.04)
Kuwait	20 (0.9)	429 (7.0)	34 (1.0)	406 (6.3)	45 (1.3)	392 (4.4)	9.7 (0.05)
Israel	19 (1.0)	544 (6.3)	36 (1.0)	527 (5.3)	45 (1.4)	505 (4.1)	9.6 (0.06)
Cyprus	19 (0.8)	549 (3.8)	35 (0.8)	513 (2.8)	46 (1.0)	473 (2.4)	9.6 (0.04)
Portugal	19 (0.9)	548 (4.7)	34 (1.0)	508 (3.9)	48 (1.3)	477 (3.3)	9.6 (0.06)
Russian Federation	17 (0.7)	583 (6.3)	46 (0.9)	549 (4.7)	37 (1.1)	519 (5.0)	9.9 (0.04)
United States	17 (0.8)	561 (6.2)	37 (0.6)	528 (5.0)	45 (1.0)	493 (4.7)	9.6 (0.05)
Italy	16 (0.9)	537 (4.3)	34 (1.1)	513 (3.3)	49 (1.3)	474 (2.9)	9.4 (0.06)
Romania	16 (1.0)	537 (6.0)	39 (1.1)	486 (5.6)	44 (1.6)	454 (4.8)	9.7 (0.06)
Qatar	16 (0.8)	486 (5.6)	39 (1.1)	449 (5.9)	45 (1.4)	424 (3.5)	9.6 (0.06)
Ireland	14 (0.7)	567 (4.4)	35 (1.1)	537 (3.1)	50 (1.3)	504 (2.7)	9.4 (0.05)
Chile	14 (0.7)	468 (5.7)	40 (1.2)	449 (3.4)	46 (1.5)	426 (2.9)	9.6 (0.05)
New Zealand	14 (0.6)	528 (5.4)	39 (1.1)	495 (4.1)	47 (1.2)	460 (3.6)	9.5 (0.04)
Australia	13 (0.7)	576 (5.1)	37 (0.8)	536 (4.5)	50 (1.2)	489 (3.4)	9.4 (0.05)
Hong Kong SAR	13 (0.7)	622 (5.8)	39 (1.0)	595 (4.9)	48 (1.4)	554 (4.4)	9.4 (0.05)
Sweden	13 (0.7)	545 (4.7)	34 (0.9)	522 (3.4)	53 (1.2)	482 (2.5)	9.3 (0.05)
England	12 (0.8)	552 (8.5)	38 (1.1)	530 (6.6)	50 (1.2)	500 (5.0)	9.4 (0.04)
Norway (9)	12 (0.8)	558 (4.8)	34 (0.9)	524 (2.5)	54 (1.1)	479 (2.7)	9.2 (0.04)
Lithuania	12 (0.8)	563 (6.3)	43 (1.2)	531 (3.7)	44 (1.3)	500 (3.0)	9.6 (0.04)
Chinese Taipei	12 (0.6)	685 (5.2)	33 (0.7)	643 (3.0)	56 (0.9)	579 (2.7)	9.2 (0.04)
France	11 (0.7)	524 (4.8)	43 (1.2)	498 (3.1)	46 (1.3)	459 (2.5)	9.5 (0.04)
Hungary	11 (0.6)	590 (7.0)	32 (0.9)	538 (4.2)	57 (1.1)	491 (2.9)	9.2 (0.04)
Japan	10 (0.6)	658 (5.3)	34 (0.9)	618 (3.2)	56 (1.1)	569 (2.8)	9.3 (0.04)
Finland	9 (0.6)	572 (4.3)	34 (1.0)	533 (3.3)	57 (1.2)	485 (2.3)	9.1 (0.05)
Korea, Rep. of	8 (0.5)	685 (5.3)	32 (0.9)	638 (3.8)	61 (0.9)	581 (2.8)	9.0 (0.03)
International Average	20 (0.1)	530 (0.8)	39 (0.1)	496 (0.7)	41 (0.2)	468 (0.6)	
Benchmarking Participants							
Gauteng, RSA (9)	33 (1.1)	432 (4.1)	44 (0.7)	415 (3.4)	23 (0.9)	417 (4.0)	10.6 (0.05)
Dubai, UAE	28 (1.1)	569 (4.1)	42 (1.3)	537 (2.6)	29 (0.8)	505 (2.7)	10.4 (0.04)
Western Cape, RSA (9)	27 (1.0)	457 (4.7)	44 (0.8)	434 (5.2)	29 (1.0)	440 (4.8)	10.3 (0.04)
Ontario, Canada	24 (1.1)	569 (3.9)	39 (1.0)	540 (4.8)	37 (1.0)	495 (4.8)	10.0 (0.05)
Abu Dhabi, UAE	21 (0.9)	489 (4.2)	43 (0.9)	425 (3.5)	36 (0.9)	422 (3.5)	10.0 (0.05)
Moscow City, Russian Fed.	19 (0.9)	625 (5.3)	44 (1.1)	586 (4.7)	37 (1.4)	538 (3.8)	9.9 (0.05)
Quebec, Canada	13 (1.0)	586 (4.9)	38 (1.0)	556 (3.3)	48 (1.6)	522 (4.5)	9.5 (0.07)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

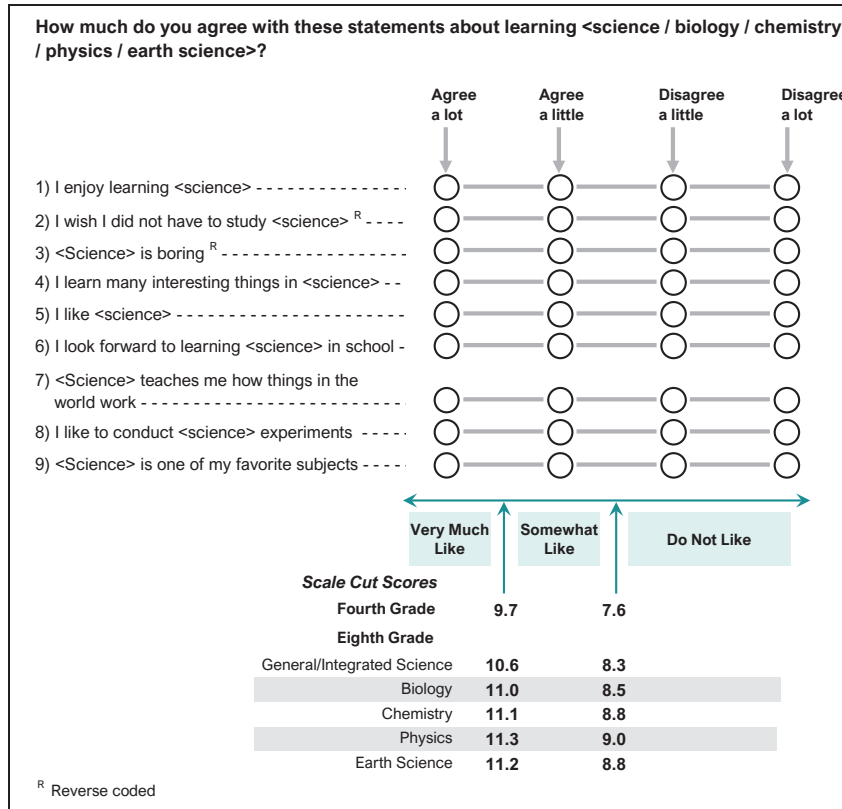
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Exhibit 11.4: Students Like Learning Science
Students' Reports

About the Scale

Students were scored according to their responses to nine statements on the *Students Like Learning Science* scale. Cut scores divide the scale into three categories. Students who **Very Much Like Learning Science** had a score at or above the cut score corresponding to “agreeing a lot” with five of the nine statements and “agreeing a little” with the other four, on average. Students who **Do Not Like Learning Science** had a score at or below the cut score corresponding to “disagreeing a little” with five of the nine statements and “agreeing a little” with the other four, on average. All other students **Somewhat Like Learning Science**. At the eighth grade, a comparable approach was used for biology, chemistry, physics, and Earth science in countries where these were taught as separate subjects.



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Exhibit 11.5: Students Like Learning Science

Students' Reports

Country	Very Much Like Learning Science		Somewhat Like Learning Science		Do Not Like Learning Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	83 (1.1)	498 (3.3)	15 (1.0)	457 (7.8)	1 (0.2)	--	11.6 (0.06)
Portugal	74 (1.0)	513 (2.6)	21 (0.9)	480 (3.7)	4 (0.4)	477 (6.9)	11.2 (0.05)
Kosovo	72 (1.5)	429 (3.9)	25 (1.3)	383 (5.0)	3 (0.4)	364 (14.2)	10.9 (0.06)
Iran, Islamic Rep. of	70 (1.1)	459 (3.4)	24 (1.0)	402 (6.6)	5 (0.5)	402 (9.1)	11.0 (0.06)
Bulgaria	69 (1.6)	533 (4.5)	25 (1.2)	504 (6.8)	6 (0.9)	486 (18.3)	10.8 (0.08)
Morocco	69 (1.3)	401 (5.8)	26 (1.1)	322 (7.6)	5 (0.4)	294 (12.9)	11.0 (0.06)
Turkey (5)	69 (1.6)	544 (3.4)	25 (1.2)	493 (6.5)	6 (0.7)	473 (10.0)	10.9 (0.07)
Bahrain	68 (1.2)	514 (2.9)	24 (0.9)	454 (4.9)	7 (0.6)	445 (7.4)	11.0 (0.06)
Oman	68 (1.3)	464 (4.7)	27 (1.2)	387 (5.4)	5 (0.5)	360 (9.2)	10.9 (0.07)
Armenia	66 (1.3)	483 (3.2)	27 (1.2)	450 (5.3)	8 (0.6)	439 (6.7)	10.8 (0.07)
United Arab Emirates	64 (0.6)	500 (2.2)	28 (0.5)	435 (2.6)	8 (0.3)	410 (4.4)	10.8 (0.03)
Georgia	62 (1.6)	459 (4.1)	32 (1.4)	442 (6.0)	6 (0.6)	459 (9.1)	10.6 (0.07)
Saudi Arabia	61 (1.2)	438 (3.5)	29 (1.0)	356 (5.7)	9 (0.6)	369 (8.2)	10.7 (0.06)
Montenegro	61 (1.2)	467 (2.6)	32 (0.9)	440 (3.3)	7 (0.5)	434 (7.8)	10.5 (0.05)
Azerbaijan	61 (1.4)	448 (2.8)	33 (1.3)	414 (4.2)	6 (0.5)	409 (8.6)	10.3 (0.06)
Kazakhstan	59 (1.3)	503 (3.8)	36 (1.2)	484 (3.4)	5 (0.5)	488 (7.4)	10.4 (0.06)
North Macedonia	59 (1.7)	455 (4.9)	36 (1.7)	397 (8.2)	6 (0.7)	383 (12.5)	10.5 (0.07)
Kuwait	58 (1.4)	430 (6.4)	33 (1.1)	360 (7.7)	9 (0.7)	333 (10.0)	10.5 (0.07)
Malta	58 (0.8)	509 (1.6)	29 (0.6)	484 (3.0)	13 (0.6)	466 (4.0)	10.3 (0.04)
Qatar	56 (1.6)	485 (3.5)	34 (1.3)	415 (5.4)	10 (0.6)	396 (7.4)	10.4 (0.07)
Ireland	56 (1.3)	537 (3.3)	33 (1.0)	523 (4.0)	12 (0.7)	507 (5.2)	10.2 (0.06)
Northern Ireland	56 (1.1)	530 (2.4)	33 (1.0)	510 (3.4)	11 (0.7)	487 (4.5)	10.2 (0.05)
Italy	55 (1.1)	514 (3.5)	35 (0.8)	509 (3.4)	10 (0.7)	495 (4.8)	10.2 (0.05)
Lithuania	53 (1.7)	541 (3.0)	38 (1.3)	538 (3.5)	9 (0.8)	524 (5.0)	9.9 (0.07)
Japan	52 (1.2)	569 (2.1)	39 (1.0)	554 (2.3)	9 (0.6)	551 (4.0)	10.1 (0.06)
United States	52 (1.0)	551 (2.6)	34 (0.8)	533 (3.6)	14 (0.7)	523 (4.8)	10.1 (0.05)
New Zealand	52 (1.1)	513 (3.0)	34 (0.9)	500 (2.8)	14 (0.8)	479 (3.5)	10.0 (0.05)
Chinese Taipei	51 (1.5)	566 (2.0)	37 (1.1)	554 (2.6)	12 (0.9)	537 (4.3)	10.1 (0.07)
Australia	50 (1.4)	539 (3.1)	34 (0.9)	533 (2.9)	16 (1.0)	515 (4.6)	9.9 (0.07)
Singapore	49 (1.0)	605 (3.6)	39 (0.7)	588 (3.9)	12 (0.5)	574 (4.7)	10.0 (0.04)
Bosnia and Herzegovina	49 (1.1)	467 (3.5)	35 (0.8)	453 (3.6)	16 (0.8)	454 (4.6)	9.8 (0.06)
Hong Kong SAR	49 (1.5)	547 (3.5)	37 (1.2)	519 (4.8)	15 (1.0)	509 (6.7)	10.0 (0.08)
Austria	49 (1.1)	533 (2.8)	38 (0.9)	517 (3.5)	13 (0.7)	501 (5.3)	9.9 (0.05)
Canada	49 (1.0)	528 (2.2)	36 (0.8)	524 (2.2)	15 (0.6)	511 (2.8)	9.9 (0.05)
Spain	48 (1.4)	520 (2.7)	40 (1.0)	506 (2.5)	13 (0.8)	503 (6.7)	9.8 (0.06)
Germany	47 (1.4)	535 (2.6)	38 (1.0)	517 (3.7)	15 (0.9)	498 (4.4)	9.8 (0.07)
Norway (5)	47 (1.4)	546 (2.6)	41 (1.0)	540 (2.7)	12 (0.8)	524 (5.2)	9.9 (0.06)
England	46 (1.6)	542 (3.7)	37 (1.2)	540 (3.6)	16 (1.1)	528 (4.8)	9.8 (0.09)
Hungary	46 (1.3)	538 (2.5)	38 (1.0)	523 (3.6)	15 (1.0)	520 (5.0)	9.7 (0.06)
Cyprus	46 (1.7)	525 (3.5)	32 (1.1)	504 (3.2)	22 (1.4)	496 (4.4)	9.6 (0.10)
France	45 (1.2)	496 (3.8)	38 (0.9)	487 (3.4)	17 (1.0)	467 (5.1)	9.7 (0.06)
Russian Federation	44 (1.3)	570 (3.8)	42 (0.9)	565 (3.1)	14 (0.9)	567 (4.2)	9.5 (0.06)
Chile	44 (1.1)	486 (3.2)	44 (0.9)	462 (3.2)	12 (0.8)	450 (5.9)	9.7 (0.06)
South Africa (5)	43 (1.2)	390 (5.2)	45 (0.9)	284 (5.1)	11 (0.5)	264 (6.3)	9.8 (0.05)
Pakistan	42 (3.2)	323 (15.0)	49 (2.5)	269 (15.2)	9 (1.5)	258 (16.1)	9.8 (0.16)
Netherlands	41 (1.3)	530 (3.1)	40 (0.9)	516 (3.6)	19 (0.9)	504 (4.6)	9.5 (0.06)
Belgium (Flemish)	41 (1.4)	507 (2.9)	41 (0.9)	502 (2.8)	19 (1.0)	486 (3.0)	9.5 (0.07)
Latvia	39 (1.3)	546 (3.0)	47 (1.2)	542 (2.7)	14 (0.8)	534 (4.5)	9.4 (0.05)
Sweden	39 (1.5)	538 (4.5)	41 (1.2)	543 (3.4)	20 (1.3)	527 (4.5)	9.4 (0.08)
Serbia	39 (1.5)	522 (4.2)	46 (1.1)	512 (4.3)	15 (1.1)	527 (4.3)	9.5 (0.07)
Slovak Republic	38 (1.6)	525 (4.1)	43 (0.9)	522 (4.7)	19 (1.1)	512 (5.5)	9.4 (0.08)
Poland	38 (1.3)	541 (3.3)	44 (1.0)	527 (2.8)	18 (0.9)	528 (3.7)	9.3 (0.06)
Korea, Rep. of	37 (1.3)	602 (2.7)	47 (0.9)	581 (2.8)	16 (1.0)	572 (3.6)	9.5 (0.06)
Denmark	35 (1.4)	534 (3.1)	43 (1.1)	521 (3.0)	22 (1.3)	509 (3.3)	9.2 (0.07)
Croatia	34 (1.3)	531 (3.2)	50 (1.0)	521 (2.4)	16 (0.9)	518 (4.1)	9.3 (0.06)
Czech Republic	34 (1.4)	541 (4.0)	44 (1.0)	534 (2.9)	22 (1.1)	527 (2.9)	9.2 (0.07)
Philippines	32 (1.8)	334 (7.5)	53 (1.4)	221 (7.1)	15 (0.9)	180 (7.3)	9.3 (0.07)
Finland	26 (1.0)	554 (3.2)	45 (0.9)	556 (3.1)	29 (1.1)	554 (3.1)	8.7 (0.05)
International Average	52 (0.2)	506 (0.5)	36 (0.1)	478 (0.6)	12 (0.1)	467 (0.9)	
Benchmarking Participants							
Dubai, UAE	72 (0.7)	552 (1.6)	23 (0.6)	525 (3.3)	5 (0.4)	523 (6.4)	11.2 (0.04)
Abu Dhabi, UAE	52 (1.1)	455 (3.5)	35 (0.8)	386 (3.7)	14 (0.6)	373 (5.1)	10.2 (0.06)
Quebec, Canada	48 (1.3)	526 (3.1)	34 (1.0)	523 (3.4)	17 (1.0)	507 (3.7)	9.8 (0.07)
Ontario, Canada	46 (1.7)	529 (3.9)	38 (1.3)	527 (3.6)	15 (1.0)	513 (4.3)	9.8 (0.09)
Madrid, Spain	43 (1.5)	530 (2.7)	43 (1.3)	519 (2.3)	13 (0.8)	514 (4.5)	9.7 (0.06)
Moscow City, Russian Fed.	40 (1.2)	597 (2.8)	43 (1.1)	594 (2.8)	17 (1.0)	593 (3.3)	9.4 (0.05)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Exhibit 11.6: Students Like Learning Science*Students' Reports*

The general/integrated science panel summarizes responses for countries where students are enrolled in science as a single subject. The following panels for biology, chemistry, physics, and Earth science summarize responses for countries where students are taught science as separate subjects.

Students Like Learning General/Integrated Science

Country	Very Much Like Learning Science		Somewhat Like Learning Science		Do Not Like Learning Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Jordan	56 (1.6)	479 (3.8)	36 (1.4)	426 (6.1)	8 (0.5)	424 (7.0)	11.1 (0.06)
Egypt	54 (1.6)	426 (5.0)	38 (1.3)	358 (6.5)	8 (0.7)	345 (8.6)	11.0 (0.06)
Turkey	54 (1.4)	536 (3.3)	37 (0.9)	494 (5.0)	10 (0.8)	481 (8.4)	10.8 (0.06)
Iran, Islamic Rep. of	53 (1.3)	469 (3.9)	37 (1.0)	428 (4.4)	11 (0.6)	429 (5.9)	10.8 (0.06)
Kuwait	46 (1.7)	468 (5.5)	39 (1.1)	435 (6.4)	15 (1.1)	414 (7.2)	10.5 (0.07)
Malaysia	46 (1.1)	484 (3.3)	46 (0.8)	450 (3.9)	8 (0.7)	388 (8.0)	10.6 (0.05)
Saudi Arabia	46 (1.3)	454 (3.1)	40 (0.8)	417 (3.3)	14 (0.9)	417 (4.1)	10.6 (0.06)
Oman	46 (1.0)	495 (3.0)	44 (0.8)	438 (3.7)	10 (0.6)	412 (7.0)	10.6 (0.05)
United Arab Emirates	44 (0.6)	523 (2.7)	41 (0.6)	445 (2.6)	15 (0.4)	412 (3.8)	10.5 (0.03)
Bahrain	44 (1.2)	516 (2.4)	40 (0.9)	474 (3.2)	16 (0.7)	448 (4.6)	10.5 (0.06)
South Africa (9)	42 (0.9)	398 (3.4)	45 (0.6)	352 (3.3)	13 (0.5)	353 (4.2)	10.4 (0.04)
Qatar	38 (1.4)	509 (5.0)	45 (1.2)	459 (4.8)	17 (0.9)	441 (5.7)	10.2 (0.06)
Singapore	37 (0.9)	635 (3.8)	49 (0.8)	601 (3.8)	14 (0.6)	558 (6.0)	10.2 (0.04)
United States	31 (0.9)	550 (5.0)	46 (0.7)	522 (4.9)	23 (0.7)	499 (5.7)	9.8 (0.05)
Italy	29 (1.2)	519 (3.4)	50 (1.0)	499 (2.8)	20 (0.9)	481 (3.8)	9.8 (0.05)
Ireland	27 (1.2)	558 (3.5)	42 (1.0)	532 (2.8)	30 (1.3)	493 (4.3)	9.5 (0.06)
Australia	27 (1.1)	569 (4.1)	45 (0.8)	526 (3.5)	28 (1.3)	499 (3.6)	9.6 (0.06)
Israel	27 (1.2)	547 (4.8)	42 (0.8)	512 (5.0)	31 (1.1)	496 (5.2)	9.4 (0.06)
Chile	26 (1.2)	482 (4.7)	53 (1.0)	460 (3.4)	22 (1.2)	450 (3.9)	9.6 (0.06)
New Zealand	25 (1.1)	532 (4.8)	49 (0.9)	499 (4.2)	25 (1.2)	471 (4.6)	9.6 (0.06)
Norway (9)	25 (1.0)	530 (4.5)	51 (1.0)	495 (3.3)	25 (1.0)	467 (4.3)	9.6 (0.05)
England	24 (1.3)	556 (5.9)	45 (1.1)	524 (5.0)	30 (1.3)	485 (5.7)	9.4 (0.06)
Hong Kong SAR	23 (1.0)	541 (6.1)	55 (1.1)	501 (6.1)	22 (1.1)	472 (7.5)	9.6 (0.05)
Chinese Taipei	20 (0.8)	616 (3.2)	51 (0.9)	576 (2.5)	30 (1.0)	544 (2.6)	9.3 (0.04)
Japan	16 (0.8)	605 (4.2)	49 (1.1)	577 (2.4)	35 (1.4)	544 (2.6)	9.1 (0.05)
Korea, Rep. of	12 (0.5)	625 (4.6)	41 (1.0)	577 (3.0)	47 (1.2)	531 (2.4)	8.7 (0.04)
International Average	35 (0.2)	524 (0.8)	44 (0.2)	484 (0.8)	20 (0.2)	460 (1.1)	
Benchmarking Participants							
Dubai, UAE	50 (1.0)	574 (2.7)	38 (0.9)	528 (3.3)	12 (0.6)	498 (5.2)	10.8 (0.05)
Gauteng, RSA (9)	45 (1.2)	438 (4.0)	42 (0.8)	409 (4.9)	13 (0.8)	418 (6.1)	10.5 (0.05)
Abu Dhabi, UAE	35 (1.1)	498 (4.0)	45 (0.8)	389 (4.5)	20 (0.9)	364 (6.4)	10.1 (0.06)
Western Cape, RSA (9)	35 (1.1)	463 (5.8)	48 (0.7)	426 (5.5)	18 (1.0)	439 (6.9)	10.0 (0.05)
Ontario, Canada	33 (1.2)	542 (4.1)	44 (1.2)	518 (3.6)	23 (1.1)	500 (4.5)	9.9 (0.06)
Quebec, Canada	27 (1.5)	556 (4.3)	49 (1.2)	539 (3.8)	24 (1.6)	510 (5.5)	9.6 (0.08)

Separate Science Results*Students Like Learning Biology*

Country	Very Much Like Learning Biology		Somewhat Like Learning Biology		Do Not Like Learning Biology		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Morocco	46 (1.1)	414 (3.4)	43 (0.8)	382 (2.9)	11 (0.7)	372 (4.9)	10.9 (0.05)
Georgia	43 (1.9)	461 (4.3)	43 (1.6)	442 (4.2)	14 (1.2)	437 (7.6)	10.6 (0.08)
Portugal	38 (1.7)	534 (3.2)	47 (1.2)	515 (3.3)	15 (1.1)	505 (4.2)	10.5 (0.08)
Kazakhstan	36 (1.3)	486 (4.0)	56 (1.2)	475 (3.5)	8 (0.6)	471 (7.6)	10.5 (0.05)
Lebanon	36 (1.4)	415 (5.6)	46 (1.0)	361 (5.7)	18 (1.1)	350 (7.2)	10.3 (0.07)
Cyprus	30 (1.1)	511 (3.1)	42 (0.9)	479 (2.8)	28 (1.1)	467 (3.1)	9.8 (0.06)
Romania	29 (1.4)	486 (5.0)	49 (1.2)	464 (4.8)	21 (1.4)	472 (6.3)	10.0 (0.08)
Russian Federation	26 (1.2)	550 (4.8)	52 (1.1)	540 (4.5)	21 (1.1)	541 (5.3)	9.9 (0.06)
Lithuania	26 (1.3)	548 (3.7)	50 (1.1)	531 (3.6)	24 (1.3)	527 (4.7)	9.8 (0.06)
Hungary	23 (1.3)	544 (4.7)	45 (0.9)	526 (3.2)	32 (1.5)	526 (4.0)	9.5 (0.08)
Sweden	20 (1.1)	549 (5.0)	49 (1.2)	529 (3.9)	30 (1.3)	510 (4.2)	9.5 (0.05)
France	19 (1.0)	509 (4.5)	53 (1.1)	491 (3.0)	28 (1.4)	472 (3.7)	9.5 (0.06)
Finland	16 (0.9)	574 (4.2)	48 (0.9)	549 (3.9)	36 (1.2)	531 (3.5)	9.2 (0.05)
International Average	30 (0.4)	506 (1.2)	48 (0.3)	483 (1.1)	22 (0.3)	476 (1.5)	
Benchmarking Participants							
Moscow City, Russian Fed.	22 (1.2)	571 (3.6)	49 (1.0)	566 (3.3)	29 (1.4)	566 (4.2)	9.6 (0.07)

This TIMSS context questionnaire scale for general/integrated science was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011 where science is taught as a single subject. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution. The separate scales for biology, chemistry, physics, and Earth science were each established in 2019 using a comparable approach.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Exhibit 11.6: Students Like Learning Science

Students' Reports

(Continued)

Separate Science Results

Students Like Learning Chemistry

Chemistry	Very Much Like Learning Chemistry		Somewhat Like Learning Chemistry		Do Not Like Learning Chemistry		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Morocco	42 (1.1)	419 (3.7)	45 (0.8)	379 (2.9)	13 (0.8)	376 (4.0)	10.9 (0.06)
Cyprus	42 (1.1)	506 (2.8)	40 (1.1)	480 (2.5)	18 (0.9)	460 (3.7)	10.7 (0.05)
Lebanon	37 (1.7)	415 (5.2)	46 (1.3)	357 (5.8)	16 (1.1)	362 (8.7)	10.6 (0.08)
Georgia	35 (1.5)	472 (4.8)	41 (1.2)	441 (4.5)	23 (1.4)	431 (5.3)	10.4 (0.07)
Kazakhstan	31 (1.3)	496 (4.1)	53 (1.1)	474 (3.5)	16 (1.0)	461 (6.1)	10.4 (0.05)
Portugal	29 (1.4)	545 (3.8)	45 (1.2)	514 (3.4)	26 (1.7)	500 (4.2)	10.1 (0.08)
Russian Federation	27 (1.1)	562 (4.8)	47 (1.1)	541 (4.2)	26 (1.1)	530 (5.7)	10.1 (0.05)
Lithuania	26 (1.3)	559 (4.3)	44 (0.9)	533 (3.4)	30 (1.6)	516 (3.6)	9.9 (0.07)
Romania	24 (1.4)	501 (5.7)	46 (1.2)	465 (4.6)	30 (1.6)	460 (5.9)	9.7 (0.08)
Sweden	18 (1.1)	565 (5.1)	45 (1.1)	525 (4.3)	37 (1.3)	510 (3.7)	9.5 (0.06)
Finland	17 (0.9)	600 (3.4)	42 (0.9)	550 (3.6)	41 (1.3)	521 (3.3)	9.4 (0.06)
Hungary	14 (0.9)	557 (5.7)	38 (1.1)	526 (3.8)	47 (1.5)	525 (2.8)	9.1 (0.06)
France	14 (1.0)	520 (5.5)	47 (1.0)	493 (3.3)	39 (1.4)	473 (3.0)	9.3 (0.06)
International Average	27 (0.3)	516 (1.3)	45 (0.3)	483 (1.1)	28 (0.4)	471 (1.4)	
Benchmarking Participants							
Moscow City, Russian Fed.	24 (1.2)	586 (3.0)	43 (1.0)	566 (3.4)	33 (1.5)	554 (3.7)	9.8 (0.07)

Students Like Learning Physics

Physics	Very Much Like Learning Physics		Somewhat Like Learning Physics		Do Not Like Learning Physics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Morocco	43 (1.1)	420 (3.5)	44 (0.9)	380 (2.9)	13 (0.7)	374 (3.7)	11.1 (0.05)
Lebanon	32 (1.4)	413 (5.4)	48 (1.2)	362 (5.5)	20 (1.0)	369 (8.1)	10.5 (0.07)
Kazakhstan	30 (1.1)	496 (3.9)	56 (1.1)	475 (3.7)	14 (0.8)	460 (5.2)	10.6 (0.04)
Georgia	30 (1.6)	474 (4.8)	46 (1.3)	439 (4.5)	25 (1.6)	438 (5.5)	10.3 (0.08)
Portugal	29 (1.4)	545 (3.8)	45 (1.2)	514 (3.4)	26 (1.7)	500 (4.2)	10.3 (0.08)
Cyprus	29 (1.1)	518 (3.0)	40 (1.0)	481 (2.7)	31 (1.2)	467 (3.5)	10.1 (0.06)
Russian Federation	29 (1.0)	560 (4.3)	50 (1.0)	541 (4.3)	22 (1.1)	528 (6.0)	10.3 (0.05)
Romania	17 (1.1)	509 (5.7)	48 (1.1)	465 (4.5)	34 (1.4)	465 (5.2)	9.7 (0.07)
Lithuania	16 (1.2)	561 (5.2)	42 (1.2)	534 (3.4)	42 (1.8)	525 (3.8)	9.4 (0.08)
Hungary	16 (1.1)	560 (5.3)	38 (1.0)	533 (3.2)	46 (1.7)	517 (3.1)	9.4 (0.07)
Sweden	16 (0.9)	573 (5.4)	43 (1.0)	530 (4.1)	42 (1.2)	510 (3.9)	9.5 (0.05)
France	14 (1.0)	520 (5.5)	47 (1.0)	493 (3.3)	39 (1.4)	473 (3.0)	9.5 (0.06)
Finland	13 (0.7)	600 (4.5)	38 (0.9)	549 (3.8)	49 (1.3)	525 (3.6)	9.2 (0.05)
International Average	24 (0.3)	519 (1.3)	45 (0.3)	484 (1.1)	31 (0.4)	473 (1.3)	
Benchmarking Participants							
Moscow City, Russian Fed.	24 (1.0)	585 (3.9)	47 (1.1)	567 (3.3)	29 (1.4)	551 (3.1)	10.1 (0.06)

Students Like Learning Earth Science

Earth Science	Very Much Like Learning Earth Science		Somewhat Like Learning Earth Science		Do Not Like Learning Earth Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Morocco	40 (0.9)	415 (3.3)	46 (0.6)	384 (2.9)	14 (0.9)	385 (4.7)	10.9 (0.05)
Portugal	38 (1.7)	534 (3.2)	47 (1.2)	515 (3.3)	15 (1.1)	505 (4.2)	10.7 (0.08)
Georgia	33 (1.7)	460 (5.3)	49 (1.3)	446 (3.9)	18 (1.2)	444 (8.1)	10.4 (0.07)
Kazakhstan	30 (1.3)	485 (4.5)	58 (1.2)	475 (3.7)	12 (0.8)	477 (7.2)	10.5 (0.05)
Romania	29 (1.8)	492 (6.2)	52 (1.5)	462 (5.9)	19 (1.4)	473 (8.4)	10.3 (0.08)
Lithuania	23 (1.4)	544 (3.8)	48 (1.1)	532 (3.4)	29 (1.6)	532 (4.0)	9.8 (0.07)
Russian Federation	22 (1.0)	548 (5.2)	52 (1.0)	542 (4.1)	26 (0.9)	544 (5.8)	9.9 (0.05)
France	19 (1.0)	509 (4.5)	53 (1.1)	491 (3.0)	28 (1.4)	472 (3.7)	9.7 (0.06)
Cyprus	19 (0.8)	502 (4.0)	37 (1.1)	489 (3.4)	45 (1.1)	480 (2.8)	9.2 (0.05)
Finland	17 (0.8)	573 (3.7)	50 (0.9)	547 (3.9)	34 (1.1)	529 (3.3)	9.5 (0.05)
Hungary	16 (1.1)	544 (5.3)	39 (1.1)	525 (3.7)	45 (1.8)	529 (3.1)	9.2 (0.08)
Lebanon	--	--	--	--	--	--	--
Sweden	--	--	--	--	--	--	--
International Average	26 (0.4)	510 (1.4)	48 (0.3)	492 (1.2)	26 (0.4)	488 (1.6)	
Benchmarking Participants							
Moscow City, Russian Fed.	17 (1.1)	570 (4.7)	47 (1.3)	568 (3.5)	36 (1.8)	565 (3.4)	9.5 (0.08)

A dash (-) indicates comparable data not available.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Students Confident in Mathematics and Science

Exhibit 11.7 presents the *Students Confident in Mathematics* scale, which contains nine statements about how well students think they can do mathematics (see Mathematics—About the Scale). Both fourth grade and eighth grade students responded to the scale and appear to have a good idea about their relative abilities. At both grades, students expressing confidence had substantially higher average achievement than those not expressing confidence.

Exhibit 11.8 presents the fourth grade results for the *Students Confident in Mathematics* scale. Thirty-two percent of the fourth grade students reported being “very confident,” 44 percent “somewhat confident,” and 23 percent “not confident.” Exhibit 11.9 presents the eighth grade results. At the eighth grade, students’ confidence had eroded, with only 15 percent reporting they are “very confident,” 42 percent “somewhat confident,” and 44 percent “not confident.” The gap in average achievement between the “very confident” and “not confident” eighth grade students was more than 100 scale score points (562 vs. 456).

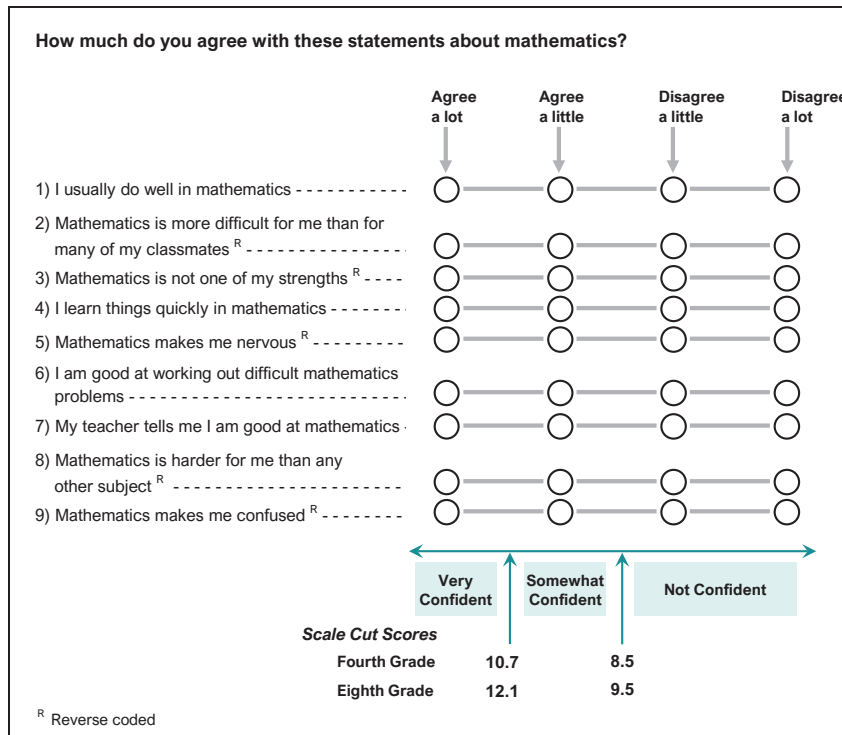
Exhibit 11.10 contains the corresponding confidence scale for science (see Science—About the Scale). Both fourth and eighth grade students responded, with the results at the fourth grade being similar to but slightly more positive than those in mathematics. As shown in Exhibit 11.11, 38 percent of the fourth grade students reported being “very confident,” 43 percent “somewhat confident,” and 19 percent “not confident.”

Exhibit 11.12 presents the eighth grade results for the *Students Confident in Science* scale. The first panel shows the results for countries that have science as an integrated subject, followed by the results for biology, chemistry, physics, and Earth science as separate courses. Eighth grade students did not report being as confident in doing science as did fourth grade students. However, relatively speaking, the eighth grade students expressed the most confidence in biology and Earth science, with 22–23 percent “very confident,” 46 percent “somewhat confident,” and 31–32 percent “not confident.” Although less positive, the results also were similar for integrated science and chemistry—20–23 percent “very confident,” 39 percent “somewhat confident,” and 38–41 percent “not confident.” Eighth grade students’ confidence in physics was the lowest of the science results (and similar to mathematics). Only 17 percent reported “very confident,” 38 percent “somewhat confident,” and 44 percent “not confident.”

Exhibit 11.7: Students Confident in Mathematics
Students' Reports

About the Scale

Students were scored according to their responses to nine statements on the *Students Confident in Mathematics* scale. Cut scores divide the scale into three categories. Students **Very Confident in Mathematics** had a score at or above the cut score corresponding to “agreeing a lot” with five of the nine statements and “agreeing a little” with the other four, on average. Students who were **Not Confident in Mathematics** had a score at or below the cut score corresponding to “disagreeing a little” with five of the nine statements and “agreeing a little” with the other four, on average. All other students were **Somewhat Confident in Mathematics**.



SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Exhibit 11.8: Students Confident in Mathematics
Students' Reports

Country	Very Confident in Mathematics		Somewhat Confident in Mathematics		Not Confident in Mathematics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Montenegro	52 (0.9)	485 (2.2)	35 (0.9)	431 (2.6)	14 (0.5)	394 (4.7)	11.1 (0.04)
Albania	52 (1.4)	524 (3.1)	37 (1.1)	476 (4.0)	12 (0.8)	426 (6.9)	11.0 (0.07)
Kosovo	51 (1.0)	473 (3.1)	38 (1.1)	430 (3.4)	11 (0.7)	381 (7.1)	11.0 (0.04)
North Macedonia	49 (1.5)	513 (5.1)	36 (1.3)	455 (6.0)	15 (0.9)	401 (7.7)	10.9 (0.06)
Cyprus	48 (1.2)	568 (2.7)	37 (0.9)	512 (2.8)	14 (0.8)	468 (4.6)	10.8 (0.06)
Azerbaijan	44 (1.3)	553 (2.8)	41 (1.1)	504 (3.2)	15 (0.8)	480 (3.9)	10.7 (0.05)
Bulgaria	44 (1.2)	553 (3.7)	37 (1.0)	506 (4.0)	19 (1.4)	455 (8.1)	10.5 (0.09)
Saudi Arabia	44 (1.2)	440 (3.6)	39 (0.9)	385 (3.7)	17 (0.8)	342 (6.1)	10.6 (0.05)
Armenia	43 (1.1)	528 (2.9)	40 (0.8)	492 (3.0)	17 (0.7)	459 (4.3)	10.6 (0.05)
Bosnia and Herzegovina	42 (0.9)	486 (2.6)	37 (0.7)	441 (3.0)	21 (0.8)	410 (3.0)	10.5 (0.05)
Bahrain	42 (1.4)	504 (3.1)	40 (1.0)	471 (2.8)	18 (1.0)	446 (3.3)	10.5 (0.07)
Kazakhstan	41 (1.4)	532 (2.8)	47 (1.2)	503 (2.9)	12 (0.7)	487 (4.8)	10.6 (0.06)
Georgia	40 (1.3)	511 (4.0)	44 (1.2)	472 (4.1)	16 (0.9)	431 (6.3)	10.4 (0.06)
Austria	39 (0.9)	573 (2.0)	40 (0.9)	531 (2.4)	20 (0.8)	493 (3.5)	10.3 (0.04)
Netherlands	38 (1.0)	574 (2.7)	41 (1.1)	529 (2.3)	21 (0.9)	488 (2.8)	10.3 (0.05)
Morocco	37 (1.2)	425 (4.3)	48 (1.1)	370 (5.7)	16 (0.8)	336 (6.7)	10.4 (0.05)
Norway (5)	37 (1.1)	581 (3.1)	46 (1.2)	534 (2.6)	18 (0.8)	496 (4.3)	10.3 (0.05)
Sweden	37 (1.3)	551 (3.6)	48 (1.1)	513 (3.2)	15 (0.8)	479 (4.1)	10.2 (0.06)
Hungary	36 (1.0)	571 (2.6)	42 (0.9)	512 (2.9)	22 (0.9)	468 (3.8)	10.2 (0.05)
Oman	36 (1.2)	479 (5.2)	46 (0.9)	418 (4.1)	18 (0.9)	378 (4.2)	10.3 (0.05)
Turkey (5)	34 (1.0)	575 (4.2)	42 (0.7)	513 (4.7)	23 (0.9)	468 (5.9)	10.1 (0.05)
Italy	34 (1.1)	537 (3.4)	46 (1.1)	513 (2.8)	20 (1.0)	483 (3.4)	10.2 (0.05)
Serbia	34 (1.2)	555 (3.4)	45 (1.2)	500 (3.7)	21 (1.2)	450 (4.5)	10.1 (0.07)
Iran, Islamic Rep. of	34 (1.1)	480 (4.7)	46 (1.1)	435 (4.1)	20 (1.2)	406 (6.1)	10.2 (0.06)
Germany	33 (0.9)	565 (2.7)	43 (1.0)	518 (2.4)	23 (1.1)	477 (3.1)	10.0 (0.04)
United Arab Emirates	33 (0.6)	514 (1.9)	44 (0.5)	478 (2.0)	22 (0.5)	448 (2.7)	10.2 (0.03)
Malta	33 (0.7)	547 (2.0)	41 (0.9)	504 (2.1)	26 (0.7)	468 (2.5)	10.0 (0.03)
France	33 (0.9)	524 (3.5)	46 (1.0)	483 (3.5)	21 (0.8)	428 (3.9)	10.0 (0.04)
Ireland	33 (0.7)	585 (3.0)	45 (1.0)	545 (3.0)	22 (0.9)	503 (3.3)	10.0 (0.03)
United States	32 (0.8)	587 (2.6)	42 (0.6)	533 (2.4)	26 (0.7)	482 (3.3)	10.0 (0.04)
Finland	32 (0.9)	573 (2.5)	50 (0.9)	524 (2.7)	17 (0.7)	481 (3.4)	10.1 (0.03)
Canada	32 (0.5)	555 (2.4)	45 (0.6)	506 (2.3)	24 (0.6)	464 (2.2)	10.0 (0.03)
England	31 (1.2)	607 (4.5)	45 (1.0)	549 (3.7)	24 (1.0)	506 (4.2)	9.9 (0.05)
Kuwait	31 (1.5)	432 (5.4)	44 (1.2)	383 (5.4)	25 (1.1)	347 (5.6)	10.0 (0.06)
Slovak Republic	31 (1.1)	550 (3.4)	47 (1.1)	506 (3.7)	22 (0.9)	463 (4.5)	9.9 (0.05)
Belgium (Flemish)	30 (0.7)	573 (2.3)	45 (0.9)	529 (2.3)	25 (0.8)	489 (2.7)	9.9 (0.03)
Croatia	30 (1.4)	550 (2.7)	50 (1.1)	503 (2.6)	20 (1.0)	467 (3.7)	10.0 (0.06)
Lithuania	29 (1.0)	590 (3.6)	51 (1.0)	535 (3.0)	20 (0.9)	492 (4.0)	9.9 (0.04)
Northern Ireland	29 (1.0)	613 (3.8)	45 (1.0)	569 (3.2)	26 (0.8)	510 (3.8)	9.8 (0.04)
Denmark	29 (0.9)	569 (2.8)	49 (1.1)	521 (2.6)	23 (0.8)	478 (2.8)	9.8 (0.03)
Australia	29 (0.8)	568 (3.4)	46 (0.8)	513 (3.2)	25 (0.9)	465 (3.2)	9.9 (0.04)
Qatar	28 (1.2)	491 (4.3)	43 (0.9)	447 (4.4)	28 (0.9)	418 (4.2)	9.9 (0.05)
Spain	27 (0.7)	550 (2.5)	43 (0.7)	502 (2.5)	30 (0.7)	463 (2.8)	9.7 (0.03)
Russian Federation	24 (0.9)	603 (3.4)	46 (1.1)	571 (3.1)	30 (1.1)	533 (4.4)	9.6 (0.04)
Latvia	23 (0.9)	595 (3.0)	45 (0.9)	551 (2.6)	31 (0.9)	503 (3.5)	9.5 (0.04)
Poland	23 (0.8)	571 (3.5)	47 (0.9)	526 (2.7)	30 (1.0)	476 (2.8)	9.5 (0.04)
Czech Republic	23 (1.0)	577 (3.5)	49 (0.8)	539 (2.6)	29 (1.0)	492 (3.2)	9.5 (0.04)
Portugal	22 (0.9)	580 (2.8)	43 (1.0)	532 (3.1)	36 (1.2)	485 (2.7)	9.5 (0.05)
Chile	22 (0.8)	495 (3.3)	46 (0.9)	441 (2.9)	33 (0.9)	411 (3.4)	9.5 (0.04)
Singapore	21 (0.9)	683 (2.9)	42 (0.8)	637 (3.9)	37 (1.2)	579 (3.4)	9.3 (0.05)
New Zealand	20 (0.6)	546 (3.6)	49 (0.9)	492 (2.6)	31 (0.9)	446 (3.2)	9.4 (0.03)
Hong Kong SAR	18 (0.8)	652 (4.2)	43 (1.1)	606 (3.6)	39 (1.2)	573 (3.7)	9.2 (0.05)
Pakistan	18 (3.1)	374 (19.2)	56 (2.2)	328 (10.5)	26 (2.3)	302 (12.6)	9.7 (0.17)
South Africa (5)	17 (0.7)	456 (4.9)	53 (0.5)	371 (3.6)	31 (0.9)	340 (3.7)	9.4 (0.03)
Japan	16 (0.6)	646 (3.3)	53 (0.9)	601 (2.0)	32 (0.9)	554 (2.3)	9.2 (0.03)
Chinese Taipei	15 (0.7)	650 (3.5)	41 (1.0)	610 (2.6)	44 (1.0)	572 (2.4)	9.0 (0.03)
Korea, Rep. of	15 (0.7)	651 (2.6)	49 (1.1)	614 (2.5)	36 (0.9)	559 (2.7)	9.2 (0.03)
Philippines	8 (0.7)	403 (9.9)	56 (1.0)	306 (6.0)	36 (1.2)	269 (6.7)	9.0 (0.04)
International Average	32 (0.1)	545 (0.6)	44 (0.1)	497 (0.5)	23 (0.1)	456 (0.6)	
Benchmarking Participants							
Quebec, Canada	39 (1.1)	568 (2.8)	44 (1.2)	521 (2.7)	17 (0.9)	476 (3.4)	10.3 (0.05)
Dubai, UAE	32 (0.8)	565 (2.5)	46 (0.9)	541 (2.3)	21 (0.8)	519 (3.0)	10.1 (0.04)
Ontario, Canada	29 (0.9)	558 (4.4)	45 (1.0)	509 (4.0)	26 (0.9)	470 (3.6)	9.8 (0.04)
Abu Dhabi, UAE	29 (0.9)	481 (2.7)	45 (0.7)	437 (2.6)	26 (0.6)	408 (3.5)	9.9 (0.04)
Madrid, Spain	28 (0.8)	562 (2.7)	45 (0.9)	516 (2.4)	27 (0.9)	477 (2.9)	9.8 (0.04)
Moscow City, Russian Fed.	27 (0.8)	630 (2.5)	46 (0.8)	596 (2.5)	27 (0.8)	550 (2.9)	9.7 (0.03)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Exhibit 11.9: Students Confident in Mathematics
Students' Reports

Country	Very Confident in Mathematics		Somewhat Confident in Mathematics		Not Confident in Mathematics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Israel	25 (1.1)	582 (5.4)	43 (0.9)	515 (4.4)	32 (1.2)	482 (4.1)	10.7 (0.07)
Egypt	23 (1.0)	459 (4.8)	49 (0.8)	413 (5.6)	28 (1.0)	385 (5.8)	10.8 (0.05)
Norway (9)	21 (0.8)	580 (2.9)	39 (1.1)	513 (2.8)	40 (1.0)	456 (2.7)	10.3 (0.05)
Lebanon	21 (1.0)	479 (4.2)	45 (1.1)	429 (3.0)	34 (1.3)	405 (4.0)	10.5 (0.06)
Cyprus	20 (0.7)	569 (3.1)	37 (0.9)	513 (2.8)	43 (0.9)	460 (3.0)	10.1 (0.04)
Jordan	20 (1.0)	478 (4.1)	47 (0.7)	420 (4.2)	32 (1.1)	392 (5.0)	10.6 (0.05)
United States	20 (0.8)	578 (5.0)	40 (0.7)	537 (4.5)	40 (1.0)	471 (4.2)	10.3 (0.05)
Iran, Islamic Rep. of	20 (0.7)	517 (5.9)	43 (1.0)	447 (4.6)	37 (1.0)	408 (3.8)	10.4 (0.04)
Bahrain	20 (0.7)	533 (3.6)	44 (0.8)	482 (2.5)	36 (0.9)	452 (2.8)	10.4 (0.04)
Saudi Arabia	19 (0.8)	444 (4.0)	49 (0.7)	395 (3.1)	32 (0.9)	366 (2.6)	10.5 (0.05)
United Arab Emirates	18 (0.5)	536 (2.9)	45 (0.4)	478 (2.2)	37 (0.4)	442 (2.3)	10.4 (0.02)
Italy	18 (0.7)	554 (3.9)	37 (1.0)	514 (2.9)	45 (1.2)	462 (2.9)	9.9 (0.06)
Oman	17 (0.7)	486 (4.5)	50 (0.8)	411 (3.2)	33 (0.8)	380 (2.9)	10.5 (0.04)
Hungary	16 (0.6)	609 (4.1)	39 (0.8)	530 (3.5)	45 (1.0)	471 (3.1)	10.0 (0.05)
Sweden	16 (0.8)	578 (3.1)	43 (0.9)	516 (2.8)	41 (1.1)	461 (2.9)	10.1 (0.05)
Turkey	15 (0.7)	600 (5.6)	35 (0.9)	513 (5.2)	50 (1.0)	453 (4.0)	9.8 (0.05)
Georgia	15 (0.9)	517 (6.1)	44 (1.2)	473 (4.3)	41 (1.4)	422 (4.8)	10.2 (0.06)
Ireland	15 (0.7)	584 (3.6)	44 (1.1)	533 (3.1)	41 (1.3)	495 (2.2)	10.0 (0.05)
Finland	15 (0.7)	586 (3.3)	40 (0.7)	523 (2.9)	45 (1.0)	473 (2.4)	10.0 (0.04)
Morocco	15 (0.6)	440 (3.6)	47 (0.6)	390 (2.6)	39 (0.9)	368 (2.1)	10.2 (0.04)
England	14 (0.9)	588 (6.6)	49 (1.0)	528 (5.7)	38 (1.3)	480 (5.2)	10.1 (0.05)
Australia	14 (0.6)	594 (5.1)	42 (0.8)	540 (4.3)	44 (1.0)	474 (3.3)	9.9 (0.05)
France	13 (0.7)	556 (3.8)	42 (0.9)	498 (3.0)	45 (1.1)	446 (2.4)	9.8 (0.05)
Lithuania	13 (0.7)	604 (4.1)	42 (0.9)	535 (4.1)	45 (1.2)	484 (2.9)	9.9 (0.05)
Qatar	13 (0.9)	516 (7.5)	44 (1.1)	455 (4.5)	43 (1.2)	413 (3.9)	10.0 (0.06)
Kazakhstan	13 (0.7)	539 (4.5)	54 (1.2)	494 (3.7)	34 (1.3)	459 (3.6)	10.3 (0.05)
Singapore	12 (0.5)	679 (3.5)	40 (0.8)	637 (3.6)	48 (0.9)	582 (5.0)	9.7 (0.04)
Kuwait	12 (0.6)	466 (7.6)	43 (0.8)	408 (5.5)	45 (0.9)	385 (4.5)	9.9 (0.04)
Russian Federation	12 (0.7)	609 (5.3)	44 (0.9)	563 (4.3)	45 (0.9)	508 (5.1)	9.9 (0.04)
Portugal	11 (0.7)	580 (5.6)	34 (1.1)	525 (3.3)	55 (1.2)	469 (3.4)	9.5 (0.05)
Romania	10 (0.7)	579 (5.9)	31 (1.0)	510 (5.6)	58 (1.2)	446 (4.2)	9.4 (0.05)
New Zealand	10 (0.6)	569 (4.6)	44 (0.9)	502 (3.8)	45 (0.7)	445 (3.6)	9.8 (0.04)
Chile	10 (0.6)	509 (5.1)	41 (1.1)	452 (3.2)	49 (1.3)	418 (2.9)	9.7 (0.04)
Chinese Taipei	9 (0.4)	706 (5.4)	31 (0.7)	656 (3.2)	59 (0.8)	575 (2.6)	9.2 (0.04)
Hong Kong SAR	9 (0.7)	646 (7.3)	37 (1.0)	600 (4.5)	54 (1.1)	554 (4.3)	9.4 (0.05)
Korea, Rep. of	8 (0.5)	695 (4.8)	38 (0.8)	644 (3.8)	54 (0.9)	567 (2.7)	9.5 (0.03)
South Africa (9)	7 (0.3)	468 (4.2)	40 (0.5)	396 (2.6)	53 (0.6)	376 (2.1)	9.6 (0.02)
Japan	6 (0.4)	688 (5.8)	33 (0.8)	629 (3.1)	61 (0.9)	567 (2.9)	9.1 (0.04)
Malaysia	3 (0.3)	584 (10.5)	33 (0.8)	478 (4.6)	64 (0.9)	448 (2.7)	9.2 (0.03)
International Average	15 (0.1)	562 (0.8)	42 (0.1)	502 (0.6)	44 (0.2)	456 (0.6)	
Benchmarking Participants							
Ontario, Canada	27 (1.0)	587 (3.8)	43 (1.1)	536 (5.8)	30 (1.1)	472 (4.0)	10.8 (0.06)
Quebec, Canada	25 (1.4)	592 (3.4)	41 (1.3)	548 (4.2)	34 (1.5)	503 (4.2)	10.6 (0.08)
Dubai, UAE	21 (0.9)	591 (4.2)	46 (0.8)	539 (2.5)	33 (0.7)	500 (2.6)	10.5 (0.04)
Moscow City, Russian Fed.	14 (0.6)	640 (4.7)	45 (1.1)	599 (4.4)	40 (1.2)	526 (3.7)	10.0 (0.05)
Abu Dhabi, UAE	14 (0.6)	516 (4.0)	45 (0.7)	441 (3.6)	41 (0.8)	407 (3.3)	10.2 (0.04)
Western Cape, RSA (9)	9 (0.7)	536 (7.6)	36 (1.0)	459 (5.3)	55 (1.4)	416 (3.8)	9.5 (0.06)
Gauteng, RSA (9)	8 (0.7)	501 (7.3)	38 (0.9)	430 (3.0)	54 (1.1)	403 (3.0)	9.5 (0.05)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

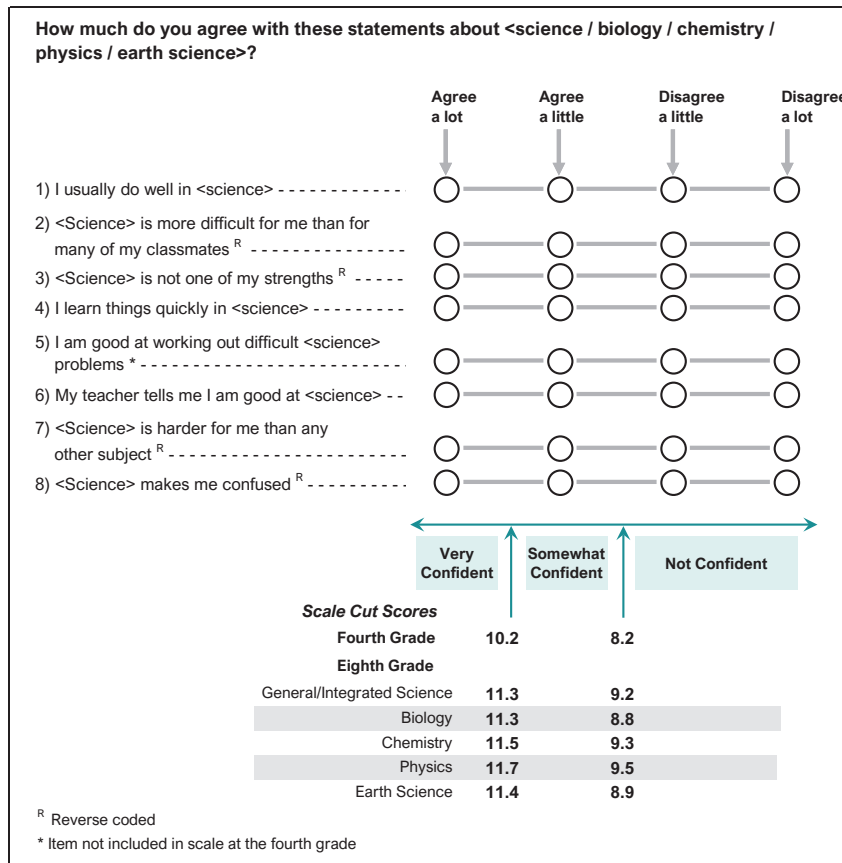
() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Exhibit 11.10: Students Confident in Science
Students' Reports

About the Scale

Students were scored according to their responses to eight statements on the *Students Confident in Science* scale. Cut scores divide the scale into three categories. Students **Very Confident in Science** had a score at or above the cut score corresponding to “agreeing a lot” with four of the eight statements and “agreeing a little” with the other four, on average. Students who were **Not Confident in Science** had a score at or below the cut score corresponding to “disagreeing a little” with four of the eight statements and “agreeing a little” with the other four, on average. All other students were **Somewhat Confident in Science**. At the eighth grade, a comparable approach was used for biology, chemistry, physics, and Earth science in countries where these were taught as separate subjects.



SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Exhibit 11.11: Students Confident in Science
Students' Reports

Country	Very Confident in Science		Somewhat Confident in Science		Not Confident in Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	60 (1.6)	509 (3.7)	30 (1.4)	474 (5.0)	9 (0.7)	428 (9.0)	10.9 (0.07)
Bulgaria	58 (1.8)	555 (3.9)	30 (1.1)	499 (6.5)	12 (1.1)	443 (8.3)	10.7 (0.08)
Iran, Islamic Rep. of	57 (1.4)	472 (4.2)	30 (1.0)	416 (5.5)	13 (1.0)	374 (7.5)	10.7 (0.06)
Bahrain	57 (1.3)	521 (3.2)	30 (0.9)	473 (4.0)	13 (0.7)	430 (6.3)	10.8 (0.06)
Montenegro	53 (1.1)	482 (2.8)	30 (0.8)	443 (3.2)	17 (0.7)	403 (4.5)	10.5 (0.04)
Saudi Arabia	51 (1.2)	444 (3.7)	32 (1.0)	386 (5.6)	16 (0.9)	341 (7.7)	10.5 (0.06)
Turkey (5)	50 (1.4)	556 (3.8)	36 (1.0)	510 (4.6)	14 (0.9)	470 (7.0)	10.4 (0.06)
Oman	50 (1.4)	480 (5.2)	35 (1.1)	412 (4.4)	15 (0.8)	363 (6.3)	10.5 (0.06)
Austria	49 (1.1)	544 (2.7)	37 (1.0)	511 (3.0)	13 (0.7)	474 (4.8)	10.4 (0.04)
North Macedonia	49 (2.0)	471 (5.1)	35 (1.7)	403 (7.1)	16 (0.9)	365 (8.2)	10.4 (0.08)
Azerbaijan	48 (1.4)	457 (3.2)	36 (1.2)	422 (3.8)	16 (0.8)	395 (6.0)	10.3 (0.06)
Armenia	47 (1.3)	490 (3.3)	36 (1.1)	462 (4.2)	17 (0.8)	436 (5.8)	10.3 (0.06)
Kosovo	47 (1.2)	444 (3.9)	37 (1.0)	404 (4.2)	16 (0.9)	361 (7.0)	10.3 (0.05)
United Arab Emirates	46 (0.6)	505 (2.5)	36 (0.5)	465 (2.5)	17 (0.4)	417 (3.2)	10.3 (0.03)
Kuwait	46 (1.4)	435 (6.7)	36 (0.9)	384 (6.7)	18 (0.9)	338 (9.0)	10.3 (0.06)
Bosnia and Herzegovina	46 (0.9)	482 (3.3)	36 (0.7)	451 (3.5)	19 (0.7)	425 (4.3)	10.2 (0.04)
Morocco	46 (1.2)	416 (4.9)	39 (0.8)	355 (7.9)	15 (0.8)	305 (9.0)	10.3 (0.05)
Hungary	45 (1.2)	553 (2.6)	39 (0.8)	520 (3.2)	16 (0.8)	484 (5.1)	10.2 (0.05)
Georgia	44 (1.4)	472 (4.3)	38 (1.1)	448 (5.3)	19 (1.1)	423 (6.1)	10.1 (0.06)
Kazakhstan	43 (1.4)	511 (3.9)	46 (1.1)	485 (3.4)	11 (0.7)	479 (5.4)	10.2 (0.06)
Portugal	43 (1.2)	522 (2.8)	44 (1.0)	499 (2.8)	13 (0.6)	463 (4.0)	10.1 (0.04)
Qatar	42 (1.4)	488 (3.9)	38 (1.0)	441 (6.2)	20 (1.0)	395 (5.6)	10.1 (0.06)
Malta	42 (0.9)	521 (2.1)	38 (0.8)	488 (2.4)	20 (0.7)	457 (3.0)	9.9 (0.03)
Norway (5)	41 (1.1)	557 (2.4)	46 (1.1)	535 (3.0)	12 (0.8)	511 (5.0)	10.0 (0.04)
Germany	40 (1.1)	551 (2.8)	44 (0.8)	517 (3.1)	17 (0.9)	471 (4.6)	9.9 (0.04)
Cyprus	39 (1.5)	535 (3.1)	37 (1.1)	504 (2.9)	23 (1.1)	485 (4.6)	9.9 (0.07)
Italy	39 (1.0)	522 (3.8)	46 (0.9)	509 (3.1)	15 (0.9)	483 (4.5)	10.0 (0.04)
Croatia	39 (1.2)	541 (2.5)	49 (1.2)	518 (2.4)	12 (0.9)	496 (4.9)	10.0 (0.05)
United States	38 (0.9)	565 (2.7)	42 (0.7)	540 (2.9)	20 (0.7)	500 (4.4)	9.8 (0.04)
Belgium (Flemish)	37 (1.1)	521 (2.5)	45 (0.9)	498 (2.5)	18 (0.8)	467 (3.5)	9.8 (0.05)
Serbia	37 (1.4)	540 (4.0)	47 (1.2)	515 (4.1)	17 (1.0)	476 (6.7)	9.9 (0.06)
Sweden	36 (1.5)	552 (4.0)	49 (1.1)	538 (3.2)	14 (0.9)	504 (6.5)	9.8 (0.06)
Spain	35 (1.1)	535 (2.7)	41 (1.0)	508 (2.2)	23 (1.0)	486 (3.4)	9.8 (0.05)
Canada	35 (0.7)	540 (2.4)	46 (0.7)	523 (2.1)	19 (0.7)	498 (2.5)	9.7 (0.03)
Ireland	35 (0.9)	542 (4.0)	48 (0.9)	529 (3.9)	18 (0.9)	502 (4.4)	9.7 (0.04)
Slovak Republic	33 (1.2)	546 (3.4)	46 (1.0)	519 (4.1)	21 (0.9)	487 (6.9)	9.6 (0.05)
Netherlands	32 (1.1)	541 (3.7)	48 (1.0)	519 (3.1)	19 (1.0)	486 (3.8)	9.6 (0.05)
Australia	32 (1.1)	553 (3.0)	47 (0.9)	532 (2.8)	21 (0.9)	508 (4.1)	9.6 (0.04)
Poland	32 (1.2)	553 (3.3)	49 (0.9)	531 (2.8)	19 (0.8)	503 (3.6)	9.6 (0.05)
Chinese Taipei	31 (1.0)	583 (2.2)	51 (0.9)	556 (2.1)	18 (1.0)	522 (3.4)	9.6 (0.04)
Latvia	31 (1.1)	559 (2.8)	51 (1.1)	540 (2.8)	18 (1.0)	520 (3.7)	9.6 (0.04)
Russian Federation	29 (1.0)	583 (3.1)	46 (1.1)	567 (3.5)	24 (0.9)	550 (3.5)	9.5 (0.05)
Lithuania	29 (1.2)	564 (3.0)	52 (1.0)	533 (3.1)	19 (1.0)	516 (4.3)	9.6 (0.05)
Northern Ireland	29 (1.0)	536 (3.1)	49 (0.9)	523 (2.9)	22 (0.8)	487 (4.1)	9.4 (0.04)
Denmark	29 (1.2)	545 (3.3)	50 (1.1)	522 (2.6)	21 (1.0)	493 (3.2)	9.5 (0.05)
England	28 (1.0)	559 (4.2)	47 (1.0)	538 (3.2)	25 (1.2)	516 (3.9)	9.4 (0.05)
Finland	27 (0.8)	573 (3.4)	57 (0.9)	555 (2.6)	16 (0.7)	525 (4.0)	9.5 (0.03)
France	27 (0.9)	517 (3.8)	48 (1.0)	492 (3.3)	25 (1.0)	451 (4.1)	9.4 (0.04)
Japan	27 (0.9)	582 (2.7)	59 (0.8)	558 (1.9)	14 (0.7)	540 (3.7)	9.5 (0.03)
Czech Republic	25 (1.0)	560 (3.9)	50 (1.0)	535 (3.3)	25 (1.2)	507 (2.9)	9.3 (0.05)
South Africa (5)	23 (0.8)	421 (6.3)	47 (0.7)	317 (5.4)	30 (0.7)	274 (5.2)	9.3 (0.03)
Singapore	23 (0.6)	626 (3.6)	44 (0.7)	599 (3.6)	33 (0.7)	567 (3.9)	9.1 (0.03)
Pakistan	23 (3.2)	333 (19.9)	49 (2.3)	289 (14.4)	28 (3.5)	262 (14.1)	9.4 (0.16)
Chile	23 (1.0)	508 (3.8)	48 (0.8)	473 (2.8)	30 (0.9)	439 (3.6)	9.2 (0.04)
Hong Kong SAR	23 (0.9)	562 (3.9)	49 (1.1)	532 (3.5)	29 (1.2)	506 (4.9)	9.2 (0.05)
New Zealand	21 (0.7)	529 (3.3)	53 (0.9)	508 (2.7)	26 (0.8)	476 (3.3)	9.2 (0.03)
Korea, Rep. of	17 (0.8)	620 (3.1)	59 (1.1)	587 (2.6)	23 (1.0)	564 (3.2)	9.1 (0.03)
Philippines	10 (0.9)	372 (10.6)	52 (0.9)	258 (7.2)	38 (1.2)	212 (7.4)	8.8 (0.04)
International Average	38 (0.2)	520 (0.6)	43 (0.1)	486 (0.6)	19 (0.1)	453 (0.7)	
Benchmarking Participants							
Dubai, UAE	48 (0.9)	559 (2.0)	38 (0.9)	537 (2.9)	13 (0.5)	516 (4.3)	10.3 (0.03)
Abu Dhabi, UAE	37 (1.0)	462 (4.1)	39 (0.7)	412 (3.4)	24 (0.8)	369 (4.3)	9.9 (0.04)
Quebec, Canada	36 (1.1)	537 (3.4)	47 (1.2)	519 (3.0)	17 (1.0)	496 (3.5)	9.8 (0.05)
Madrid, Spain	34 (1.1)	546 (2.5)	41 (1.0)	521 (2.7)	25 (0.9)	496 (3.1)	9.6 (0.05)
Moscow City, Russian Fed.	33 (1.2)	606 (3.2)	45 (0.9)	599 (2.6)	22 (1.0)	571 (3.7)	9.6 (0.04)
Ontario, Canada	32 (1.1)	541 (4.6)	46 (1.1)	527 (3.2)	22 (1.1)	501 (4.0)	9.6 (0.05)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent. An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
 Downloaded from <http://timss2019.org/download>

Exhibit 11.12: Students Confident in Science

Students' Reports

The general/integrated science panel summarizes responses for countries where students are enrolled in science as a single subject. The following panels for biology, chemistry, physics, and Earth science summarize responses for countries where students are taught science as separate subjects.

Students Confident in General/Integrated Science

General/Integrated Science	Very Confident in Science		Somewhat Confident in Science		Not Confident in Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Iran, Islamic Rep. of	38 (1.1)	490 (3.9)	40 (0.9)	434 (4.3)	22 (0.9)	407 (4.0)	11.0 (0.06)
Turkey	38 (1.2)	569 (3.5)	37 (0.8)	502 (4.2)	25 (1.0)	455 (4.5)	10.9 (0.06)
Jordan	37 (1.4)	502 (3.6)	38 (0.6)	448 (4.5)	25 (1.3)	400 (5.8)	11.0 (0.07)
Bahrain	36 (1.3)	531 (2.4)	38 (0.7)	487 (3.8)	26 (1.0)	432 (4.1)	10.8 (0.06)
Egypt	35 (1.1)	445 (5.1)	38 (0.7)	384 (5.7)	27 (1.1)	343 (6.8)	10.8 (0.06)
Saudi Arabia	33 (1.0)	474 (3.4)	42 (0.8)	425 (3.1)	25 (1.0)	399 (3.7)	10.7 (0.05)
Israel	31 (1.2)	568 (4.4)	37 (0.9)	513 (4.3)	32 (1.2)	471 (5.0)	10.5 (0.06)
Kuwait	31 (1.3)	490 (5.1)	42 (0.7)	440 (5.6)	27 (1.2)	410 (7.6)	10.6 (0.06)
Oman	29 (1.0)	516 (4.1)	46 (0.8)	457 (3.5)	26 (0.7)	408 (4.3)	10.6 (0.04)
United Arab Emirates	29 (0.6)	541 (2.6)	41 (0.6)	476 (2.7)	30 (0.5)	413 (2.9)	10.5 (0.03)
Qatar	28 (1.3)	527 (4.7)	39 (1.1)	480 (4.6)	33 (1.2)	427 (5.2)	10.4 (0.06)
United States	26 (0.9)	570 (5.4)	41 (0.7)	528 (4.9)	33 (0.9)	487 (4.5)	10.2 (0.04)
Norway (9)	24 (0.9)	548 (4.1)	43 (0.8)	503 (3.0)	34 (1.1)	454 (4.2)	10.1 (0.04)
Italy	23 (1.0)	536 (3.6)	50 (1.1)	501 (2.5)	27 (1.1)	471 (3.6)	10.2 (0.04)
Ireland	19 (0.9)	581 (3.7)	36 (1.1)	543 (3.1)	45 (1.3)	492 (3.3)	9.6 (0.06)
South Africa (9)	18 (0.6)	425 (4.0)	45 (0.5)	370 (3.5)	37 (0.8)	349 (3.1)	9.9 (0.03)
Singapore	17 (0.6)	652 (3.9)	37 (0.8)	621 (4.2)	46 (1.0)	581 (4.1)	9.6 (0.04)
Australia	16 (0.7)	586 (4.2)	39 (0.8)	543 (3.3)	45 (1.1)	499 (3.6)	9.6 (0.05)
England	15 (1.0)	581 (6.9)	38 (1.2)	539 (4.6)	48 (1.7)	488 (5.5)	9.4 (0.07)
New Zealand	12 (0.7)	567 (5.5)	40 (1.0)	517 (4.5)	47 (1.2)	470 (4.0)	9.5 (0.04)
Chile	12 (0.8)	511 (5.4)	45 (1.1)	469 (3.2)	43 (1.4)	445 (3.2)	9.6 (0.04)
Hong Kong SAR	11 (0.6)	566 (6.2)	38 (1.1)	527 (5.8)	50 (1.2)	472 (6.3)	9.4 (0.05)
Chinese Taipei	10 (0.5)	645 (3.5)	27 (0.7)	609 (2.7)	63 (0.9)	548 (2.1)	8.9 (0.04)
Korea, Rep. of	9 (0.5)	639 (4.9)	25 (0.9)	602 (2.9)	65 (1.1)	533 (2.2)	8.9 (0.04)
Malaysia	8 (0.4)	523 (5.0)	47 (0.9)	469 (3.7)	45 (1.1)	441 (4.0)	9.5 (0.03)
Japan	6 (0.4)	636 (3.9)	28 (0.8)	601 (2.8)	66 (0.9)	550 (2.3)	8.7 (0.04)
International Average	23 (0.2)	547 (0.9)	39 (0.2)	500 (0.8)	38 (0.2)	456 (0.9)	
Benchmarking Participants							
Dubai, UAE	32 (1.5)	588 (3.8)	44 (1.4)	546 (2.9)	25 (0.7)	500 (3.5)	10.7 (0.06)
Quebec, Canada	25 (1.1)	570 (4.2)	46 (1.1)	542 (3.7)	29 (1.5)	503 (4.9)	10.2 (0.07)
Abu Dhabi, UAE	22 (0.8)	524 (4.2)	39 (0.6)	423 (4.5)	38 (0.9)	363 (4.7)	10.2 (0.04)
Gauteng, RSA (9)	22 (1.0)	463 (5.3)	44 (0.7)	421 (4.0)	34 (1.2)	401 (5.2)	10.1 (0.05)
Ontario, Canada	21 (1.2)	561 (4.6)	43 (1.3)	527 (3.3)	36 (1.3)	493 (3.5)	10.0 (0.06)
Western Cape, RSA (9)	16 (0.8)	494 (7.3)	42 (0.9)	443 (5.5)	42 (1.2)	421 (5.1)	9.7 (0.05)

Separate Science Results

Students Confident in Biology

Biology	Very Confident in Biology		Somewhat Confident in Biology		Not Confident in Biology		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Georgia	30 (1.4)	481 (4.9)	41 (1.2)	444 (4.2)	28 (1.4)	423 (5.4)	10.4 (0.07)
Hungary	28 (1.3)	560 (3.6)	45 (1.0)	527 (3.1)	26 (1.3)	504 (4.3)	10.3 (0.07)
Cyprus	27 (1.0)	529 (2.7)	35 (1.0)	487 (3.0)	38 (1.2)	455 (2.9)	9.9 (0.06)
Lebanon	27 (1.3)	436 (7.0)	40 (1.0)	372 (5.9)	33 (1.3)	344 (5.7)	10.2 (0.07)
Romania	24 (1.2)	506 (4.7)	46 (1.1)	467 (4.6)	30 (1.4)	453 (5.5)	10.1 (0.07)
Morocco	24 (1.0)	442 (4.0)	44 (0.8)	390 (3.1)	32 (0.9)	370 (3.0)	10.1 (0.05)
Kazakhstan	24 (1.1)	502 (4.6)	55 (1.0)	476 (3.3)	21 (1.1)	458 (4.7)	10.3 (0.05)
Portugal	22 (1.1)	559 (4.1)	50 (1.1)	522 (2.8)	28 (1.3)	487 (4.1)	10.0 (0.06)
Russian Federation	21 (1.0)	559 (5.8)	51 (0.8)	546 (4.3)	28 (1.1)	526 (4.6)	10.0 (0.06)
Lithuania	19 (1.0)	567 (3.4)	49 (1.2)	533 (3.2)	32 (1.6)	517 (4.8)	9.8 (0.07)
Sweden	18 (0.9)	579 (4.9)	51 (1.0)	532 (3.7)	31 (1.2)	491 (4.4)	9.8 (0.05)
Finland	17 (0.9)	593 (3.4)	51 (0.8)	553 (3.4)	31 (1.0)	508 (4.1)	9.8 (0.05)
France	13 (0.6)	539 (4.7)	46 (1.3)	498 (3.1)	41 (1.5)	462 (3.1)	9.3 (0.06)
International Average	23 (0.3)	527 (1.3)	46 (0.3)	488 (1.0)	31 (0.4)	461 (1.2)	
Benchmarking Participants							
Moscow City, Russian Fed.	21 (1.2)	580 (3.9)	48 (1.1)	567 (3.3)	31 (1.3)	559 (4.2)	9.9 (0.06)

This TIMSS context questionnaire scale for general/integrated science was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011 where science is taught as a single subject. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution. The separate scales for biology, chemistry, physics, and Earth science were each established in 2019 using a comparable approach.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 11.12: Students Confident in Science

Students' Reports

(Continued)

Separate Science Results

Students Confident in Chemistry

Chemistry	Very Confident in Chemistry		Somewhat Confident in Chemistry		Not Confident in Chemistry		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Cyprus	38 (1.2)	518 (2.9)	36 (1.1)	484 (2.9)	25 (1.0)	446 (3.0)	11.0 (0.05)
Lebanon	31 (1.5)	428 (5.8)	40 (1.1)	368 (5.5)	30 (1.3)	346 (7.0)	10.7 (0.07)
Georgia	25 (1.3)	493 (4.7)	35 (1.1)	451 (4.7)	40 (1.5)	422 (4.4)	10.2 (0.07)
Morocco	23 (0.9)	444 (4.1)	44 (0.7)	390 (3.2)	34 (0.9)	371 (2.7)	10.4 (0.04)
Kazakhstan	20 (0.9)	511 (4.2)	46 (1.0)	479 (3.5)	34 (1.3)	460 (4.5)	10.2 (0.05)
Lithuania	18 (1.0)	579 (4.1)	40 (1.0)	538 (3.9)	42 (1.6)	513 (3.5)	9.8 (0.07)
Portugal	17 (1.0)	571 (4.6)	38 (1.3)	526 (3.2)	45 (1.8)	495 (3.3)	9.8 (0.07)
Sweden	17 (0.9)	581 (6.3)	42 (1.1)	537 (3.9)	41 (1.3)	493 (3.8)	9.9 (0.05)
Russian Federation	17 (0.8)	577 (5.1)	36 (0.9)	550 (4.7)	48 (1.1)	527 (4.4)	9.7 (0.05)
Romania	16 (1.0)	521 (5.7)	33 (1.1)	478 (5.0)	51 (1.5)	454 (4.7)	9.6 (0.06)
Finland	15 (0.9)	613 (3.1)	36 (0.9)	562 (3.5)	48 (1.2)	515 (3.2)	9.6 (0.05)
Hungary	14 (0.8)	575 (5.5)	35 (1.1)	530 (3.0)	51 (1.5)	518 (3.4)	9.5 (0.07)
France	12 (0.8)	549 (4.4)	38 (1.1)	501 (3.6)	49 (1.6)	465 (2.9)	9.5 (0.06)
International Average	20 (0.3)	535 (1.3)	39 (0.3)	492 (1.1)	41 (0.4)	463 (1.1)	
Benchmarking Participants							
Moscow City, Russian Fed.	15 (0.9)	598 (4.3)	34 (0.9)	575 (3.1)	50 (1.3)	552 (3.3)	9.5 (0.06)

Students Confident in Physics

Physics	Very Confident in Physics		Somewhat Confident in Physics		Not Confident in Physics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Lebanon	25 (1.3)	435 (5.9)	38 (0.9)	372 (5.7)	36 (1.4)	352 (6.0)	10.6 (0.07)
Cyprus	24 (1.0)	533 (3.3)	31 (1.0)	491 (2.8)	45 (1.2)	460 (3.0)	10.1 (0.06)
Morocco	23 (0.9)	443 (4.1)	44 (0.7)	390 (2.9)	33 (0.9)	374 (3.1)	10.6 (0.04)
Kazakhstan	19 (0.9)	512 (5.2)	49 (1.0)	478 (3.3)	32 (1.2)	461 (4.1)	10.3 (0.05)
Hungary	18 (1.0)	582 (4.5)	37 (1.0)	534 (3.2)	45 (1.5)	506 (3.3)	10.0 (0.06)
Georgia	18 (1.1)	497 (5.3)	36 (1.1)	456 (5.0)	46 (1.4)	427 (4.0)	10.0 (0.06)
Portugal	17 (1.0)	571 (4.6)	38 (1.3)	526 (3.2)	45 (1.8)	495 (3.3)	10.0 (0.08)
Russian Federation	17 (0.8)	572 (6.2)	45 (1.0)	548 (3.7)	38 (1.1)	526 (4.9)	10.2 (0.04)
Sweden	16 (0.9)	592 (5.3)	43 (0.9)	541 (3.6)	42 (1.1)	491 (3.9)	10.0 (0.04)
Finland	13 (0.7)	613 (3.6)	35 (1.0)	560 (3.9)	52 (1.3)	516 (3.7)	9.6 (0.05)
France	12 (0.8)	549 (4.4)	38 (1.1)	501 (3.6)	50 (1.6)	465 (2.9)	9.6 (0.06)
Romania	12 (0.7)	529 (6.2)	34 (1.1)	476 (5.2)	54 (1.3)	458 (4.3)	9.6 (0.05)
Lithuania	11 (0.7)	589 (4.8)	32 (1.1)	543 (3.5)	57 (1.5)	520 (3.5)	9.4 (0.06)
International Average	17 (0.3)	540 (1.4)	38 (0.3)	494 (1.1)	44 (0.4)	465 (1.1)	
Benchmarking Participants							
Moscow City, Russian Fed.	17 (0.9)	601 (4.2)	41 (0.9)	573 (3.4)	42 (1.2)	547 (3.1)	10.0 (0.05)

Students Confident in Earth Science

Earth Science	Very Confident in Earth Science		Somewhat Confident in Earth Science		Not Confident in Earth Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Cyprus	30 (1.0)	522 (2.8)	37 (1.1)	489 (2.9)	33 (1.1)	456 (3.3)	10.2 (0.05)
Georgia	25 (1.5)	493 (4.5)	42 (1.3)	451 (4.4)	33 (1.7)	418 (5.3)	10.1 (0.07)
Hungary	25 (1.2)	563 (4.1)	42 (1.0)	526 (3.0)	33 (1.4)	510 (3.5)	10.0 (0.08)
Romania	24 (1.6)	509 (6.4)	46 (1.2)	470 (5.9)	31 (1.8)	450 (6.8)	10.2 (0.08)
Russian Federation	23 (0.8)	560 (5.1)	51 (0.9)	546 (3.9)	26 (0.9)	524 (5.2)	10.2 (0.04)
Kazakhstan	23 (1.0)	505 (4.7)	54 (1.0)	477 (3.5)	22 (1.0)	454 (4.9)	10.2 (0.05)
Portugal	22 (1.1)	559 (4.1)	50 (1.1)	522 (2.8)	28 (1.3)	487 (4.1)	10.0 (0.06)
Lithuania	21 (1.1)	564 (3.6)	45 (1.1)	534 (3.2)	34 (1.5)	516 (4.1)	9.9 (0.07)
Morocco	21 (0.9)	440 (4.2)	43 (0.7)	393 (3.2)	35 (0.8)	376 (2.8)	10.0 (0.05)
Finland	18 (0.8)	588 (3.5)	50 (0.9)	554 (3.2)	31 (1.1)	508 (4.0)	9.9 (0.04)
France	13 (0.6)	539 (4.6)	46 (1.3)	498 (3.1)	41 (1.5)	462 (3.1)	9.4 (0.06)
Lebanon	--	--	--	--	--	--	--
Sweden	--	--	--	--	--	--	--
International Average	22 (0.3)	531 (1.3)	46 (0.3)	496 (1.1)	32 (0.4)	469 (1.3)	
Benchmarking Participants							
Moscow City, Russian Fed.	24 (1.2)	584 (4.5)	49 (1.0)	568 (3.0)	27 (1.2)	551 (4.2)	10.1 (0.06)

A dash (-) indicates comparable data not available.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Students Value Mathematics and Science

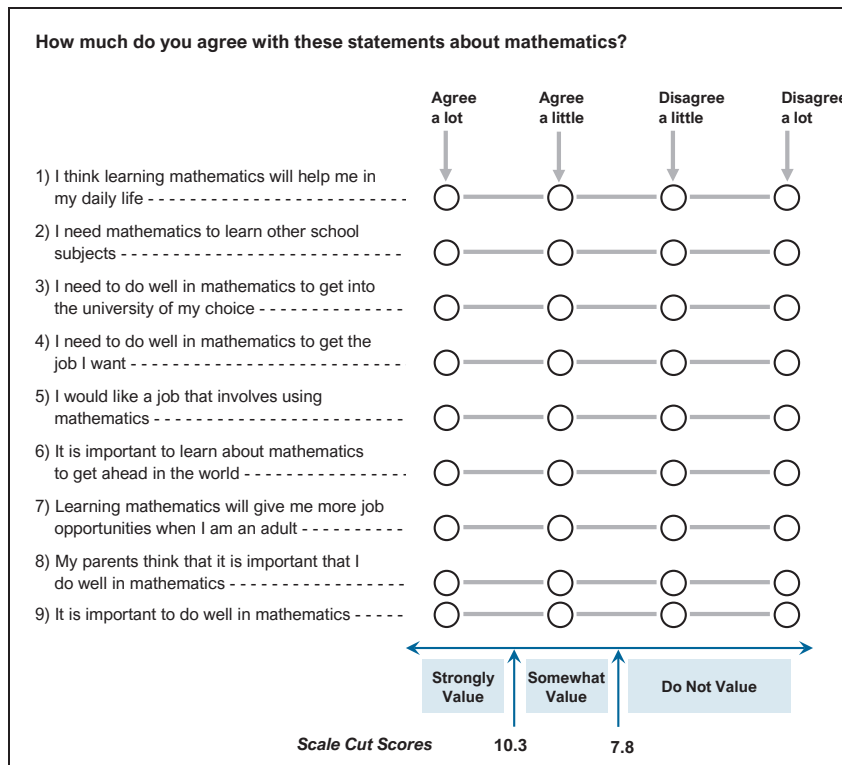
Exhibits 11.13 and 11.15 present the two parallel scales: *Students Value Mathematics* and *Students Value Science*, respectively (see About the Scale). The TIMSS 2019 context questionnaire framework cites research showing that if students understand the value of learning these subjects, it may ameliorate some of their other negative attitudes.

Exhibit 11.14 shows that eighth grade students generally value mathematics. Thirty-seven percent responded that they “strongly value” mathematics, 47 percent responded “somewhat value,” and only 16 percent responded “do not value.” The results were similar, but slightly less positive for science, shown in Exhibit 11.16—36 percent “strongly value,” 42 percent “somewhat value,” and 22 percent “do not value” science. There was a strong positive relationship between valuing mathematics and science and average achievement in each of the respective curriculum areas. However, the relationship between higher achievement and valuing the subjects was less pronounced than between higher achievement and attitudes toward liking the subjects or having confidence in your ability to do well in the subjects.

Exhibit 11.13: Students Value Mathematics
Students' Reports

About the Scale

Students were scored according to their responses to nine statements on the *Students Value Mathematics* scale. Cut scores divide the scale into three categories. Students who **Strongly Value Mathematics** had a score at or above the cut score corresponding to “agreeing a lot” with five of the nine statements and “agreeing a little” with the other four, on average. Students who **Do Not Value Mathematics** had a score at or below the cut score corresponding to “disagreeing a little” with five of the nine statements and “agreeing a little” with the other four, on average. All other students **Somewhat Value Mathematics**.



SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Exhibit 11.14: Students Value Mathematics
Students' Reports

Country	Strongly Value Mathematics		Somewhat Value Mathematics		Do Not Value Mathematics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
South Africa (9)	68 (0.6)	399 (2.2)	27 (0.6)	377 (2.7)	5 (0.2)	357 (4.1)	10.9 (0.03)
Egypt	63 (1.2)	425 (5.3)	31 (0.9)	403 (5.5)	6 (0.5)	381 (9.3)	10.9 (0.06)
Jordan	62 (1.2)	433 (3.6)	31 (1.0)	411 (5.4)	7 (0.5)	384 (8.8)	10.8 (0.05)
Morocco	60 (0.9)	400 (2.7)	32 (0.7)	374 (2.4)	8 (0.4)	368 (3.8)	10.7 (0.04)
Israel	54 (1.2)	529 (4.9)	37 (1.0)	514 (4.6)	9 (0.5)	501 (6.5)	10.4 (0.05)
Oman	53 (0.9)	432 (3.0)	39 (0.8)	397 (3.5)	8 (0.4)	375 (5.8)	10.3 (0.04)
Iran, Islamic Rep. of	49 (1.2)	457 (4.4)	40 (1.0)	440 (3.9)	11 (0.6)	426 (6.2)	10.2 (0.05)
Turkey	48 (1.2)	520 (4.9)	40 (0.8)	480 (4.7)	12 (0.8)	454 (6.4)	10.1 (0.06)
Georgia	47 (1.3)	474 (4.8)	43 (1.2)	455 (4.8)	10 (0.8)	436 (9.3)	10.1 (0.06)
United Arab Emirates	47 (0.6)	492 (2.7)	41 (0.6)	468 (1.8)	12 (0.3)	431 (3.4)	10.1 (0.03)
Saudi Arabia	46 (1.1)	403 (3.3)	42 (0.8)	391 (2.7)	12 (0.6)	380 (4.5)	10.1 (0.05)
Lebanon	45 (1.3)	447 (3.0)	43 (1.0)	422 (4.0)	12 (0.8)	409 (5.5)	10.0 (0.06)
Kuwait	41 (1.2)	416 (5.8)	43 (0.9)	401 (5.0)	16 (0.7)	384 (5.8)	9.7 (0.05)
Bahrain	40 (0.9)	493 (2.6)	44 (0.6)	479 (2.4)	16 (0.8)	459 (3.2)	9.7 (0.04)
United States	40 (0.8)	532 (5.0)	48 (0.7)	516 (4.7)	12 (0.5)	484 (6.1)	9.8 (0.04)
Qatar	38 (1.1)	456 (5.7)	44 (1.1)	449 (4.5)	18 (1.1)	409 (4.8)	9.6 (0.06)
Australia	38 (0.9)	539 (4.5)	48 (0.8)	514 (3.8)	14 (0.6)	479 (4.8)	9.7 (0.04)
England	38 (1.2)	528 (6.1)	51 (0.9)	515 (5.6)	10 (0.7)	500 (7.3)	9.8 (0.05)
New Zealand	37 (1.0)	494 (4.2)	50 (0.9)	481 (3.6)	14 (0.7)	461 (5.1)	9.6 (0.05)
Cyprus	37 (1.0)	523 (2.8)	46 (0.9)	499 (2.2)	17 (0.7)	467 (3.9)	9.6 (0.04)
Ireland	35 (1.0)	538 (3.5)	49 (0.9)	525 (2.6)	16 (0.7)	496 (4.3)	9.5 (0.04)
Chile	35 (1.0)	446 (3.5)	53 (1.0)	442 (3.1)	12 (0.6)	425 (5.2)	9.7 (0.04)
Romania	35 (1.3)	502 (5.6)	43 (1.0)	472 (4.8)	22 (1.3)	461 (4.9)	9.4 (0.07)
Norway (9)	35 (1.0)	524 (3.4)	51 (0.9)	503 (2.4)	15 (0.7)	467 (4.4)	9.6 (0.05)
Malaysia	34 (1.0)	486 (3.3)	56 (0.9)	453 (3.7)	10 (0.8)	421 (5.6)	9.6 (0.04)
Portugal	34 (1.1)	525 (4.8)	48 (1.3)	493 (3.1)	17 (1.0)	473 (4.0)	9.5 (0.05)
Singapore	34 (0.8)	628 (4.8)	56 (0.8)	614 (4.1)	10 (0.4)	584 (6.3)	9.6 (0.03)
Kazakhstan	31 (1.0)	493 (4.6)	53 (0.9)	487 (3.6)	15 (0.8)	482 (5.1)	9.5 (0.05)
France	27 (0.9)	493 (3.8)	57 (1.0)	485 (2.7)	16 (0.7)	458 (3.8)	9.3 (0.04)
Russian Federation	26 (1.0)	560 (6.1)	53 (0.9)	543 (4.5)	21 (1.0)	526 (5.0)	9.2 (0.05)
Lithuania	26 (1.2)	533 (4.7)	56 (1.1)	520 (3.2)	19 (0.9)	508 (4.3)	9.2 (0.04)
Hungary	25 (0.9)	543 (5.5)	53 (0.9)	516 (3.4)	22 (0.8)	489 (3.8)	9.1 (0.04)
Italy	25 (0.8)	511 (4.0)	54 (0.9)	498 (2.9)	21 (0.8)	482 (3.6)	9.1 (0.04)
Finland	24 (0.9)	535 (3.3)	54 (0.8)	513 (2.5)	22 (0.9)	473 (3.7)	9.0 (0.04)
Sweden	24 (0.9)	515 (4.1)	58 (0.8)	505 (2.7)	18 (0.7)	487 (3.5)	9.2 (0.04)
Hong Kong SAR	18 (1.0)	605 (6.3)	54 (1.0)	586 (4.3)	28 (0.9)	547 (5.2)	8.7 (0.05)
Korea, Rep. of	14 (0.6)	668 (5.0)	56 (0.9)	620 (2.9)	30 (1.1)	554 (3.1)	8.5 (0.04)
Japan	14 (0.7)	629 (5.7)	59 (0.8)	598 (2.7)	27 (0.8)	568 (3.7)	8.6 (0.03)
Chinese Taipei	12 (0.5)	659 (5.8)	48 (0.8)	634 (3.1)	40 (1.0)	573 (3.0)	8.2 (0.04)
International Average	37 (0.2)	507 (0.7)	47 (0.1)	487 (0.6)	16 (0.1)	462 (0.8)	
Benchmarking Participants							
Gauteng, RSA (9)	69 (1.1)	423 (3.0)	27 (0.9)	416 (3.9)	4 (0.4)	423 (7.6)	10.9 (0.04)
Western Cape, RSA (9)	63 (1.0)	444 (4.6)	31 (0.8)	441 (5.2)	5 (0.5)	438 (8.7)	10.7 (0.04)
Ontario, Canada	51 (1.4)	545 (5.4)	42 (1.2)	521 (4.3)	8 (0.6)	487 (6.6)	10.3 (0.05)
Dubai, UAE	47 (1.1)	549 (3.0)	43 (1.0)	531 (2.4)	10 (0.4)	499 (3.8)	10.1 (0.04)
Abu Dhabi, UAE	42 (0.8)	462 (3.6)	44 (0.7)	429 (3.3)	14 (0.6)	394 (4.9)	9.8 (0.05)
Quebec, Canada	37 (1.3)	556 (3.9)	52 (1.1)	541 (3.9)	11 (0.8)	513 (6.6)	9.7 (0.05)
Moscow City, Russian Fed.	25 (0.9)	606 (5.7)	50 (0.9)	575 (4.3)	25 (1.0)	546 (4.4)	9.1 (0.04)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

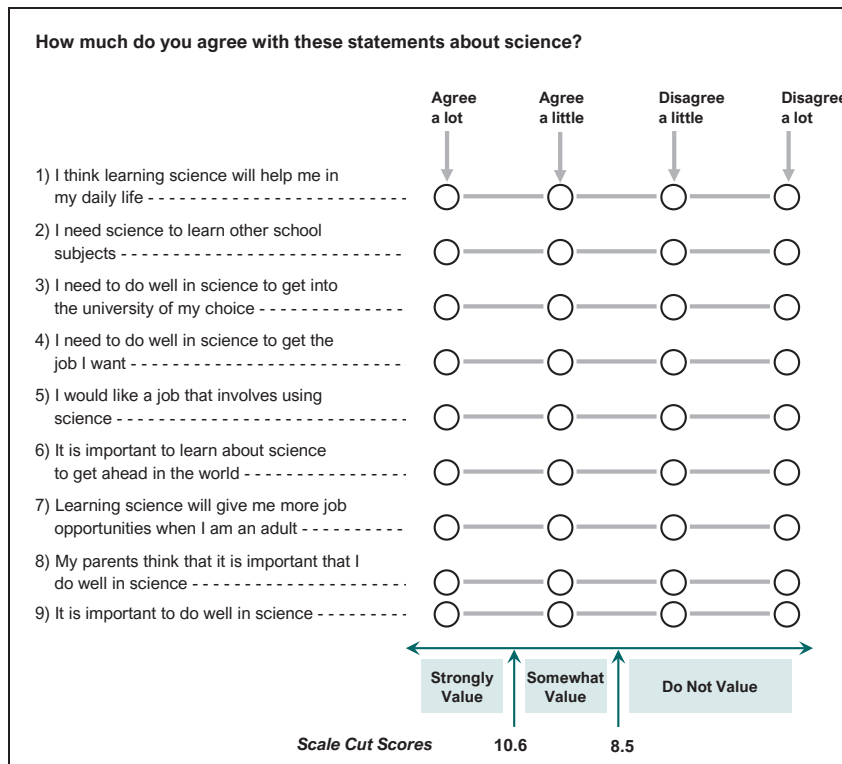
() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
Downloaded from <http://timss2019.org/download>

Exhibit 11.15: Students Value Science
Students' Reports

About the Scale

Students were scored according to their responses to nine statements on the *Students Value Science* scale. Cut scores divide the scale into three categories. Students who **Strongly Value Science** had a score at or above the cut score corresponding to “agreeing a lot” with five of the nine statements and “agreeing a little” with the other four, on average. Students who **Do Not Value Science** had a score at or below the cut score corresponding to “disagreeing a little” with five of the nine statements and “agreeing a little” with the other four, on average. All other students **Somewhat Value Science**.



SOURCE: IEA's Trends in International Mathematics and Science Study TIMSS 2019
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Exhibit 11.16: Students Value Science
Students' Reports

Country	Strongly Value Science		Somewhat Value Science		Do Not Value Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Egypt	67 (1.1)	412 (5.2)	26 (0.9)	362 (6.7)	7 (0.5)	344 (7.8)	11.3 (0.05)
Jordan	64 (1.2)	468 (4.4)	29 (0.9)	438 (4.8)	7 (0.5)	418 (8.6)	11.2 (0.05)
Oman	57 (0.9)	483 (3.0)	35 (0.8)	440 (3.7)	8 (0.6)	409 (7.9)	10.8 (0.04)
Iran, Islamic Rep. of	57 (1.2)	462 (4.3)	33 (1.0)	434 (3.8)	11 (0.6)	436 (7.3)	10.8 (0.05)
United Arab Emirates	55 (0.7)	501 (2.6)	34 (0.6)	453 (2.8)	11 (0.3)	417 (4.4)	10.7 (0.02)
Saudi Arabia	55 (1.3)	442 (3.3)	34 (0.9)	427 (3.4)	11 (0.7)	414 (4.5)	10.7 (0.06)
Kuwait	54 (1.2)	460 (5.5)	34 (1.1)	439 (5.9)	12 (0.7)	419 (7.3)	10.7 (0.05)
South Africa (9)	54 (0.7)	380 (3.5)	34 (0.5)	353 (3.1)	12 (0.4)	387 (4.4)	10.6 (0.03)
Bahrain	51 (0.9)	507 (1.8)	36 (0.7)	479 (3.5)	13 (0.6)	445 (5.9)	10.5 (0.04)
Morocco	49 (0.9)	409 (2.7)	39 (0.7)	383 (3.2)	12 (0.6)	386 (4.0)	10.5 (0.03)
Qatar	49 (1.0)	495 (5.4)	37 (0.8)	467 (5.0)	15 (0.9)	436 (5.8)	10.4 (0.05)
Lebanon	49 (1.1)	404 (5.3)	39 (0.9)	360 (5.0)	12 (0.6)	350 (9.2)	10.5 (0.04)
Turkey	46 (1.2)	529 (4.1)	38 (0.8)	506 (4.4)	15 (0.9)	499 (5.8)	10.3 (0.05)
Malaysia	45 (1.2)	492 (3.0)	46 (0.9)	445 (4.2)	9 (0.7)	384 (6.9)	10.4 (0.04)
Georgia	43 (1.2)	457 (4.2)	43 (1.1)	445 (4.3)	14 (0.9)	430 (5.6)	10.3 (0.05)
Singapore	42 (1.0)	632 (3.5)	48 (0.8)	598 (4.1)	11 (0.6)	557 (6.3)	10.3 (0.03)
United States	36 (0.9)	540 (5.9)	43 (0.7)	526 (4.7)	21 (0.6)	503 (4.3)	9.9 (0.03)
Israel	36 (1.3)	531 (5.2)	36 (0.9)	518 (4.7)	29 (1.2)	498 (5.6)	9.7 (0.06)
England	33 (1.1)	540 (5.3)	45 (1.1)	523 (5.6)	22 (1.0)	491 (5.5)	9.8 (0.05)
Cyprus	33 (1.0)	510 (2.9)	43 (1.2)	485 (2.5)	24 (0.9)	458 (3.4)	9.7 (0.04)
Russian Federation	32 (1.0)	548 (4.8)	50 (0.8)	540 (4.7)	18 (0.9)	545 (4.5)	9.9 (0.04)
Romania	31 (1.3)	487 (5.3)	41 (1.1)	468 (4.6)	28 (1.2)	462 (4.5)	9.6 (0.06)
Kazakhstan	30 (1.0)	487 (4.0)	51 (0.9)	477 (3.4)	19 (0.8)	471 (5.1)	9.9 (0.04)
Australia	28 (0.9)	561 (4.1)	42 (0.6)	530 (3.5)	29 (0.8)	501 (3.1)	9.5 (0.04)
Portugal	27 (1.1)	542 (4.2)	44 (1.1)	517 (3.4)	28 (1.1)	503 (3.0)	9.6 (0.05)
Lithuania	27 (1.0)	549 (4.3)	51 (1.1)	531 (3.4)	21 (0.8)	526 (4.0)	9.7 (0.03)
New Zealand	26 (0.9)	520 (5.0)	47 (0.8)	503 (3.9)	28 (1.0)	479 (4.2)	9.5 (0.04)
Chile	25 (0.9)	471 (3.8)	48 (0.8)	462 (3.4)	27 (1.0)	459 (3.9)	9.5 (0.04)
Ireland	25 (1.0)	555 (3.9)	42 (1.1)	534 (2.8)	33 (1.1)	500 (3.7)	9.3 (0.05)
Hong Kong SAR	23 (0.9)	526 (7.6)	49 (1.1)	509 (5.5)	29 (1.1)	478 (6.4)	9.4 (0.05)
Norway (9)	21 (0.9)	516 (5.4)	48 (0.9)	501 (3.1)	31 (1.1)	478 (4.4)	9.3 (0.04)
Hungary	21 (1.1)	553 (4.8)	47 (0.9)	527 (3.5)	33 (1.1)	519 (3.0)	9.3 (0.05)
Sweden	20 (0.9)	541 (5.7)	48 (1.1)	527 (3.9)	32 (1.0)	510 (3.6)	9.3 (0.03)
Italy	19 (0.8)	515 (4.0)	45 (1.0)	506 (2.9)	35 (1.1)	487 (2.9)	9.2 (0.04)
France	19 (0.8)	516 (4.5)	47 (0.9)	496 (3.2)	34 (1.1)	465 (2.7)	9.2 (0.04)
Finland	18 (0.9)	586 (4.3)	48 (0.9)	550 (3.2)	35 (1.1)	514 (3.0)	9.1 (0.04)
Korea, Rep. of	16 (0.7)	611 (4.2)	50 (0.9)	573 (2.6)	34 (1.1)	519 (2.7)	9.1 (0.04)
Chinese Taipei	14 (0.7)	609 (4.4)	41 (0.8)	589 (2.5)	45 (1.0)	551 (2.4)	8.9 (0.04)
Japan	11 (0.6)	598 (4.9)	48 (1.0)	581 (2.5)	41 (1.1)	550 (2.5)	8.8 (0.04)
International Average	36 (0.2)	511 (0.7)	42 (0.1)	487 (0.6)	22 (0.1)	467 (0.8)	
Benchmarking Participants							
Dubai, UAE	56 (1.0)	563 (2.6)	34 (0.9)	535 (3.2)	10 (0.5)	505 (6.1)	10.8 (0.04)
Gauteng, RSA (9)	53 (1.2)	424 (4.1)	31 (0.7)	411 (4.6)	15 (0.8)	448 (6.3)	10.5 (0.05)
Abu Dhabi, UAE	49 (1.1)	461 (4.1)	38 (0.9)	396 (4.4)	13 (0.7)	358 (7.3)	10.5 (0.05)
Western Cape, RSA (9)	42 (1.2)	446 (6.4)	38 (0.8)	432 (5.7)	19 (0.9)	456 (5.7)	10.1 (0.05)
Ontario, Canada	38 (1.0)	540 (4.5)	43 (1.0)	519 (3.3)	19 (1.1)	495 (4.9)	10.0 (0.04)
Quebec, Canada	32 (1.3)	558 (4.0)	45 (1.0)	538 (3.6)	24 (1.3)	508 (4.9)	9.7 (0.06)
Moscow City, Russian Fed.	24 (1.0)	570 (3.7)	46 (0.9)	565 (3.7)	30 (1.1)	567 (3.6)	9.4 (0.05)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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