

Chapter 4

Students' Backgrounds and Attitudes Towards Mathematics

With its overarching goal of improving student learning in mathematics and science, TIMSS focuses primarily on curricular, instructional, and school resource factors in presenting information on the context in which learning takes place. However, as documented extensively by previous IEA studies of mathematics achievement,¹ student achievement also is related to home background factors, and to students' activities and attitudes. Since information on such factors is indispensable for interpreting the achievement results, this chapter provides detailed information about students' home backgrounds and resources for learning, how they spend their time out of school, their self-confidence in learning mathematics, and the value they place on mathematics. Also provided is information on trends in attitudes to learning mathematics across 1995, 1999, and 2003.

What Educational Resources Do Students Have in Their Homes?

IEA's ongoing assessments of student achievement in mathematics and science (TIMSS) and reading literacy (PIRLS) have shown that in almost every country students from homes with extensive educational resources have higher achievement in mathematics and other subjects

¹ For results from TIMSS 1999, see Mullis, I.V.S., Martin, M.O., Gonzalez, E.J., Gregory, K.D., Garden, R.A., O'Connor, K.M., Chrostowski, S.J., and Smith, T.A., (2000), *TIMSS 1999 International Mathematics Report: Findings from IEA's Repeat of the Third International Mathematics and Science Study at the Eighth Grade*, Chestnut Hill, MA: Boston College. For TIMSS 1995 results, see Beaton, A.E., Mullis, I.V.S., Martin, M.O., Gonzalez, E.J., Kelly, D.L., and Smith, T.A. (1996), *Mathematics Achievement in the Middle School Years: IEA's Third International Mathematics and Science Study*, Chestnut Hill, MA: Boston College;

than those from less advantaged backgrounds. For the 2003 data presented in this report, TIMSS has focused on just a few central variables: level of parental education, students' educational aspirations, speaking the language of the test at home, having a range of study aids in the home, and computer use at home and at school.

Because for most children, parents are their first and probably most important educators, the level of education of the parents may be the most important educational resource in the home. Exhibit 4.1 summarizes eighth-grade students' reports of the highest level of education attained by their parents. Ordered alphabetically by country, this two-page display shows the percentages of students in each of five categories of parents' educational level, together with their average mathematics achievement. Standard errors for percentages and averages also are shown. The education level of the parent with most education was used in assigning students to categories.

Although response rates to questions in the TIMSS questionnaires generally were high, students in some countries had difficulty in answering specific questions, particularly those about their parents' level of education. The exhibits in this chapter have special notations on this point. For a country where responses are available for at least 70 but less than 85 percent of the students, an “r” is included next to its data. Where responses are available for at least 50 but less than 70 percent of the students, an “s” is included. Where responses are available for less than 50 percent, an “x” replaces the data.

Exhibit 4.1 reveals great diversity in levels of parental education within and across the TIMSS countries. On average across countries, the percentages of eighth-grade students reporting that the highest level of education attained by either parent was as follows: finished university – 28%; finished post-secondary education but not university – 17%; finished upper secondary – 28%; finished lower secondary – 15%; and no more than primary (includes not attending school at all) – 12%. Countries with the highest percentages (40% or more) of students reporting university-educated parents included Armenia, Estonia,

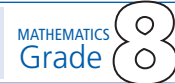
Israel, Japan, Latvia, Norway, the Russian Federation, Sweden, and the United States. Among benchmarking participants, Indiana and Ontario were included. In contrast, countries reporting the highest percentages (40% or more) of parents with no more than primary education included Botswana, Iran, Morocco, Saudi Arabia, and Tunisia.

The different educational approaches, structures, and organizations across the TIMSS countries make comparisons of educational levels difficult, and this is exacerbated by high levels of 'do not know' and missing responses in some countries. Nonetheless, Exhibit 4.1 makes it clear that higher levels of parents' education are associated with higher eighth-grade student achievement in mathematics in almost all countries. At 503 score points, the average mathematics achievement of students with university-educated parents was more than 90 points greater than the average of students whose parents had no more than primary education.

As shown in Exhibit 4.2, students generally had high expectations for university education, particularly those who had a parent with a university education. More than half the eighth-grade students (54% on average across countries) reported that they expect to finish university, 30 percent do not expect to complete a university education, and a further 15 percent do not know. Students expecting to finish university had substantially greater average mathematics achievement than those without university expectations. Among those expecting to finish university, the average achievement of those students with a parent who finished university (21% of students) was 30 points greater than those without a university-educated parent (33%).

Although speaking more than one language has advantages, TIMSS 1999 showed that, with some exceptions, countries with large proportions of students from homes where the language of the test (and consequently the language of instruction) is not often spoken had lower average mathematics achievement at eighth grade than those who spoke it more often. Exhibit 4.3, which presents students' reports of how frequently they spoke the language of the TIMSS test at home

Exhibit 4.1: Highest Level of Education of Either Parent*



Countries	Finished University or Equivalent or Higher		Finished Post-secondary Vocational/Technical Education but Not University		Finished Upper Secondary Schooling	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	51 (1.5)	492 (3.6)	22 (0.9)	473 (4.4)	24 (1.1)	467 (4.0)
Australia	r 29 (1.3)	543 (5.6)	27 (1.0)	517 (5.8)	25 (1.1)	493 (6.1)
Bahrain	33 (0.7)	427 (2.5)	7 (0.5)	410 (5.7)	23 (0.6)	409 (2.9)
Belgium (Flemish)	s 25 (1.4)	568 (3.9)	26 (1.0)	565 (3.0)	31 (1.1)	535 (3.5)
Botswana	10 (0.7)	411 (7.1)	14 (0.6)	378 (4.0)	16 (0.8)	361 (3.5)
Bulgaria	28 (1.3)	516 (6.2)	36 (1.4)	475 (4.7)	29 (1.4)	457 (5.3)
Chile	16 (1.0)	465 (4.7)	10 (0.5)	418 (5.5)	32 (1.1)	391 (3.7)
Chinese Taipei	17 (1.4)	643 (5.1)	11 (0.6)	618 (5.3)	46 (1.0)	583 (4.3)
Cyprus	28 (0.8)	486 (2.6)	14 (0.7)	475 (3.0)	36 (0.9)	459 (2.8)
Egypt	24 (1.1)	464 (4.5)	0 (0.0)	~ ~	11 (0.6)	433 (5.7)
Estonia	40 (1.4)	555 (3.4)	39 (1.1)	525 (3.3)	19 (0.7)	512 (3.8)
Ghana	10 (0.7)	320 (8.1)	17 (0.9)	296 (6.7)	22 (1.0)	292 (5.8)
Hong Kong, SAR	12 (1.0)	612 (7.0)	12 (0.5)	598 (5.2)	36 (0.9)	587 (3.0)
Hungary	r 37 (1.6)	573 (3.4)	0 (0.0)	~ ~	49 (1.6)	515 (3.0)
Indonesia	9 (0.9)	457 (8.4)	6 (0.5)	433 (7.7)	24 (1.1)	422 (5.9)
Iran, Islamic Rep. of	10 (0.8)	456 (6.6)	10 (0.7)	429 (5.2)	15 (0.8)	434 (4.2)
Israel	r 45 (1.3)	531 (3.7)	24 (0.9)	493 (4.0)	18 (0.9)	474 (4.9)
Italy	21 (1.3)	509 (5.6)	5 (0.4)	500 (6.4)	40 (0.9)	495 (3.1)
Japan	r 45 (1.4)	601 (2.9)	18 (0.7)	569 (3.8)	36 (1.1)	548 (2.5)
Jordan	35 (1.8)	458 (6.8)	15 (0.8)	439 (4.8)	30 (1.0)	419 (3.3)
Korea, Rep. of	35 (1.2)	619 (3.0)	15 (0.6)	589 (3.6)	41 (1.0)	580 (2.2)
Latvia	r 43 (1.8)	532 (4.0)	0 (0.0)	~ ~	34 (1.4)	512 (4.2)
Lebanon	19 (1.2)	465 (4.8)	21 (1.0)	448 (4.5)	19 (0.7)	436 (4.4)
Lithuania	r 36 (1.6)	538 (2.9)	31 (1.0)	502 (3.2)	30 (1.3)	473 (3.3)
Macedonia, Rep. of	22 (1.3)	479 (5.4)	19 (0.9)	459 (3.9)	43 (1.2)	435 (3.6)
Malaysia	11 (0.9)	544 (7.4)	20 (0.9)	522 (4.9)	27 (0.9)	519 (4.6)
Moldova, Rep. of	34 (1.4)	485 (4.0)	18 (1.0)	463 (5.5)	21 (1.1)	457 (5.1)
Morocco	r 16 (1.3)	406 (4.8)	0 (0.0)	~ ~	17 (0.8)	398 (5.3)
Netherlands	r 22 (1.6)	569 (5.7)	32 (1.3)	563 (4.2)	43 (1.9)	526 (4.3)
New Zealand	s 28 (1.9)	535 (8.0)	30 (1.5)	502 (6.3)	34 (1.9)	492 (5.3)
Norway	s 66 (1.4)	485 (2.6)	16 (1.0)	459 (5.7)	12 (0.9)	451 (4.9)
Palestinian Nat'l Auth.	27 (0.9)	426 (4.5)	12 (0.5)	401 (6.1)	36 (0.8)	396 (3.3)
Philippines	19 (1.2)	425 (8.5)	22 (0.8)	394 (5.4)	33 (0.9)	372 (5.8)
Romania	17 (1.8)	533 (5.7)	16 (1.0)	493 (5.8)	47 (1.5)	479 (4.2)
Russian Federation	44 (2.3)	530 (3.6)	26 (1.5)	513 (3.7)	24 (1.2)	484 (4.8)
Saudi Arabia	27 (1.9)	363 (6.3)	0 (0.0)	~ ~	12 (0.5)	339 (7.6)
Scotland	x x	x x	x x	x x	x x	x x
Serbia	20 (1.2)	529 (4.0)	68 (1.2)	475 (2.4)	2 (0.2)	~ ~
Singapore	r 16 (0.6)	651 (3.3)	4 (0.3)	624 (5.9)	21 (0.8)	621 (3.6)
Slovak Republic	r 34 (1.9)	549 (3.8)	0 (0.0)	~ ~	65 (1.9)	502 (3.4)
Slovenia	r 26 (1.3)	522 (3.5)	31 (0.8)	498 (2.9)	34 (1.1)	486 (3.5)
South Africa	r 11 (1.0)	352 (16.6)	13 (0.7)	294 (10.0)	30 (0.9)	266 (6.0)
Sweden	s 48 (1.8)	525 (3.5)	18 (1.1)	513 (3.9)	22 (1.3)	489 (4.6)
Tunisia	11 (0.9)	437 (5.8)	12 (0.8)	437 (4.1)	16 (0.6)	419 (3.7)
United States	r 56 (1.3)	530 (3.6)	9 (0.4)	495 (3.6)	26 (0.9)	488 (3.0)
‡ England	x x	x x	x x	x x	x x	x x
International Avg.	28 (0.2)	503 (0.9)	17 (0.1)	480 (0.9)	28 (0.2)	463 (0.7)
Benchmarking Participants						
Basque Country, Spain	34 (2.1)	508 (4.0)	14 (1.1)	492 (4.2)	21 (1.1)	482 (4.1)
Indiana State, US	r 46 (2.1)	529 (7.4)	10 (0.8)	505 (4.6)	33 (1.3)	505 (5.4)
Ontario Province, Can.	s 46 (2.3)	552 (3.8)	37 (1.6)	517 (3.2)	13 (1.1)	510 (4.8)
Quebec Province, Can.	r 33 (1.6)	562 (4.7)	34 (0.9)	547 (4.0)	21 (1.1)	529 (2.7)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

* Based on countries' categorizations to UNESCO's International Standard Classification of Education (Operational Manual for ISCED-1997).

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals 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. An "s" indicates data are available for at least 50 but less than 70% of the students. An "x" indicates data are available for less than 50% of the students.



Exhibit 4.1: Highest Level of Education of Either Parent*

Countries	Finished Lower Secondary Schooling		No More Than Primary Schooling	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	2 (0.4)	~ ~	1 (0.2)	~ ~
Australia	r 15 (0.9)	482 (5.2)	3 (0.4)	429 (13.3)
Bahrain	20 (0.7)	387 (3.6)	17 (0.7)	385 (3.5)
Belgium (Flemish)	s 11 (0.7)	524 (5.8)	6 (0.7)	462 (12.7)
Botswana	20 (0.8)	366 (3.1)	41 (1.2)	356 (3.0)
Bulgaria	6 (0.7)	443 (11.5)	2 (0.4)	~ ~
Chile	31 (1.0)	354 (3.2)	11 (0.9)	334 (5.3)
Chinese Taipei	21 (1.1)	553 (5.6)	6 (0.5)	537 (7.8)
Cyprus	15 (0.7)	430 (4.0)	7 (0.4)	412 (6.1)
Egypt	29 (0.9)	398 (4.0)	36 (1.4)	387 (3.7)
Estonia	2 (0.3)	~ ~	0 (0.1)	~ ~
Ghana	37 (1.2)	261 (5.7)	14 (1.0)	246 (5.5)
Hong Kong, SAR	25 (0.8)	586 (3.5)	15 (0.7)	578 (5.0)
Hungary	r 14 (1.3)	473 (7.2)	0 (0.1)	~ ~
Indonesia	22 (0.9)	392 (7.5)	39 (1.6)	406 (5.1)
Iran, Islamic Rep. of	22 (0.8)	408 (2.8)	43 (1.6)	395 (2.6)
Israel	r 8 (0.6)	457 (7.9)	5 (0.6)	455 (11.1)
Italy	30 (1.1)	459 (4.1)	5 (0.4)	425 (6.5)
Japan	r 2 (0.3)	~ ~	0 (0.0)	~ ~
Jordan	12 (0.9)	403 (5.9)	8 (0.6)	377 (5.7)
Korea, Rep. of	6 (0.4)	551 (4.9)	3 (0.4)	516 (9.8)
Latvia	r 23 (1.1)	502 (4.5)	0 (0.1)	~ ~
Lebanon	15 (0.8)	418 (4.6)	26 (1.7)	405 (3.9)
Lithuania	r 2 (0.3)	~ ~	1 (0.2)	~ ~
Macedonia, Rep. of	11 (0.8)	384 (5.9)	5 (0.6)	367 (12.6)
Malaysia	24 (1.0)	496 (4.9)	18 (1.0)	485 (5.0)
Moldova, Rep. of	17 (0.9)	450 (7.2)	10 (0.8)	420 (8.3)
Morocco	r 17 (1.1)	372 (5.6)	50 (1.7)	385 (3.0)
Netherlands	r 0 (0.0)	~ ~	3 (0.4)	502 (11.2)
New Zealand	s 5 (0.7)	475 (10.8)	2 (0.4)	~ ~
Norway	s 4 (0.5)	419 (9.4)	2 (0.3)	~ ~
Palestinian Nat'l Auth.	18 (0.8)	368 (4.2)	6 (0.5)	339 (6.3)
Philippines	13 (0.5)	348 (6.1)	14 (0.9)	339 (5.3)
Romania	13 (1.6)	465 (9.8)	7 (0.8)	392 (9.5)
Russian Federation	6 (0.5)	471 (8.4)	0 (0.1)	~ ~
Saudi Arabia	19 (1.7)	322 (6.2)	41 (1.7)	320 (4.3)
Scotland	x x	x x	x x	x x
Serbia	9 (0.9)	425 (6.0)	1 (0.2)	~ ~
Singapore	r 48 (0.8)	600 (3.9)	11 (0.5)	571 (6.0)
Slovak Republic	r 1 (0.3)	~ ~	0 (0.1)	~ ~
Slovenia	r 8 (0.7)	458 (5.5)	1 (0.2)	~ ~
South Africa	r 18 (0.7)	244 (4.0)	28 (1.1)	223 (4.4)
Sweden	s 9 (0.8)	478 (6.0)	3 (0.5)	441 (11.8)
Tunisia	17 (0.7)	406 (2.8)	44 (1.5)	397 (2.4)
United States	r 6 (0.4)	457 (5.6)	3 (0.3)	436 (7.5)
‡ England	x x	x x	x x	x x
International Avg.	15 (0.1)	434 (1.1)	12 (0.1)	410 (1.4)
Benchmarking Participants				
Basque Country, Spain	20 (1.5)	475 (3.6)	11 (0.8)	457 (5.7)
Indiana State, US	r 7 (0.9)	470 (8.0)	4 (0.5)	487 (15.0)
Ontario Province, Can.	s 3 (0.5)	511 (9.6)	2 (0.4)	~ ~
Quebec Province, Can.	r 10 (0.7)	527 (3.8)	1 (0.3)	~ ~

Background data provided by students.

* Based on countries' categorizations to UNESCO's International Standard Classification of Education (Operational Manual for ISCED-1997).

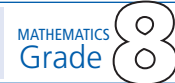
‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals 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. An "s" indicates data are available for at least 50 but less than 70% of the students. An "x" indicates data are available for less than 50% of the students.

Exhibit 4.2: Students' Educational Aspirations Relative to Parents' Educational Level*



Countries		Finish University and Either Parent Went to University or Equivalent		Finish University but Neither Parent Went to University or Equivalent		Not Finish University Regardless of Parents' Education		Do Not Know Regardless of Parents' Education	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	r	36 (1.5)	510 (3.5)	18 (0.9)	492 (4.0)	37 (1.5)	456 (4.2)	9 (0.5)	471 (5.7)
Australia	s	22 (1.3)	555 (6.2)	22 (1.0)	537 (6.3)	45 (1.4)	483 (4.4)	11 (0.7)	506 (6.4)
Bahrain	r	28 (0.7)	440 (2.4)	39 (0.8)	420 (2.5)	16 (0.7)	357 (4.2)	16 (0.6)	379 (4.1)
Belgium (Flemish)	s	16 (1.2)	583 (4.0)	17 (0.9)	578 (3.3)	46 (1.6)	528 (3.4)	21 (0.8)	530 (4.8)
Botswana		8 (0.6)	424 (6.4)	36 (0.9)	395 (2.8)	45 (1.0)	344 (3.1)	12 (0.6)	340 (5.7)
Bulgaria		23 (1.3)	527 (6.3)	28 (1.1)	490 (4.6)	37 (1.7)	445 (5.8)	12 (0.9)	462 (5.6)
Chile		15 (1.0)	473 (4.5)	43 (1.1)	397 (3.9)	36 (1.0)	350 (3.3)	7 (0.4)	350 (6.8)
Chinese Taipei		15 (1.3)	650 (5.0)	56 (1.0)	607 (3.4)	16 (0.9)	500 (4.8)	14 (0.6)	543 (6.6)
Cyprus		23 (0.8)	500 (2.9)	40 (0.9)	482 (2.3)	18 (0.8)	406 (3.1)	19 (0.6)	427 (3.5)
Egypt	r	23 (1.1)	479 (4.4)	44 (1.2)	423 (3.5)	18 (0.8)	369 (3.9)	14 (0.8)	411 (5.0)
Estonia		25 (1.2)	571 (3.6)	19 (0.7)	549 (3.3)	37 (1.1)	513 (3.6)	19 (0.6)	512 (3.7)
Ghana		6 (0.6)	351 (8.6)	21 (1.4)	318 (6.8)	67 (1.5)	263 (3.9)	7 (0.6)	247 (6.9)
Hong Kong, SAR		11 (0.9)	619 (6.0)	63 (1.1)	599 (2.6)	19 (1.0)	547 (5.9)	8 (0.4)	583 (6.2)
Hungary	s	38 (1.8)	583 (3.1)	36 (1.2)	542 (3.5)	19 (1.4)	454 (4.7)	8 (0.7)	491 (10.1)
Indonesia		8 (0.9)	467 (8.4)	46 (1.3)	425 (5.1)	25 (1.2)	390 (7.3)	21 (1.0)	395 (5.8)
Iran, Islamic Rep. of		7 (0.6)	472 (8.3)	37 (0.9)	430 (2.8)	16 (0.8)	385 (3.4)	39 (1.1)	398 (2.4)
Israel	r	35 (1.1)	540 (4.0)	29 (0.9)	499 (4.1)	23 (0.8)	455 (4.8)	14 (0.6)	489 (4.7)
Italy		15 (1.1)	522 (5.7)	35 (1.1)	507 (2.8)	38 (1.2)	458 (3.8)	12 (0.6)	455 (6.1)
Japan	r	29 (1.3)	622 (2.9)	17 (0.7)	594 (3.3)	37 (1.2)	540 (2.3)	18 (0.7)	550 (4.1)
Jordan		27 (1.6)	472 (7.7)	35 (1.2)	437 (3.9)	13 (0.8)	375 (4.6)	24 (1.0)	409 (3.9)
Korea, Rep. of		31 (1.2)	626 (2.8)	48 (0.9)	593 (2.1)	11 (0.5)	514 (4.3)	9 (0.4)	559 (5.2)
Latvia	s	35 (1.7)	540 (3.7)	34 (1.5)	522 (3.3)	16 (1.3)	506 (7.1)	15 (0.9)	489 (6.3)
Lebanon		16 (1.1)	473 (5.4)	52 (1.2)	439 (3.6)	16 (0.9)	403 (3.8)	16 (0.9)	407 (4.8)
Lithuania	r	33 (1.6)	546 (3.0)	42 (1.3)	503 (2.9)	26 (1.2)	461 (3.9)	0 (0.0)	~ ~
Macedonia, Rep. of		20 (1.3)	489 (5.2)	40 (1.1)	463 (3.0)	30 (1.1)	394 (5.2)	10 (0.8)	401 (6.7)
Malaysia		10 (0.9)	549 (7.6)	54 (1.5)	516 (3.9)	26 (1.3)	486 (5.2)	10 (0.7)	509 (6.1)
Moldova, Rep. of	r	23 (1.3)	495 (4.1)	23 (1.0)	477 (5.3)	37 (1.4)	446 (5.3)	17 (0.9)	440 (5.6)
Morocco	r	13 (1.2)	414 (5.2)	38 (1.2)	398 (3.8)	20 (1.1)	376 (4.1)	29 (1.3)	382 (3.5)
Netherlands	r	13 (1.3)	585 (6.0)	16 (1.5)	589 (5.1)	55 (2.5)	527 (3.8)	16 (1.1)	541 (6.6)
New Zealand	s	17 (1.6)	558 (7.8)	22 (1.3)	519 (7.2)	36 (1.9)	484 (5.4)	25 (1.3)	494 (6.8)
Norway	s	47 (1.3)	490 (2.8)	13 (0.9)	469 (5.7)	19 (1.0)	437 (5.1)	21 (0.8)	467 (4.5)
Palestinian Nat'l Auth.		20 (0.8)	440 (4.4)	34 (0.9)	412 (3.1)	19 (0.8)	350 (4.3)	26 (0.8)	379 (3.6)
Philippines		15 (1.2)	438 (7.9)	26 (1.2)	400 (5.4)	44 (1.7)	352 (5.8)	15 (0.9)	365 (6.3)
Romania		14 (1.6)	550 (5.0)	30 (1.2)	520 (4.0)	41 (1.7)	450 (4.9)	16 (1.2)	438 (7.3)
Russian Federation		35 (2.2)	543 (3.5)	30 (1.4)	515 (4.5)	21 (1.2)	475 (5.7)	13 (0.6)	474 (3.9)
Saudi Arabia	r	24 (1.9)	374 (6.3)	45 (1.6)	337 (5.5)	13 (1.0)	310 (5.2)	19 (1.7)	324 (6.3)
Scotland		x x	x x	x x	x x	x x	x x	x x	x x
Serbia		15 (1.1)	547 (3.7)	27 (0.9)	524 (2.8)	48 (1.3)	445 (2.9)	10 (0.6)	429 (5.2)
Singapore	r	13 (0.5)	655 (3.3)	43 (1.1)	627 (2.9)	28 (1.0)	566 (5.0)	15 (0.5)	603 (5.1)
Slovak Republic	r	25 (1.8)	570 (3.9)	27 (1.1)	542 (3.8)	36 (1.5)	479 (3.1)	13 (0.8)	471 (5.8)
Slovenia	r	18 (1.1)	544 (3.5)	26 (0.9)	525 (3.0)	42 (1.1)	464 (2.7)	14 (0.8)	486 (4.9)
South Africa	r	8 (1.0)	391 (16.2)	26 (0.9)	293 (7.8)	54 (1.2)	240 (3.7)	12 (0.8)	232 (6.5)
Sweden	s	32 (1.4)	536 (3.8)	14 (0.8)	513 (5.4)	33 (1.5)	482 (3.5)	21 (0.9)	502 (4.2)
Tunisia		8 (0.7)	453 (5.7)	46 (1.1)	417 (2.8)	26 (0.8)	396 (2.7)	21 (0.7)	406 (2.5)
United States	r	48 (1.3)	535 (3.7)	27 (0.8)	496 (3.3)	16 (0.7)	458 (3.3)	9 (0.3)	494 (4.1)
‡ England		x x	x x	x x	x x	x x	x x	x x	x x
International Avg.		21 (0.2)	516 (0.9)	33 (0.2)	485 (0.7)	30 (0.2)	434 (0.7)	15 (0.1)	447 (0.8)
Benchmarking Participants									
Basque Country, Spain		23 (1.7)	519 (4.3)	27 (1.3)	503 (4.2)	18 (1.2)	461 (4.4)	32 (1.3)	469 (3.1)
Indiana State, US	r	40 (2.4)	535 (7.5)	33 (1.5)	512 (5.0)	16 (1.5)	472 (4.9)	11 (1.0)	497 (7.2)
Ontario Province, Can.	s	39 (2.2)	558 (3.3)	26 (1.4)	534 (3.5)	22 (1.7)	491 (3.4)	13 (0.9)	519 (4.4)
Quebec Province, Can.	r	26 (1.6)	568 (4.8)	28 (1.1)	551 (4.0)	35 (1.9)	525 (2.4)	11 (0.7)	550 (4.6)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

* Based on countries' categorizations to UNESCO's International Standard Classification of Education (Operational Manual for ISCED-1997).

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

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

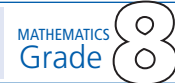
An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students. An "x" indicates data are available for less than 50% of the students.

in relation to their average mathematics achievement, shows that this remains true for the TIMSS 2003 countries, and holds also for mathematics achievement at the fourth grade. At both eighth and fourth grades, students from homes where the language of the test is always or almost always spoken had higher average achievement than those who spoke it less frequently.

Whereas in most countries a large majority of students at each grade are from homes where the language of the test is spoken frequently, on average, internationally about 21 percent of students were from homes where the language of the test was spoken only sometimes, or never. Countries where the majority of students speak the language of the test so infrequently included Botswana, Ghana, Indonesia, Lebanon, the Philippines, Singapore, and South Africa at the eighth grade, and Morocco, the Philippines, and Singapore at the fourth grade. Even though most of these countries had relatively low mathematics achievement, Singapore was a notable exception, with average achievement among those *sometimes or never* speaking the language of the test at home well above the international average for students *always* speaking the language of the test at home.

Many countries tested in more than one language in order to cover their whole student population. These included Bahrain (Arabic and English), Egypt (Arabic, English, and French), Estonia (Estonian and Russian), Hong Kong SAR (Chinese and English), Israel (Hebrew and Arabic), Latvia (Latvian and Russian), Lebanon (French and English), Macedonia (Macedonian and Albanian), Moldova (Moldavian and Russian), New Zealand (English and Maori at grade 4 only), Norway (Bokmål and Nynorsk), the Palestinian National Authority (Arabic and English), Romania (Romanian and Hungarian), the Slovak Republic (Slovak and Hungarian), and South Africa (English and Afrikaans). Among benchmarking participants, the Basque Country, Spain tested in Basque and Castilian, and the Canadian provinces of Ontario and Quebec in English and French. However, in countries like Botswana, Ghana, Indonesia, Morocco,

Exhibit 4.3: Students Speak Language of the Test at Home



Countries	Always		Almost Always		Sometimes		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	80 (1.0)	477 (3.3)	16 (0.8)	491 (4.0)	4 (0.5)	461 (8.4)	0 (0.1)	~ ~
Australia	80 (2.3)	503 (4.1)	12 (1.1)	510 (10.9)	7 (1.3)	534 (15.1)	1 (0.4)	~ ~
Bahrain	66 (1.1)	398 (2.2)	15 (0.7)	424 (3.4)	15 (0.7)	399 (3.7)	4 (0.5)	384 (5.9)
Belgium (Flemish)	77 (1.3)	547 (2.7)	11 (0.6)	527 (6.9)	9 (0.8)	483 (8.3)	4 (0.6)	513 (8.0)
Botswana	5 (0.3)	375 (10.3)	6 (0.4)	402 (8.0)	80 (0.8)	367 (2.6)	9 (0.6)	329 (6.2)
Bulgaria	81 (2.0)	477 (4.0)	10 (0.8)	493 (9.5)	8 (1.4)	454 (12.1)	1 (0.3)	~ ~
Chile	87 (0.7)	390 (3.3)	9 (0.5)	386 (4.5)	4 (0.4)	334 (8.2)	0 (0.1)	~ ~
Chinese Taipei	44 (1.5)	609 (3.9)	36 (1.0)	586 (4.7)	19 (1.2)	537 (8.6)	1 (0.2)	~ ~
Cyprus	79 (0.8)	460 (1.8)	14 (0.6)	469 (4.6)	6 (0.4)	447 (6.7)	2 (0.2)	~ ~
Egypt	61 (1.3)	403 (3.7)	14 (0.8)	428 (5.6)	22 (1.0)	415 (4.4)	3 (0.3)	389 (10.6)
Estonia	90 (0.6)	532 (3.2)	8 (0.4)	532 (4.5)	2 (0.3)	~ ~	1 (0.2)	~ ~
Ghana	23 (1.1)	272 (5.3)	10 (0.7)	295 (8.7)	63 (1.3)	285 (4.6)	5 (0.9)	189 (12.2)
Hong Kong, SAR	77 (0.8)	596 (2.8)	15 (0.6)	566 (6.1)	7 (0.5)	541 (8.5)	1 (0.2)	~ ~
Hungary	95 (0.4)	529 (3.2)	4 (0.4)	533 (9.3)	0 (0.1)	~ ~	0 (0.1)	~ ~
Indonesia	22 (2.0)	406 (7.1)	11 (0.7)	420 (7.5)	57 (2.0)	410 (5.3)	10 (0.8)	412 (7.0)
Iran, Islamic Rep. of	55 (3.2)	422 (3.0)	9 (0.6)	428 (4.8)	21 (1.8)	392 (3.4)	15 (1.9)	391 (5.4)
Israel	79 (1.0)	496 (3.6)	15 (0.7)	506 (5.8)	5 (0.5)	484 (6.1)	1 (0.2)	~ ~
Italy	94 (0.5)	486 (3.1)	3 (0.3)	475 (8.2)	3 (0.3)	424 (10.2)	1 (0.2)	~ ~
Japan	94 (0.4)	572 (2.1)	4 (0.3)	542 (6.8)	1 (0.2)	~ ~	0 (0.1)	~ ~
Jordan	72 (1.2)	420 (3.8)	13 (0.7)	459 (7.6)	11 (0.7)	424 (5.8)	4 (0.5)	423 (17.7)
Korea, Rep. of	71 (0.8)	588 (2.5)	28 (0.8)	595 (2.9)	1 (0.2)	~ ~	0 (0.0)	~ ~
Latvia	77 (1.9)	511 (3.4)	14 (0.9)	509 (4.1)	6 (1.3)	486 (8.0)	2 (0.5)	~ ~
Lebanon	5 (0.5)	425 (8.1)	12 (0.7)	442 (5.1)	68 (1.1)	433 (3.2)	15 (0.8)	428 (5.0)
Lithuania	89 (1.0)	501 (2.6)	9 (0.5)	508 (5.5)	2 (0.4)	~ ~	1 (0.2)	~ ~
Macedonia, Rep. of	89 (1.4)	438 (3.5)	4 (0.4)	429 (8.8)	5 (0.9)	394 (12.2)	2 (0.6)	~ ~
Malaysia	51 (2.1)	490 (4.1)	14 (0.8)	510 (4.5)	28 (1.9)	530 (6.3)	7 (0.8)	551 (9.7)
Moldova, Rep. of	68 (1.6)	461 (4.6)	18 (0.9)	466 (5.3)	13 (1.2)	448 (5.7)	1 (0.2)	~ ~
Morocco	35 (1.8)	375 (3.3)	18 (0.9)	403 (4.4)	39 (1.4)	391 (3.2)	8 (0.8)	394 (6.6)
Netherlands	83 (1.3)	542 (3.8)	12 (1.0)	518 (7.4)	4 (0.5)	491 (12.2)	1 (0.2)	~ ~
New Zealand	80 (1.3)	495 (5.4)	12 (0.8)	487 (7.2)	6 (0.8)	508 (13.4)	1 (0.3)	~ ~
Norway	85 (0.8)	463 (2.4)	10 (0.5)	463 (5.2)	3 (0.4)	427 (8.8)	1 (0.2)	~ ~
Palestinian Nat'l Auth.	73 (1.3)	391 (3.2)	11 (0.6)	410 (5.9)	13 (1.0)	382 (5.6)	2 (0.3)	~ ~
Philippines	2 (0.3)	~ ~	4 (0.3)	386 (10.8)	80 (1.0)	383 (5.3)	14 (0.9)	351 (5.7)
Romania	86 (1.8)	475 (4.9)	8 (0.6)	493 (7.0)	4 (1.0)	453 (17.3)	2 (1.0)	~ ~
Russian Federation	86 (2.0)	507 (3.9)	10 (1.0)	524 (6.5)	4 (1.1)	492 (15.0)	1 (0.3)	~ ~
Saudi Arabia	100 (0.0)	332 (4.6)	0 (0.0)	~ ~	0 (0.0)	~ ~	0 (0.0)	~ ~
Scotland	92 (0.6)	499 (3.7)	5 (0.5)	508 (8.0)	3 (0.3)	446 (10.4)	1 (0.2)	~ ~
Serbia	93 (0.7)	477 (2.6)	5 (0.4)	486 (7.1)	2 (0.4)	~ ~	0 (0.1)	~ ~
Singapore	23 (0.6)	625 (3.8)	19 (0.6)	620 (3.5)	49 (0.8)	595 (4.3)	8 (0.4)	581 (5.7)
Slovak Republic	79 (1.6)	509 (3.5)	12 (0.7)	518 (5.8)	7 (1.0)	480 (8.0)	2 (0.4)	~ ~
Slovenia	80 (1.3)	497 (2.4)	11 (0.7)	488 (3.8)	6 (0.7)	464 (7.1)	2 (0.5)	~ ~
South Africa	18 (1.7)	349 (14.6)	9 (0.7)	319 (13.0)	57 (1.7)	247 (3.1)	15 (1.0)	192 (3.9)
Sweden	84 (1.3)	504 (2.5)	10 (0.8)	491 (5.0)	5 (0.7)	457 (8.8)	1 (0.2)	~ ~
Tunisia	51 (1.7)	408 (2.6)	13 (0.8)	429 (5.1)	28 (1.3)	406 (2.7)	9 (0.9)	411 (5.3)
United States	83 (0.9)	509 (3.1)	10 (0.5)	496 (5.7)	5 (0.4)	464 (6.8)	1 (0.2)	~ ~
‡ England	87 (1.6)	501 (5.3)	10 (1.3)	504 (6.3)	2 (0.6)	~ ~	1 (0.2)	~ ~
International Avg.	68 (0.2)	472 (0.7)	11 (0.1)	477 (1.0)	17 (0.1)	441 (1.4)	4 (0.1)	396 (2.0)
Benchmarking Participants								
Basque Country, Spain	65 (1.6)	487 (3.3)	25 (1.1)	490 (3.5)	8 (0.7)	485 (5.1)	3 (0.5)	476 (10.2)
Indiana State, US	88 (0.9)	509 (5.1)	7 (0.8)	514 (9.0)	4 (0.4)	488 (11.6)	1 (0.2)	~ ~
Ontario Province, Can.	72 (2.0)	520 (2.8)	16 (1.1)	517 (4.8)	9 (0.9)	530 (9.2)	2 (0.3)	~ ~
Quebec Province, Can.	72 (1.8)	545 (3.2)	19 (0.9)	540 (5.0)	7 (0.9)	532 (5.8)	2 (0.4)	~ ~

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

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

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit 4.3: Students Speak Language of the Test at Home

Countries	Always		Almost Always		Sometimes		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	84 (1.0)	459 (3.6)	11 (0.7)	470 (5.7)	4 (0.4)	427 (11.3)	1 (0.2)	~ ~
Australia	80 (1.7)	500 (4.3)	11 (0.9)	510 (6.1)	8 (1.0)	488 (7.2)	1 (0.2)	~ ~
Belgium (Flemish)	68 (1.4)	558 (1.7)	16 (0.9)	550 (2.9)	12 (1.2)	517 (5.2)	4 (0.5)	533 (6.7)
Chinese Taipei	31 (1.2)	581 (2.3)	41 (0.8)	563 (1.7)	26 (1.1)	548 (2.7)	1 (0.1)	~ ~
Cyprus	72 (1.1)	510 (2.4)	14 (0.7)	526 (4.4)	11 (0.6)	497 (5.8)	3 (0.3)	488 (9.6)
England	82 (1.3)	534 (3.9)	12 (0.8)	540 (5.9)	5 (0.7)	476 (7.9)	1 (0.2)	~ ~
Hong Kong, SAR	51 (1.3)	592 (3.4)	24 (0.8)	568 (3.3)	21 (1.0)	554 (3.8)	4 (0.4)	521 (5.1)
Hungary	91 (0.6)	530 (3.0)	8 (0.6)	536 (6.2)	1 (0.2)	~ ~	0 (0.1)	~ ~
Iran, Islamic Rep. of	53 (3.4)	407 (4.6)	6 (0.5)	405 (9.9)	21 (1.9)	379 (6.0)	20 (2.5)	354 (6.8)
Italy	88 (0.7)	508 (3.7)	3 (0.3)	487 (9.5)	6 (0.5)	470 (7.1)	2 (0.3)	~ ~
Japan	91 (0.5)	568 (1.6)	8 (0.5)	546 (5.2)	1 (0.2)	~ ~	0 (0.1)	~ ~
Latvia	78 (1.5)	537 (2.8)	15 (0.8)	546 (4.6)	6 (0.8)	511 (7.9)	2 (0.4)	~ ~
Lithuania	83 (1.0)	534 (3.1)	13 (0.8)	556 (5.2)	3 (0.6)	494 (10.7)	0 (0.1)	~ ~
Moldova, Rep. of	76 (1.8)	508 (5.4)	14 (1.0)	501 (7.8)	9 (1.1)	502 (8.2)	1 (0.3)	~ ~
Morocco	35 (2.3)	344 (5.9)	11 (0.8)	344 (7.1)	28 (1.6)	362 (6.2)	27 (2.5)	350 (8.9)
Netherlands	75 (1.2)	547 (1.9)	17 (0.9)	532 (3.7)	7 (0.8)	503 (7.1)	1 (0.3)	~ ~
New Zealand	76 (1.0)	500 (2.2)	13 (0.6)	509 (4.8)	11 (0.8)	443 (7.1)	1 (0.2)	~ ~
Norway	78 (1.0)	455 (2.4)	15 (0.8)	458 (3.8)	5 (0.5)	410 (8.3)	1 (0.2)	~ ~
Philippines	6 (0.6)	321 (10.9)	8 (0.9)	336 (21.1)	59 (1.8)	382 (8.5)	27 (2.1)	325 (6.8)
Russian Federation	81 (2.3)	531 (4.7)	8 (0.7)	546 (7.1)	8 (1.7)	532 (15.2)	2 (0.5)	~ ~
Scotland	78 (1.3)	495 (3.2)	10 (0.6)	501 (6.2)	9 (0.8)	466 (6.0)	3 (0.4)	439 (12.7)
Singapore	24 (1.2)	610 (6.2)	22 (1.0)	625 (4.9)	47 (1.5)	580 (5.7)	7 (0.6)	551 (8.6)
Slovenia	72 (1.3)	480 (2.8)	18 (1.1)	496 (3.9)	8 (1.0)	459 (5.5)	2 (0.3)	~ ~
Tunisia	43 (2.5)	342 (6.9)	9 (0.8)	341 (9.4)	36 (2.2)	347 (5.3)	12 (1.5)	353 (9.9)
United States	73 (1.1)	526 (2.4)	13 (0.5)	525 (4.0)	12 (0.8)	477 (4.8)	2 (0.1)	~ ~
International Avg.	67 (0.3)	499 (0.9)	14 (0.2)	501 (1.4)	15 (0.2)	471 (1.6)	5 (0.2)	435 (2.9)
Benchmarking Participants								
Indiana State, US	83 (0.9)	534 (2.8)	11 (0.7)	550 (5.8)	5 (0.7)	502 (8.3)	1 (0.2)	~ ~
Ontario Province, Can.	63 (1.7)	510 (3.5)	24 (1.1)	526 (5.1)	13 (1.1)	492 (6.8)	1 (0.2)	~ ~
Quebec Province, Can.	67 (1.3)	505 (2.6)	24 (0.9)	515 (3.7)	8 (0.8)	490 (5.0)	2 (0.3)	~ ~

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

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

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

the Philippines, Singapore, and South Africa, testing in all possible dialects and languages was prohibitive.

Earlier IEA studies have shown that students from homes with extensive literacy resources have higher achievement than those from less advantaged backgrounds. For example, TIMSS 1999 has shown a consistent relationship between number of books in the home and student achievement in both mathematics and science at the eighth grade,² and PIRLS 2001 demonstrated a similar relationship with reading literacy at the fourth grade.³ Providing further information on this topic, Exhibit 4.4 shows for each country at both eighth and fourth grades the percentage of students at each of five ranges of numbers of books in the home in relation to average mathematics achievement. This exhibit reveals a wide range both across and within each country. For example, the percentage of eighth-grade students reporting more than 200 books in their homes exceeded 30 percent in Australia, Estonia, Hungary, and Sweden, whereas in Botswana, Egypt, Ghana, Indonesia, Iran, Morocco, the Philippines, and South Africa, more than 30 percent of students were from homes with 10 books or less. The situation among fourth-grade students was similar.

Across countries, on average, 15 percent of eighth-grade student were from homes with more than 200 books, 13 percent from homes with 101-200 books, 27 percent from homes with 26-100 books, 26 percent from homes with 11-25 books, and 18 percent with 0-10 books. There also was a clear-cut relationship, on average, between number of books in the home and mathematics achievement. Eighth-grade students reporting more than 200 books in their homes had an average score of 498 on the mathematics scale, compared with an average of just 429 for students reporting 10 books or less, a difference of 69 points. If anything, the difference at fourth grade was even larger, ranging from 521 for students reporting more than 200 books to 457 for students reporting 10 books or less.

In addition to literacy resources such as books, TIMSS has found that having study aids such as a computer or a study desk or table at

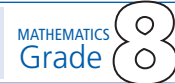
- 2 Mullis, I.V.S., Martin, M.O., Gonzalez, E.J., Gregory, K.D., Garden, R.A., O'Connor, K.M., Chrostowski, S.J., and Smith, T.A. (2000), *TIMSS 1999 International Mathematics Report: Findings from IEA's Repeat of the Third International Mathematics and Science Study at the Eighth Grade*, Chestnut Hill, MA: Boston College; Martin, M.O., Mullis, I.V.S., Gonzalez, E.J., Gregory, K.D., Smith, T.A., Chrostowski, S.J., Garden, R.A., and O'Connor, K.M. (2000), *TIMSS 1999 International Science Report: Findings from IEA's Repeat of the Third International Mathematics and Science Study at the Eighth Grade*, Chestnut Hill, MA: Boston College.
- 3 Mullis, I.V.S., Martin, M.O., Gonzalez, E.J., and Kennedy, A.M. (2003), *PIRLS 2001 International Report: IEA's Study of Reading Literacy Achievement in Primary Schools in 35 Countries*, Chestnut Hill, MA: Boston College.

home was associated with higher student achievement. Exhibit 4.5 shows the percentage of eighth- and fourth-grade students in each country that had a computer or study desk or table, together with their average mathematics achievement. About 60 percent of eighth-grade students, on average, reported having a computer at home, and a slightly greater percentage of fourth-grade students (65%). However, there were great differences between countries. For 17 of the participants – Australia, Belgium (Flemish), Chinese Taipei, England, Hong Kong SAR, Israel, Korea, the Netherlands, New Zealand, Norway, Scotland, Singapore, Sweden, the United States, Indiana, Ontario, and Quebec – virtually all eighth-grade students (90% or more) reported having a computer at home. In contrast, less than 20 percent of eighth-grade students in Armenia, Botswana, Egypt, Indonesia, Moldova, and Morocco reported having a computer. The mathematics achievement difference between students with a computer at home and those without was substantial on average – 39 scale score points at eighth grade and 27 points at fourth grade.

Perhaps not surprisingly, somewhat greater percentages of students reported having a study desk or table at home – 83 percent and 80 percent at eighth and fourth grades, respectively. In many countries (20 at eighth grade and 9 at fourth grade), more than 90 percent of students reported having a study desk. Having such a study facility was associated with higher average mathematics achievement at both grades – a 35 point difference at eighth grade and a 27 point difference at fourth grade.

Because having a computer at home does not necessarily mean that students have access to it, TIMSS also asked students where they actually use a computer – at home, at school, or some other place. Exhibit 4.6 summarizes these responses, presenting countries in order of the percentage of students that reported using a computer both at home and at school. At the eighth grade, 39 percent of the students, on average, across countries reported using a computer both at home and at school. Eighteen percent reported using a computer at home

Exhibit 4.4: Books in the Home



Countries	More than 200 Books		101-200 Books		26-100 Books	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	20 (1.0)	497 (4.1)	13 (0.6)	497 (4.8)	28 (0.7)	483 (3.4)
Australia	31 (1.4)	526 (5.0)	23 (0.8)	514 (4.6)	30 (1.0)	501 (6.0)
Bahrain	17 (0.5)	416 (3.1)	14 (0.6)	426 (3.7)	31 (0.8)	407 (2.1)
Belgium (Flemish)	12 (0.6)	560 (4.6)	15 (0.6)	558 (3.6)	34 (0.9)	544 (2.9)
Botswana	4 (0.5)	401 (12.5)	5 (0.3)	400 (6.9)	13 (0.6)	386 (5.8)
Bulgaria	28 (1.3)	502 (6.3)	18 (0.9)	492 (5.3)	25 (1.1)	472 (4.3)
Chile	5 (0.4)	461 (5.9)	7 (0.4)	444 (5.1)	27 (0.9)	415 (3.7)
Chinese Taipei	15 (1.0)	639 (4.9)	14 (0.6)	622 (4.8)	30 (0.7)	600 (4.7)
Cyprus	11 (0.5)	492 (4.6)	16 (0.7)	478 (3.6)	35 (0.8)	472 (2.5)
Egypt	6 (0.4)	433 (8.8)	6 (0.4)	426 (9.5)	18 (0.7)	426 (4.8)
Estonia	45 (1.2)	549 (3.3)	18 (0.6)	534 (3.6)	23 (0.7)	515 (3.5)
Ghana	10 (0.6)	275 (7.2)	6 (0.4)	300 (9.6)	16 (0.7)	294 (7.8)
Hong Kong, SAR	9 (0.6)	608 (6.3)	8 (0.4)	611 (4.6)	27 (0.6)	595 (3.6)
Hungary	31 (1.2)	567 (3.3)	22 (0.7)	543 (3.7)	29 (1.0)	516 (3.5)
Indonesia	1 (0.2)	~ ~	3 (0.3)	443 (10.2)	19 (0.7)	423 (5.8)
Iran, Islamic Rep. of	7 (0.5)	456 (5.8)	5 (0.3)	452 (5.2)	17 (0.8)	432 (3.6)
Israel	22 (0.9)	520 (4.6)	22 (0.7)	514 (3.9)	33 (0.8)	492 (4.2)
Italy	19 (0.9)	516 (4.7)	14 (0.6)	501 (4.2)	25 (0.7)	489 (3.8)
Japan	17 (0.7)	604 (3.5)	17 (0.5)	587 (3.5)	32 (0.8)	571 (2.4)
Jordan	9 (0.6)	456 (9.1)	8 (0.5)	463 (7.7)	28 (0.9)	445 (4.8)
Korea, Rep. of	19 (0.8)	636 (3.3)	22 (0.7)	608 (2.9)	33 (0.8)	586 (2.4)
Latvia	28 (1.3)	528 (4.3)	25 (0.8)	515 (4.2)	31 (1.1)	505 (3.3)
Lebanon	8 (0.6)	447 (6.6)	8 (0.8)	465 (6.5)	25 (1.0)	457 (3.9)
Lithuania	12 (0.8)	540 (5.2)	15 (0.7)	532 (3.9)	34 (0.9)	509 (2.4)
Macedonia, Rep. of	8 (0.7)	452 (8.2)	8 (0.6)	475 (6.6)	28 (0.9)	465 (3.8)
Malaysia	5 (0.5)	555 (8.0)	9 (0.6)	539 (6.0)	28 (0.8)	524 (4.4)
Moldova, Rep. of	8 (0.8)	488 (6.7)	9 (0.6)	483 (7.0)	23 (1.0)	471 (4.6)
Morocco	5 (0.6)	396 (11.4)	4 (0.3)	403 (6.6)	21 (0.9)	391 (4.5)
Netherlands	21 (1.4)	565 (5.3)	19 (0.9)	558 (4.6)	31 (1.3)	539 (3.8)
New Zealand	25 (1.5)	527 (8.0)	22 (1.1)	508 (4.4)	31 (1.0)	489 (5.2)
Norway	27 (1.2)	481 (3.2)	22 (0.7)	477 (3.1)	33 (0.9)	460 (3.0)
Palestinian Nat'l Auth.	7 (0.5)	402 (7.9)	6 (0.4)	420 (7.1)	24 (0.7)	413 (4.2)
Philippines	3 (0.3)	372 (9.4)	4 (0.3)	403 (12.4)	17 (0.8)	410 (7.2)
Romania	12 (1.2)	529 (6.6)	13 (1.1)	517 (5.1)	29 (1.2)	489 (4.1)
Russian Federation	21 (1.3)	534 (4.4)	26 (0.9)	521 (3.6)	32 (1.4)	505 (4.4)
Saudi Arabia	10 (0.7)	347 (8.5)	9 (0.9)	355 (9.0)	25 (1.0)	347 (5.7)
Scotland	17 (1.0)	539 (5.6)	16 (0.7)	527 (4.0)	29 (0.8)	504 (3.8)
Serbia	6 (0.5)	519 (5.8)	9 (0.5)	534 (4.9)	27 (1.0)	500 (3.2)
Singapore	14 (0.5)	642 (3.5)	16 (0.5)	627 (3.7)	33 (0.7)	617 (3.2)
Slovak Republic	12 (0.8)	551 (5.4)	18 (0.8)	543 (3.9)	41 (0.9)	514 (3.1)
Slovenia	13 (0.7)	517 (5.3)	15 (0.7)	513 (4.4)	38 (0.9)	501 (2.1)
South Africa	6 (0.5)	324 (17.5)	5 (0.4)	325 (19.5)	14 (0.7)	304 (11.7)
Sweden	32 (1.3)	531 (2.7)	21 (0.6)	513 (3.1)	27 (0.9)	485 (3.4)
Tunisia	4 (0.4)	453 (7.8)	6 (0.5)	436 (6.6)	22 (0.9)	422 (3.4)
United States	24 (0.9)	541 (4.4)	18 (0.5)	528 (3.4)	28 (0.6)	506 (3.0)
‡ England	24 (1.1)	539 (6.9)	18 (1.0)	518 (6.7)	27 (1.0)	494 (5.5)
International Avg.	15 (0.1)	498 (1.0)	13 (0.1)	492 (1.0)	27 (0.1)	476 (0.6)
Benchmarking Participants						
Basque Country, Spain	25 (1.4)	509 (3.5)	20 (0.9)	497 (3.6)	36 (1.3)	486 (3.1)
Indiana State, US	19 (1.6)	541 (8.8)	17 (0.9)	526 (6.8)	32 (1.0)	514 (4.6)
Ontario Province, Can.	28 (1.6)	544 (3.4)	21 (0.9)	532 (3.5)	31 (1.1)	513 (3.7)
Quebec Province, Can.	13 (0.8)	561 (4.9)	16 (0.9)	563 (5.5)	33 (0.9)	547 (3.1)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

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

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.



Exhibit 4.4: Books in the Home

Countries	11-25 Books		0-10 Books	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	24 (0.9)	466 (4.2)	15 (0.9)	449 (4.5)
Australia	11 (0.8)	477 (7.1)	5 (0.5)	448 (10.8)
Bahrain	26 (0.8)	384 (3.4)	11 (0.5)	376 (3.9)
Belgium (Flemish)	25 (0.8)	527 (4.0)	14 (0.7)	497 (5.9)
Botswana	30 (0.9)	368 (4.1)	48 (1.3)	355 (2.6)
Bulgaria	15 (0.7)	453 (5.7)	14 (1.6)	441 (11.2)
Chile	37 (0.9)	374 (3.1)	23 (1.2)	342 (3.8)
Chinese Taipei	24 (0.9)	564 (4.8)	17 (0.9)	513 (5.3)
Cyprus	27 (0.7)	441 (3.4)	11 (0.5)	410 (4.2)
Egypt	38 (0.8)	408 (3.8)	33 (1.2)	398 (3.5)
Estonia	11 (0.6)	503 (4.4)	3 (0.3)	476 (6.8)
Ghana	34 (1.0)	285 (6.0)	34 (1.5)	264 (4.7)
Hong Kong, SAR	28 (0.7)	583 (3.9)	28 (0.7)	567 (4.4)
Hungary	13 (0.6)	481 (4.7)	5 (0.7)	433 (9.1)
Indonesia	45 (0.9)	404 (5.2)	32 (1.0)	408 (5.7)
Iran, Islamic Rep. of	31 (0.8)	411 (2.7)	39 (1.3)	391 (2.7)
Israel	17 (0.8)	466 (4.4)	6 (0.4)	465 (7.0)
Italy	29 (0.7)	464 (3.9)	13 (0.7)	450 (4.8)
Japan	22 (0.6)	553 (3.2)	13 (0.7)	533 (3.7)
Jordan	33 (0.9)	416 (3.8)	23 (0.8)	398 (4.2)
Korea, Rep. of	10 (0.6)	555 (3.8)	15 (0.7)	534 (3.4)
Latvia	12 (0.7)	480 (5.6)	4 (0.4)	453 (8.2)
Lebanon	36 (1.1)	422 (3.5)	23 (1.4)	410 (3.0)
Lithuania	30 (1.1)	477 (3.0)	10 (0.7)	455 (5.9)
Macedonia, Rep. of	40 (1.2)	427 (3.6)	17 (0.8)	388 (5.2)
Malaysia	40 (1.0)	498 (4.0)	17 (0.9)	477 (4.7)
Moldova, Rep. of	37 (1.2)	457 (4.8)	23 (1.1)	438 (6.2)
Morocco	38 (1.0)	385 (3.2)	33 (1.4)	387 (3.2)
Netherlands	19 (1.2)	504 (6.5)	10 (0.8)	490 (6.2)
New Zealand	14 (0.8)	464 (5.2)	8 (0.7)	439 (8.9)
Norway	11 (0.6)	425 (4.2)	7 (0.4)	408 (7.2)
Palestinian Nat'l Auth.	36 (0.8)	387 (3.6)	27 (1.0)	371 (3.5)
Philippines	34 (0.8)	382 (4.8)	43 (1.0)	361 (5.4)
Romania	27 (1.4)	454 (5.1)	20 (1.7)	430 (8.1)
Russian Federation	17 (1.1)	476 (5.3)	4 (0.5)	457 (9.1)
Saudi Arabia	33 (1.1)	321 (5.1)	23 (1.4)	318 (4.6)
Scotland	21 (1.0)	471 (4.4)	16 (0.9)	450 (4.8)
Serbia	38 (1.0)	466 (2.9)	21 (1.1)	435 (4.5)
Singapore	24 (0.7)	580 (5.1)	12 (0.7)	554 (5.2)
Slovak Republic	24 (1.1)	465 (3.8)	5 (0.5)	424 (7.3)
Slovenia	27 (0.7)	474 (3.6)	8 (0.6)	444 (5.4)
South Africa	31 (0.9)	261 (5.0)	44 (1.3)	241 (3.1)
Sweden	14 (0.7)	460 (4.0)	6 (0.6)	447 (6.3)
Tunisia	44 (1.1)	404 (2.2)	23 (1.1)	400 (2.3)
United States	18 (0.6)	473 (3.5)	13 (0.6)	449 (4.2)
‡ England	17 (0.9)	480 (5.9)	13 (1.1)	446 (5.7)
International Avg.	26 (0.1)	449 (0.7)	18 (0.1)	429 (1.0)
Benchmarking Participants				
Basque Country, Spain	15 (0.8)	458 (3.4)	5 (0.5)	430 (7.5)
Indiana State, US	19 (1.0)	484 (5.9)	14 (1.2)	467 (5.4)
Ontario Province, Can.	14 (0.9)	494 (4.2)	7 (0.6)	482 (6.7)
Quebec Province, Can.	24 (1.1)	529 (2.5)	14 (0.7)	521 (3.4)

Background data provided by students.

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

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit 4.4: Books in the Home

Countries	More than 200 Books		101-200 Books		26-100 Books	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	18 (1.0)	476 (4.8)	14 (0.7)	474 (5.7)	29 (1.1)	474 (3.6)
Australia	23 (1.3)	517 (4.7)	23 (1.1)	519 (4.2)	34 (1.1)	496 (3.8)
Belgium (Flemish)	11 (0.7)	559 (3.7)	17 (0.7)	567 (2.7)	42 (1.0)	558 (1.8)
Chinese Taipei	15 (0.8)	588 (3.1)	14 (0.6)	584 (3.0)	30 (0.7)	571 (2.1)
Cyprus	9 (0.7)	518 (5.5)	14 (0.7)	527 (4.8)	38 (1.0)	523 (3.0)
England	19 (1.2)	565 (6.0)	20 (1.0)	552 (4.9)	35 (1.2)	536 (4.5)
Hong Kong, SAR	7 (0.6)	587 (5.8)	10 (0.8)	590 (5.0)	28 (1.0)	585 (3.9)
Hungary	18 (1.1)	561 (4.6)	17 (0.8)	552 (4.3)	35 (1.0)	537 (3.1)
Iran, Islamic Rep. of	5 (0.6)	424 (10.4)	5 (0.5)	409 (11.6)	13 (0.9)	423 (6.3)
Italy	10 (0.8)	505 (5.3)	11 (0.6)	515 (4.7)	27 (0.8)	515 (4.3)
Japan	7 (0.4)	590 (5.1)	14 (0.6)	587 (4.1)	40 (0.9)	575 (1.9)
Latvia	17 (0.9)	550 (4.0)	21 (0.9)	551 (3.7)	38 (1.1)	542 (3.5)
Lithuania	8 (0.6)	556 (6.0)	11 (0.6)	562 (4.9)	36 (1.0)	551 (3.1)
Moldova, Rep. of	6 (0.6)	536 (10.2)	8 (0.7)	539 (7.3)	24 (1.2)	527 (6.0)
Morocco	2 (0.3)	~ ~	3 (0.3)	362 (11.6)	10 (1.0)	371 (9.7)
Netherlands	14 (1.1)	563 (4.0)	18 (1.0)	554 (3.3)	37 (1.2)	542 (2.3)
New Zealand	17 (0.7)	523 (3.5)	21 (0.8)	520 (4.0)	36 (1.0)	499 (2.7)
Norway	17 (0.9)	469 (4.0)	22 (0.8)	471 (3.6)	37 (0.9)	457 (2.8)
Philippines	5 (0.6)	333 (13.6)	6 (0.6)	366 (21.8)	14 (1.1)	399 (18.0)
Russian Federation	13 (0.7)	548 (6.7)	15 (0.8)	544 (6.6)	35 (1.2)	539 (4.9)
Scotland	21 (1.1)	507 (5.3)	18 (0.8)	512 (5.5)	31 (1.0)	500 (3.2)
Singapore	10 (0.6)	628 (6.4)	17 (0.9)	622 (5.6)	40 (0.9)	609 (5.0)
Slovenia	13 (0.9)	482 (6.9)	15 (0.9)	501 (5.1)	36 (0.9)	495 (2.8)
Tunisia	4 (0.6)	378 (12.6)	8 (0.8)	374 (10.4)	18 (1.2)	375 (6.9)
United States	15 (0.7)	545 (3.6)	17 (0.5)	548 (2.9)	34 (0.7)	526 (2.4)
International Avg.	12 (0.2)	521 (1.4)	14 (0.2)	516 (1.5)	31 (0.2)	509 (1.2)
Benchmarking Participants						
Indiana State, US	16 (1.1)	542 (5.1)	19 (1.1)	555 (4.9)	36 (1.1)	540 (2.8)
Ontario Province, Can.	20 (1.4)	531 (5.5)	22 (1.1)	526 (5.3)	35 (1.3)	510 (3.6)
Quebec Province, Can.	7 (0.5)	522 (4.7)	11 (0.7)	528 (3.5)	44 (1.0)	514 (2.6)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

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

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

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

Exhibit 4.4: Books in the Home

Countries	11-25 Books		0-10 Books	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	22 (0.9)	456 (5.2)	17 (1.2)	434 (6.3)
Australia	13 (0.9)	477 (5.7)	6 (0.8)	437 (9.6)
Belgium (Flemish)	23 (0.9)	537 (3.0)	8 (0.5)	512 (5.2)
Chinese Taipei	24 (0.8)	555 (2.1)	17 (0.8)	527 (2.8)
Cyprus	29 (1.0)	506 (3.3)	11 (0.7)	467 (5.1)
England	17 (1.0)	497 (4.5)	8 (0.8)	466 (5.9)
Hong Kong, SAR	30 (0.8)	572 (3.4)	25 (1.4)	561 (4.0)
Hungary	22 (0.9)	500 (3.8)	8 (0.7)	469 (6.0)
Iran, Islamic Rep. of	22 (1.2)	410 (4.4)	55 (2.1)	374 (4.0)
Italy	33 (1.0)	498 (4.4)	18 (0.9)	489 (7.0)
Japan	28 (0.8)	549 (2.7)	12 (0.8)	528 (3.8)
Latvia	18 (0.9)	517 (4.4)	6 (0.7)	488 (7.6)
Lithuania	34 (1.1)	526 (3.4)	13 (0.9)	491 (5.0)
Moldova, Rep. of	31 (1.4)	502 (6.8)	30 (1.4)	477 (6.3)
Morocco	26 (1.5)	352 (5.4)	60 (2.1)	352 (6.4)
Netherlands	21 (1.1)	529 (3.0)	9 (0.8)	500 (6.5)
New Zealand	17 (0.6)	464 (4.4)	9 (0.7)	430 (4.8)
Norway	17 (0.8)	428 (5.6)	7 (0.5)	400 (5.4)
Philippines	27 (1.1)	391 (8.7)	48 (2.1)	332 (5.2)
Russian Federation	27 (1.5)	522 (5.1)	10 (0.7)	499 (8.4)
Scotland	20 (1.1)	469 (4.1)	11 (0.7)	445 (5.3)
Singapore	22 (0.9)	569 (4.9)	11 (0.8)	528 (8.7)
Slovenia	28 (1.1)	466 (3.7)	7 (0.6)	422 (6.1)
Tunisia	29 (1.5)	359 (5.2)	41 (2.3)	321 (5.5)
United States	22 (0.6)	496 (2.7)	13 (0.6)	473 (3.0)
International Avg.	24 (0.2)	486 (1.0)	18 (0.2)	457 (1.2)
Benchmarking Participants				
Indiana State, US	19 (1.2)	515 (3.7)	10 (0.8)	490 (6.7)
Ontario Province, Can.	16 (1.3)	494 (4.2)	7 (0.9)	463 (5.7)
Quebec Province, Can.	27 (0.8)	496 (2.9)	11 (0.7)	478 (4.7)

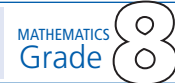
Background data provided by students.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals 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.

Exhibit 4.5: Computer and Study Desk/Table in the Home



SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Countries	Have Computer		Do Not Have Computer		Have Study Desk/Table		Do Not Have Study Desk/Table	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	19 (0.7)	479 (4.4)	81 (0.7)	479 (3.3)	64 (1.1)	489 (3.1)	36 (1.1)	461 (4.0)
Australia	96 (0.3)	508 (4.6)	4 (0.3)	448 (9.6)	92 (0.5)	508 (4.8)	8 (0.5)	484 (5.8)
Bahrain	81 (0.6)	407 (1.6)	19 (0.6)	379 (3.7)	80 (0.7)	407 (1.9)	20 (0.7)	382 (3.5)
Belgium (Flemish)	95 (0.5)	541 (2.7)	5 (0.5)	476 (8.7)	95 (0.4)	540 (2.7)	5 (0.4)	495 (6.2)
Botswana	16 (0.8)	370 (7.2)	84 (0.8)	369 (2.3)	68 (0.8)	376 (2.7)	32 (0.8)	354 (3.6)
Bulgaria	37 (1.5)	493 (5.7)	63 (1.5)	470 (4.7)	79 (1.2)	482 (4.4)	21 (1.2)	458 (7.6)
Chile	39 (1.4)	423 (3.6)	61 (1.4)	365 (3.2)	56 (1.0)	403 (3.3)	44 (1.0)	368 (3.8)
Chinese Taipei	91 (0.8)	592 (4.4)	9 (0.8)	512 (6.0)	93 (0.5)	589 (4.5)	7 (0.5)	537 (6.9)
Cyprus	82 (0.6)	470 (1.5)	18 (0.6)	417 (4.2)	95 (0.3)	464 (1.5)	5 (0.3)	391 (6.6)
Egypt	16 (0.8)	443 (5.5)	84 (0.8)	403 (3.6)	80 (1.0)	423 (3.4)	20 (1.0)	360 (4.0)
Estonia	67 (1.1)	540 (3.1)	33 (1.1)	515 (3.3)	93 (0.6)	531 (3.1)	7 (0.6)	532 (5.6)
Ghana	24 (1.1)	272 (6.4)	76 (1.1)	284 (4.8)	60 (1.5)	298 (4.8)	40 (1.5)	258 (5.1)
Hong Kong, SAR	97 (0.3)	588 (3.3)	3 (0.3)	560 (8.5)	75 (0.8)	590 (3.4)	25 (0.8)	577 (4.0)
Hungary	75 (1.0)	542 (3.0)	25 (1.0)	497 (4.9)	98 (0.3)	531 (3.1)	2 (0.3)	~ ~
Indonesia	17 (1.3)	431 (5.4)	83 (1.3)	412 (4.9)	75 (1.2)	418 (4.7)	25 (1.2)	393 (5.6)
Iran, Islamic Rep. of	27 (1.4)	433 (4.0)	73 (1.4)	407 (2.3)	50 (1.6)	426 (2.5)	50 (1.6)	399 (2.7)
Israel	92 (0.7)	501 (3.4)	8 (0.7)	442 (9.3)	97 (0.3)	498 (3.5)	3 (0.3)	464 (9.4)
Italy	84 (0.7)	490 (3.2)	16 (0.7)	453 (4.4)	88 (0.6)	486 (3.2)	12 (0.6)	467 (4.8)
Japan	82 (0.8)	576 (2.1)	18 (0.8)	542 (3.1)	96 (0.3)	572 (2.0)	4 (0.3)	537 (8.0)
Jordan	41 (1.7)	454 (5.8)	59 (1.7)	407 (3.6)	73 (1.3)	435 (4.3)	27 (1.3)	400 (5.2)
Korea, Rep. of	98 (0.3)	591 (2.1)	2 (0.3)	~ ~	97 (0.3)	592 (2.1)	3 (0.3)	516 (9.0)
Latvia	43 (1.6)	523 (3.4)	57 (1.6)	499 (3.5)	94 (0.6)	510 (3.3)	6 (0.6)	498 (6.3)
Lebanon	59 (1.5)	444 (3.5)	41 (1.5)	419 (3.6)	71 (1.2)	440 (3.3)	29 (1.2)	418 (3.5)
Lithuania	48 (1.6)	522 (2.9)	52 (1.6)	482 (2.6)	97 (0.3)	502 (2.6)	3 (0.3)	471 (12.0)
Macedonia, Rep. of	42 (1.6)	452 (4.9)	58 (1.6)	427 (3.4)	87 (0.8)	442 (3.6)	13 (0.8)	401 (6.5)
Malaysia	57 (1.4)	525 (4.8)	43 (1.4)	487 (3.9)	87 (0.6)	511 (4.2)	13 (0.6)	489 (5.8)
Moldova, Rep. of	18 (1.0)	465 (5.7)	82 (1.0)	460 (4.1)	80 (1.2)	463 (4.2)	20 (1.2)	449 (5.2)
Morocco	18 (1.2)	391 (4.6)	82 (1.2)	388 (2.7)	73 (1.4)	392 (2.6)	27 (1.4)	379 (4.4)
Netherlands	98 (0.3)	538 (3.9)	2 (0.3)	~ ~	99 (0.2)	537 (3.9)	1 (0.2)	~ ~
New Zealand	91 (0.7)	497 (5.5)	9 (0.7)	471 (7.6)	87 (0.8)	499 (5.3)	13 (0.8)	465 (7.2)
Norway	96 (0.4)	464 (2.4)	4 (0.4)	415 (9.5)	98 (0.3)	463 (2.4)	2 (0.3)	~ ~
Palestinian Nat'l Auth.	41 (1.2)	409 (4.1)	59 (1.2)	380 (3.0)	77 (1.3)	396 (3.2)	23 (1.3)	377 (4.4)
Philippines	21 (1.1)	391 (8.1)	79 (1.1)	376 (5.1)	75 (1.1)	386 (5.4)	25 (1.1)	358 (5.6)
Romania	32 (1.9)	507 (5.8)	68 (1.9)	465 (4.6)	77 (1.8)	492 (4.3)	23 (1.8)	432 (6.9)
Russian Federation	30 (2.0)	533 (4.8)	70 (2.0)	498 (3.6)	92 (0.5)	511 (3.8)	8 (0.5)	484 (5.9)
Saudi Arabia	57 (1.9)	342 (5.5)	43 (1.9)	320 (3.7)	61 (1.5)	341 (5.2)	39 (1.5)	321 (4.2)
Scotland	91 (0.7)	502 (3.7)	9 (0.7)	464 (6.3)	82 (0.8)	503 (3.8)	18 (0.8)	475 (5.3)
Serbia	44 (1.4)	499 (3.5)	56 (1.4)	463 (2.5)	91 (0.6)	481 (2.6)	9 (0.6)	442 (6.6)
Singapore	94 (0.4)	610 (3.4)	6 (0.4)	538 (7.4)	91 (0.5)	609 (3.4)	9 (0.5)	570 (6.2)
Slovak Republic	67 (1.2)	519 (3.5)	33 (1.2)	485 (3.7)	88 (0.8)	512 (3.3)	12 (0.8)	477 (4.9)
Slovenia	86 (0.9)	498 (2.1)	14 (0.9)	469 (4.5)	97 (0.4)	494 (2.1)	3 (0.4)	455 (11.5)
South Africa	37 (1.3)	289 (10.6)	63 (1.3)	251 (4.3)	58 (1.5)	281 (8.5)	42 (1.5)	245 (3.6)
Sweden	98 (0.3)	500 (2.6)	2 (0.3)	~ ~	98 (0.3)	500 (2.6)	2 (0.3)	~ ~
Tunisia	22 (1.4)	432 (4.5)	78 (1.4)	404 (2.0)	73 (1.2)	415 (2.4)	27 (1.2)	398 (2.5)
United States	93 (0.4)	509 (3.3)	7 (0.4)	453 (4.9)	86 (0.5)	510 (3.3)	14 (0.5)	475 (4.0)
‡ England	94 (0.5)	503 (5.1)	6 (0.5)	460 (8.1)	87 (1.0)	505 (4.9)	13 (1.0)	472 (6.4)
International Avg.	60 (0.2)	479 (0.7)	40 (0.2)	440 (0.9)	83 (0.1)	473 (0.6)	17 (0.1)	438 (1.0)
Benchmarking Participants								
Basque Country, Spain	89 (0.7)	490 (2.9)	11 (0.7)	464 (4.8)	93 (0.6)	489 (2.8)	7 (0.6)	462 (6.9)
Indiana State, US	92 (0.9)	511 (5.3)	8 (0.9)	479 (8.0)	84 (0.9)	512 (5.3)	16 (0.9)	490 (7.1)
Ontario Province, Can.	97 (0.4)	522 (3.0)	3 (0.4)	479 (9.1)	91 (0.7)	523 (3.0)	9 (0.7)	497 (5.4)
Quebec Province, Can.	93 (0.5)	545 (3.2)	7 (0.5)	520 (3.2)	91 (0.6)	545 (3.2)	9 (0.6)	528 (3.9)

Background data provided by students.

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

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit 4.5: Computer and Study Desk/Table in the Home

Countries	Have Computer		Do Not Have Computer		Have Study Desk/Table		Do Not Have Study Desk/Table	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Armenia	28 (1.2)	462 (4.5)	72 (1.2)	460 (3.8)	60 (1.5)	467 (3.9)	40 (1.5)	449 (4.2)
Australia	92 (0.9)	503 (3.8)	8 (0.9)	461 (7.1)	85 (1.1)	504 (3.6)	15 (1.1)	479 (6.8)
Belgium (Flemish)	90 (0.5)	553 (1.8)	10 (0.5)	534 (3.5)	91 (0.5)	551 (1.8)	9 (0.5)	547 (3.5)
Chinese Taipei	89 (0.7)	568 (1.8)	11 (0.7)	535 (3.0)	87 (0.6)	567 (1.8)	13 (0.6)	549 (3.0)
Cyprus	75 (0.7)	517 (2.6)	25 (0.7)	496 (3.5)	90 (0.5)	516 (2.4)	10 (0.5)	470 (4.3)
England	91 (0.6)	537 (3.8)	9 (0.6)	494 (5.4)	80 (1.1)	537 (3.9)	20 (1.1)	514 (5.0)
Hong Kong, SAR	85 (1.0)	577 (3.2)	15 (1.0)	565 (3.7)	71 (1.1)	574 (3.2)	29 (1.1)	578 (3.8)
Hungary	71 (1.2)	542 (3.0)	29 (1.2)	509 (4.1)	96 (0.5)	532 (2.9)	4 (0.5)	477 (10.5)
Iran, Islamic Rep. of	25 (1.7)	411 (5.4)	75 (1.7)	385 (4.3)	40 (1.8)	420 (4.3)	60 (1.8)	373 (4.7)
Italy	79 (0.7)	506 (3.4)	21 (0.7)	497 (5.6)	72 (0.9)	508 (3.8)	28 (0.9)	492 (4.5)
Japan	77 (0.8)	570 (1.8)	23 (0.8)	549 (2.5)	94 (0.4)	566 (1.6)	6 (0.4)	547 (5.5)
Latvia	42 (1.4)	545 (3.7)	58 (1.4)	533 (3.0)	91 (0.7)	537 (2.9)	9 (0.7)	526 (5.5)
Lithuania	45 (1.4)	548 (4.1)	55 (1.4)	526 (3.0)	97 (0.3)	537 (3.0)	3 (0.3)	503 (13.3)
Moldova, Rep. of	20 (1.1)	507 (6.9)	80 (1.1)	507 (4.8)	81 (1.2)	509 (5.1)	19 (1.2)	488 (5.8)
Morocco	r 20 (1.2)	354 (7.4)	r 80 (1.2)	352 (5.2)	r 52 (1.8)	361 (5.8)	r 48 (1.8)	344 (6.1)
Netherlands	93 (0.6)	543 (2.0)	7 (0.6)	511 (6.3)	94 (0.5)	542 (2.1)	6 (0.5)	524 (6.1)
New Zealand	87 (0.7)	502 (2.1)	13 (0.7)	464 (5.5)	80 (0.7)	501 (2.2)	20 (0.7)	475 (4.2)
Norway	91 (0.5)	458 (2.3)	9 (0.5)	412 (5.0)	92 (0.5)	458 (2.4)	8 (0.5)	405 (7.0)
Philippines	26 (1.7)	400 (16.5)	74 (1.7)	348 (5.8)	69 (1.3)	372 (7.8)	31 (1.3)	338 (9.5)
Russian Federation	23 (1.1)	540 (6.3)	77 (1.1)	530 (4.7)	83 (0.9)	535 (4.9)	17 (0.9)	521 (5.5)
Scotland	89 (0.8)	496 (3.2)	11 (0.8)	468 (5.1)	77 (1.1)	498 (3.1)	23 (1.1)	471 (4.7)
Singapore	89 (0.8)	601 (5.4)	11 (0.8)	546 (6.5)	90 (0.7)	600 (5.4)	10 (0.7)	547 (8.5)
Slovenia	77 (1.0)	492 (2.9)	23 (1.0)	454 (3.8)	91 (0.6)	480 (2.7)	9 (0.6)	474 (7.0)
Tunisia	26 (1.3)	365 (6.6)	74 (1.3)	336 (4.7)	64 (1.8)	357 (5.3)	36 (1.8)	325 (6.1)
United States	92 (0.4)	523 (2.3)	8 (0.4)	478 (4.2)	77 (0.8)	528 (2.3)	23 (0.8)	492 (3.3)
International Avg.	65 (0.2)	505 (1.1)	35 (0.2)	478 (0.9)	80 (0.2)	502 (0.8)	20 (0.2)	476 (1.2)
Benchmarking Participants								
Indiana State, US	90 (0.8)	537 (2.8)	10 (0.8)	505 (4.8)	80 (0.9)	538 (2.8)	20 (0.9)	517 (4.6)
Ontario Province, Can.	92 (0.6)	515 (3.9)	8 (0.6)	473 (6.0)	83 (1.1)	516 (3.9)	17 (1.1)	490 (4.2)
Quebec Province, Can.	89 (0.8)	509 (2.4)	11 (0.8)	484 (4.2)	86 (0.9)	511 (2.3)	14 (0.9)	480 (4.9)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

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

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit 4.6: Use of Computer

Countries	Use Computer Both at Home and at School		Use Computer at Home but Not at School		Use Computer at School but Not at Home	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Hong Kong, SAR	89 (0.7)	591 (2.9)	9 (0.6)	554 (8.1)	2 (0.2)	~ ~
Chinese Taipei	88 (0.9)	595 (4.4)	2 (0.2)	~ ~	9 (0.8)	509 (6.4)
Australia	83 (0.9)	512 (4.6)	10 (0.9)	498 (7.3)	5 (0.4)	447 (9.1)
Singapore	79 (0.7)	615 (3.4)	14 (0.5)	589 (4.5)	5 (0.4)	537 (7.9)
United States	79 (1.0)	515 (3.1)	11 (0.9)	481 (6.7)	8 (0.4)	452 (4.6)
Netherlands	78 (1.5)	542 (3.7)	19 (1.4)	526 (6.9)	1 (0.2)	~ ~
Sweden	78 (1.3)	505 (2.7)	17 (1.3)	488 (4.6)	3 (0.3)	463 (6.4)
Scotland	77 (1.1)	506 (3.8)	12 (0.9)	482 (5.8)	9 (0.6)	463 (5.5)
Israel	72 (1.8)	506 (3.6)	19 (1.6)	492 (5.1)	6 (0.5)	446 (8.9)
New Zealand	71 (1.4)	505 (5.9)	16 (1.3)	490 (5.4)	10 (0.7)	463 (7.9)
Norway	71 (1.5)	468 (2.6)	22 (1.4)	457 (4.4)	5 (0.5)	438 (6.4)
Cyprus	70 (0.7)	476 (1.5)	7 (0.5)	453 (5.3)	16 (0.6)	417 (4.3)
Belgium (Flemish)	64 (1.9)	544 (2.9)	26 (1.8)	536 (5.6)	4 (0.5)	478 (10.9)
Hungary	61 (1.4)	548 (3.0)	8 (1.0)	539 (8.6)	26 (1.1)	493 (5.2)
Japan	55 (1.3)	582 (3.1)	16 (1.1)	580 (6.7)	26 (0.8)	545 (2.8)
Slovenia	51 (1.5)	504 (3.0)	34 (1.7)	491 (2.9)	8 (0.8)	476 (4.6)
Estonia	41 (1.5)	539 (3.4)	24 (1.3)	544 (4.5)	24 (1.1)	516 (3.5)
Lebanon	39 (1.4)	459 (3.9)	16 (1.4)	416 (5.0)	21 (2.0)	426 (5.7)
Italy	39 (1.9)	498 (3.7)	39 (1.9)	491 (3.9)	9 (0.7)	445 (5.8)
Jordan	35 (1.5)	449 (6.3)	10 (0.8)	429 (7.7)	43 (1.5)	413 (3.7)
Korea, Rep. of	35 (1.6)	603 (2.7)	61 (1.7)	587 (2.7)	1 (0.2)	~ ~
Bahrain	31 (1.4)	418 (3.1)	45 (1.4)	403 (2.3)	8 (0.4)	383 (6.0)
Slovak Republic	26 (1.8)	537 (5.3)	33 (2.0)	519 (4.0)	16 (1.5)	486 (5.8)
Lithuania	26 (1.5)	523 (3.4)	22 (1.4)	524 (3.9)	35 (1.6)	482 (3.2)
Malaysia	26 (1.7)	538 (5.3)	26 (1.8)	527 (6.5)	24 (1.7)	491 (5.5)
Palestinian Nat'l Auth.	26 (1.5)	398 (5.3)	18 (1.3)	410 (5.4)	33 (1.6)	378 (3.9)
Latvia	25 (1.3)	536 (4.0)	16 (1.0)	516 (4.5)	42 (1.8)	503 (3.8)
Chile	22 (1.2)	445 (4.0)	11 (0.8)	416 (5.9)	49 (1.8)	364 (3.7)
Egypt	18 (0.7)	419 (5.5)	5 (0.5)	393 (8.9)	62 (1.4)	403 (3.5)
South Africa	16 (1.2)	286 (18.6)	11 (1.1)	309 (15.2)	18 (1.3)	250 (4.8)
Serbia	15 (1.3)	518 (5.1)	22 (1.6)	504 (4.3)	23 (2.0)	471 (4.0)
Moldova, Rep. of	15 (1.2)	459 (8.6)	4 (0.4)	454 (9.2)	63 (2.1)	461 (4.7)
Morocco	15 (1.1)	375 (5.2)	17 (1.1)	386 (4.9)	21 (1.7)	388 (5.1)
Romania	15 (1.7)	515 (6.9)	16 (1.2)	504 (6.4)	25 (2.1)	474 (7.3)
Macedonia, Rep. of	14 (1.2)	461 (6.7)	22 (1.5)	462 (6.3)	21 (2.0)	433 (4.7)
Russian Federation	12 (1.1)	542 (6.3)	19 (2.3)	528 (4.9)	28 (1.8)	505 (3.9)
Saudi Arabia	12 (1.5)	360 (11.9)	46 (2.0)	339 (4.6)	5 (0.8)	332 (6.4)
Philippines	11 (0.9)	411 (12.4)	7 (0.5)	377 (8.9)	24 (1.7)	396 (7.2)
Ghana	9 (0.7)	256 (7.6)	9 (0.7)	258 (10.3)	21 (1.6)	264 (8.0)
Armenia	7 (0.7)	482 (8.3)	14 (0.8)	478 (4.3)	15 (2.0)	488 (6.2)
Indonesia	7 (1.4)	476 (13.6)	2 (0.4)	~ ~	31 (3.2)	432 (6.6)
Tunisia	5 (0.5)	422 (5.6)	20 (1.4)	430 (5.1)	16 (1.5)	408 (3.3)
Bulgaria	5 (0.8)	505 (15.4)	22 (1.4)	502 (5.9)	8 (1.1)	459 (8.8)
Botswana	5 (0.7)	394 (15.8)	6 (0.5)	381 (9.3)	23 (2.5)	365 (3.8)
Iran, Islamic Rep. of	2 (0.6)	~ ~	17 (1.2)	443 (4.5)	1 (0.3)	~ ~
‡ England	81 (0.8)	508 (5.3)	10 (0.7)	480 (7.0)	7 (0.7)	459 (8.9)
International Avg.	39 (0.2)	485 (1.1)	18 (0.2)	470 (0.9)	19 (0.2)	441 (1.0)
Benchmarking Participants						
Basque Country, Spain	70 (2.1)	494 (2.9)	16 (1.9)	484 (5.5)	11 (0.8)	467 (4.5)
Indiana State, US	81 (1.3)	516 (5.5)	8 (0.9)	482 (7.0)	8 (0.9)	477 (5.8)
Ontario Province, Can.	85 (1.0)	525 (3.0)	11 (1.0)	510 (6.4)	3 (0.5)	473 (9.1)
Quebec Province, Can.	70 (1.9)	552 (3.7)	21 (1.8)	528 (3.8)	6 (0.6)	520 (4.3)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals 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.



Exhibit 4.6: Use of Computer

Countries	Use Computer Only at Places Other than Home and School		Do Not Use Computers at All	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Hong Kong, SAR	0 (0.1)	~ ~	0 (0.1)	~ ~
Chinese Taipei	0 (0.1)	~ ~	0 (0.1)	~ ~
Australia	1 (0.1)	~ ~	1 (0.2)	~ ~
Singapore	1 (0.1)	~ ~	1 (0.1)	~ ~
United States	1 (0.1)	~ ~	1 (0.1)	~ ~
Netherlands	0 (0.1)	~ ~	2 (0.3)	~ ~
Sweden	1 (0.2)	~ ~	2 (0.3)	~ ~
Scotland	1 (0.2)	~ ~	1 (0.2)	~ ~
Israel	2 (0.3)	~ ~	1 (0.1)	~ ~
New Zealand	2 (0.3)	~ ~	2 (0.3)	~ ~
Norway	1 (0.2)	~ ~	2 (0.2)	~ ~
Cyprus	2 (0.2)	~ ~	5 (0.4)	420 (5.3)
Belgium (Flemish)	5 (0.3)	527 (7.8)	1 (0.2)	~ ~
Hungary	2 (0.4)	~ ~	3 (0.4)	503 (9.2)
Japan	1 (0.2)	~ ~	2 (0.2)	~ ~
Slovenia	3 (0.4)	450 (6.8)	4 (0.4)	454 (7.7)
Estonia	6 (0.5)	515 (5.9)	4 (0.5)	501 (10.0)
Lebanon	14 (1.2)	408 (4.9)	10 (1.2)	417 (4.9)
Italy	5 (0.4)	448 (7.3)	9 (0.5)	456 (5.4)
Jordan	7 (0.8)	393 (6.9)	4 (0.5)	412 (7.7)
Korea, Rep. of	2 (0.2)	~ ~	0 (0.1)	~ ~
Bahrain	10 (0.6)	377 (4.7)	6 (0.4)	379 (6.5)
Slovak Republic	13 (0.8)	480 (3.6)	12 (1.1)	476 (4.8)
Lithuania	13 (1.0)	482 (4.2)	4 (0.6)	472 (10.3)
Malaysia	14 (1.0)	478 (5.1)	11 (1.1)	479 (5.1)
Palestinian Nat'l Auth.	13 (1.1)	379 (4.8)	10 (0.9)	397 (5.4)
Latvia	12 (0.9)	492 (5.7)	5 (0.7)	461 (8.0)
Chile	10 (0.7)	370 (4.5)	8 (0.6)	350 (4.9)
Egypt	8 (0.6)	393 (6.5)	7 (0.7)	437 (6.8)
South Africa	27 (1.3)	247 (5.5)	28 (2.0)	258 (5.4)
Serbia	19 (1.2)	451 (4.3)	20 (1.1)	453 (3.5)
Moldova, Rep. of	8 (0.8)	459 (7.7)	9 (1.4)	469 (7.3)
Morocco	28 (1.2)	393 (3.5)	20 (1.5)	393 (4.2)
Romania	24 (1.4)	460 (4.8)	20 (1.8)	453 (5.9)
Macedonia, Rep. of	32 (1.8)	429 (4.4)	10 (1.0)	405 (6.6)
Russian Federation	21 (1.1)	505 (5.7)	21 (1.7)	482 (5.7)
Saudi Arabia	12 (0.7)	311 (4.8)	25 (1.9)	321 (6.5)
Philippines	14 (0.9)	391 (7.5)	44 (1.6)	357 (5.1)
Ghana	26 (1.5)	285 (7.2)	34 (2.5)	291 (6.2)
Armenia	18 (1.1)	484 (5.0)	45 (2.1)	475 (3.0)
Indonesia	19 (1.3)	372 (7.4)	40 (2.8)	407 (6.9)
Tunisia	23 (1.1)	413 (2.6)	36 (1.7)	399 (2.3)
Bulgaria	40 (1.8)	465 (4.7)	24 (1.6)	473 (6.4)
Botswana	r 5 (0.4)	376 (7.3)	61 (2.5)	374 (2.9)
Iran, Islamic Rep. of	12 (0.8)	415 (4.5)	68 (1.7)	403 (2.5)
‡ England	1 (0.2)	~ ~	1 (0.2)	~ ~
International Avg.	10 (0.1)	422 (1.2)	14 (0.2)	420 (1.3)
Benchmarking Participants				
Basque Country, Spain	2 (0.5)	~ ~	1 (0.2)	~ ~
Indiana State, US	1 (0.3)	~ ~	1 (0.3)	~ ~
Ontario Province, Can.	0 (0.1)	~ ~	0 (0.1)	~ ~
Quebec Province, Can.	2 (0.2)	~ ~	1 (0.2)	~ ~

Background data provided by students.

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals 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.

Exhibit 4.6: Use of Computer

Countries	Use Computer Both at Home and at School		Use Computer at Home but Not at School		Use Computer at School but Not at Home	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Chinese Taipei	81 (1.5)	570 (1.7)	5 (1.3)	564 (5.3)	12 (0.7)	531 (2.8)
Australia	80 (1.6)	508 (3.7)	7 (0.8)	481 (6.7)	11 (1.1)	458 (8.5)
England	79 (1.0)	540 (3.9)	8 (0.6)	516 (7.5)	11 (0.8)	489 (5.2)
Netherlands	79 (2.0)	544 (1.9)	12 (1.7)	535 (4.7)	4 (0.4)	517 (10.6)
Scotland	78 (1.0)	497 (3.2)	8 (0.7)	463 (7.3)	12 (0.7)	470 (5.3)
Hong Kong, SAR	76 (1.3)	581 (3.2)	9 (0.9)	548 (5.6)	11 (0.9)	571 (4.6)
United States	73 (1.2)	530 (2.2)	12 (0.9)	503 (5.6)	11 (0.6)	477 (4.2)
Singapore	71 (1.4)	607 (5.4)	17 (1.0)	577 (5.7)	8 (0.6)	549 (8.4)
New Zealand	71 (1.1)	507 (2.2)	12 (0.8)	479 (5.6)	13 (0.7)	459 (5.2)
Belgium (Flemish)	66 (1.4)	556 (1.8)	21 (1.5)	547 (3.4)	6 (0.6)	538 (4.9)
Norway	60 (1.7)	461 (2.4)	28 (1.6)	456 (3.4)	5 (0.5)	416 (8.5)
Japan	54 (1.1)	578 (1.9)	9 (0.7)	566 (4.8)	31 (1.0)	547 (2.7)
Cyprus	36 (1.6)	522 (3.7)	27 (1.6)	519 (4.0)	16 (0.9)	493 (3.7)
Slovenia	33 (1.9)	483 (4.5)	46 (2.0)	487 (3.1)	6 (0.7)	463 (7.4)
Italy	30 (1.8)	511 (4.2)	38 (1.9)	506 (4.7)	12 (1.0)	487 (6.0)
Hungary	24 (2.1)	550 (5.3)	43 (2.1)	535 (3.5)	9 (1.0)	500 (7.8)
Morocco	16 (1.2)	339 (9.1)	25 (1.8)	355 (5.9)	7 (0.7)	336 (10.0)
Philippines	16 (2.0)	400 (25.4)	11 (0.8)	393 (9.5)	8 (0.7)	379 (19.2)
Lithuania	11 (1.2)	551 (7.2)	35 (1.5)	548 (4.0)	18 (1.6)	519 (5.1)
Latvia	10 (1.1)	545 (6.8)	27 (1.4)	546 (4.0)	17 (1.8)	536 (6.0)
Moldova, Rep. of	8 (0.8)	455 (12.1)	14 (1.1)	507 (8.4)	10 (1.4)	508 (7.2)
Tunisia	7 (0.8)	331 (10.5)	24 (1.4)	364 (6.4)	7 (1.1)	326 (10.0)
Armenia	6 (0.5)	441 (7.3)	30 (1.2)	454 (4.3)	9 (1.2)	455 (6.3)
Russian Federation	4 (0.6)	524 (13.9)	20 (1.0)	537 (6.7)	11 (1.6)	528 (7.7)
Iran, Islamic Rep. of	2 (0.4)	~ ~	11 (1.4)	437 (5.7)	2 (0.4)	~ ~
International Avg.	43 (0.3)	505 (1.6)	20 (0.3)	497 (1.2)	11 (0.2)	481 (1.6)
Benchmarking Participants						
Indiana State, US	79 (1.3)	540 (2.8)	8 (0.7)	508 (5.2)	10 (0.9)	512 (5.1)
Ontario Province, Can.	78 (2.0)	517 (3.9)	12 (1.6)	500 (8.1)	7 (0.6)	482 (5.4)
Quebec Province, Can.	75 (1.5)	511 (2.6)	12 (1.1)	495 (3.8)	10 (0.7)	493 (4.6)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals 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.

Exhibit 4.6: Use of Computer

Countries	Use Computer Only at Places Other than Home and School		Do Not Use Computers at All	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Chinese Taipei	0 (0.1)	~ ~	1 (0.1)	~ ~
Australia	1 (0.2)	~ ~	1 (0.1)	~ ~
England	1 (0.2)	~ ~	1 (0.2)	~ ~
Netherlands	1 (0.2)	~ ~	5 (0.5)	530 (7.0)
Scotland	1 (0.2)	~ ~	1 (0.2)	~ ~
Hong Kong, SAR	1 (0.2)	~ ~	2 (0.3)	~ ~
United States	2 (0.2)	~ ~	2 (0.1)	~ ~
Singapore	2 (0.2)	~ ~	2 (0.2)	~ ~
New Zealand	3 (0.3)	443 (8.1)	2 (0.3)	~ ~
Belgium (Flemish)	1 (0.2)	~ ~	5 (0.4)	541 (4.5)
Norway	2 (0.3)	~ ~	5 (0.6)	422 (7.9)
Japan	2 (0.3)	~ ~	3 (0.4)	542 (5.5)
Cyprus	8 (0.6)	481 (5.4)	14 (0.7)	504 (4.2)
Slovenia	5 (0.6)	448 (9.0)	12 (0.9)	464 (5.5)
Italy	8 (0.6)	490 (9.3)	12 (0.7)	497 (7.1)
Hungary	12 (0.8)	495 (5.7)	12 (0.8)	526 (4.8)
Morocco	15 (1.2)	353 (6.5)	37 (3.2)	353 (7.3)
Philippines	9 (0.8)	374 (10.6)	56 (2.5)	341 (5.7)
Lithuania	24 (1.1)	532 (3.7)	13 (1.0)	527 (5.1)
Latvia	25 (1.5)	532 (4.0)	22 (1.6)	530 (4.0)
Moldova, Rep. of	25 (1.6)	517 (6.7)	43 (2.5)	512 (6.5)
Tunisia	15 (1.1)	376 (6.3)	46 (2.1)	323 (6.3)
Armenia	24 (1.0)	456 (4.8)	32 (1.5)	468 (5.0)
Russian Federation	30 (1.4)	531 (5.9)	35 (1.6)	534 (4.8)
Iran, Islamic Rep. of	8 (0.9)	407 (6.6)	76 (1.9)	382 (4.3)
International Avg.	9 (0.2)	460 (1.8)	18 (0.3)	470 (1.4)
Benchmarking Participants				
Indiana State, US	1 (0.2)	~ ~	2 (0.3)	~ ~
Ontario Province, Can.	2 (0.4)	~ ~	1 (0.2)	~ ~
Quebec Province, Can.	1 (0.2)	~ ~	2 (0.3)	~ ~

Background data provided by students.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals 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.

but not at school, 19 percent using one at school but not at home, and 10 percent at some other place. Fourteen percent of eighth-grade students reported that they do not use a computer at all. At fourth grade, the results were similar to the eighth grade. Forty-three percent of the fourth-grade students reported using a computer both at home and at school, 20 percent at home but not at school, 11 percent at school but not at home, and 9 percent some other place. Eighteen percent reported that they did not use a computer at all.

Interestingly, at both grades, the data indicate that students were somewhat more likely to use a computer at home than at school. Also, it should be highlighted that at both grades percentages of students reporting that they did not use a computer at all varied dramatically across countries. For example at the eighth grade, it varied from 0 percent in several countries (Hong Kong SAR and Chinese Taipei) to about one-third (34 to 45%) in the Philippines, Ghana, Armenia, Indonesia, and Tunisia to about two-thirds (61-68%) in Botswana and Iran.

Mathematics achievement was positively related to computer usage, particularly at eighth grade, with average achievement highest among students reporting using computers at home and at school (485 points). Next highest was achievement among students using computers at home but not school (470 points), followed by students using computers at school but not home (441 points). Countries with the greatest percentages of eighth-grade students using computers at home and at school included Hong Kong SAR, Chinese Taipei, Australia, England, and Indiana (80% or more), as well as Singapore, the United States, the Netherlands, Sweden, Scotland, Israel, New Zealand, Norway, and Cyprus (70% or more). At the fourth grade, countries with the greatest percentages (80% or more) of students using computers at home and at school included Chinese Taipei and Australia, as well as England, the Netherlands, Scotland, Hong Kong SAR, the United States, Singapore, and New Zealand.

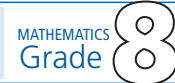
How Much of Their Out-of-School Time Do Students Spend on Homework During the School Week?

One of the major ways that students can consolidate and extend classroom learning is to spend time out of school studying or doing homework in school subjects. Well-chosen homework assignments can reinforce classroom learning, and, by providing a challenge, can encourage students to extend their understanding of the subject matter. Homework also provides students who are having trouble keeping up with their classmates an opportunity to review material taught in class.

To summarize the amount of time typically devoted to mathematics homework in each country, TIMSS constructed an index of the time students spend doing mathematics homework that assigns students to a high, medium, or low level on the basis of the frequency and amount of mathematics homework they are assigned each week. Students at the high level reported that they were assigned more than 30 minutes of mathematics homework at least 3-4 times per week. Students at the low level were reportedly assigned not more than 30 minutes of mathematics homework twice per week. The middle level included all other response combinations.

Exhibit 4.7 presents the percentages of eighth- and fourth-grade students at the various levels of this index across countries, and their average mathematics achievement. Countries are ordered by the percentage of students at the high level of the index. At the eighth grade across countries, on average, 26 percent of students were at the high level of the *time spent on mathematics homework* index, 54 percent at the medium level, and 19 percent at the low level. Students at the low level, on average, had lower achievement than the students in the high and medium categories. Countries with the greatest emphasis on homework the eighth grade included Romania, Italy, and the Russian Federation, where 50 percent or more of the students were at the high level of the index. In these countries, homework seems to be an important part of teachers' instructional strategy. In contrast, there seems to be relatively little emphasis on homework in Scotland, Japan, Sweden,

Exhibit 4.7: Index of Time Students Spend Doing Mathematics Homework (TMH) in a Normal School Week



Index of Time Students Spend Doing Mathematics Homework

Index based on students reports on the frequency and amount of mathematics homework they are given. High level indicates more than 30 minutes of mathematics homework assigned 3-4 times a week. Low level indicates no more than 30 minutes of mathematics homework no more than twice a week. Medium level includes all other possible combinations of responses.

Countries	High TMH		Medium TMH		Low TMH	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Romania	68 (1.6)	492 (4.5)	28 (1.4)	451 (6.4)	3 (0.4)	437 (13.0)
Italy	54 (1.4)	484 (3.8)	40 (1.1)	487 (3.6)	7 (0.7)	471 (8.0)
Russian Federation	53 (1.2)	509 (4.4)	45 (1.2)	511 (3.4)	2 (0.2)	~ ~
Lebanon	42 (1.7)	436 (3.5)	52 (1.7)	437 (3.5)	5 (0.6)	412 (7.6)
Tunisia	39 (1.1)	410 (2.7)	50 (1.1)	414 (2.2)	11 (0.9)	414 (4.3)
Moldova, Rep. of	38 (1.4)	472 (4.3)	57 (1.3)	458 (4.6)	5 (0.5)	437 (8.3)
Singapore	38 (1.1)	621 (3.1)	51 (0.9)	604 (3.8)	11 (0.8)	566 (7.8)
Indonesia	37 (1.1)	435 (4.3)	48 (0.8)	406 (5.3)	15 (0.8)	391 (7.3)
Armenia	35 (1.3)	490 (3.9)	60 (1.2)	478 (3.7)	4 (0.4)	475 (7.5)
Morocco ^r	34 (1.5)	390 (4.5)	52 (1.1)	392 (3.2)	14 (1.0)	380 (4.8)
Israel	33 (1.4)	498 (3.9)	55 (1.3)	505 (4.1)	12 (0.9)	479 (6.3)
Malaysia	33 (1.3)	515 (4.4)	56 (1.1)	510 (4.5)	11 (0.8)	485 (5.9)
Latvia	33 (1.3)	502 (4.7)	61 (1.3)	516 (3.0)	6 (0.7)	508 (9.3)
Bulgaria	33 (1.8)	482 (6.4)	54 (1.5)	478 (4.6)	14 (1.5)	469 (5.4)
Hong Kong, SAR	32 (1.9)	600 (3.5)	49 (1.5)	587 (3.6)	19 (1.5)	566 (7.6)
Lithuania	32 (1.4)	493 (3.1)	63 (1.3)	509 (3.0)	5 (0.8)	490 (8.7)
United States	31 (1.0)	518 (4.1)	60 (0.9)	506 (3.2)	9 (0.9)	461 (6.3)
Estonia	28 (1.3)	519 (4.0)	66 (1.3)	538 (3.2)	7 (1.2)	523 (10.3)
Palestinian Nat'l Auth.	27 (1.1)	393 (3.5)	65 (1.1)	398 (3.5)	8 (0.6)	371 (6.6)
Egypt	26 (0.8)	402 (4.3)	60 (1.0)	418 (3.6)	14 (0.7)	419 (4.7)
Macedonia, Rep. of	26 (1.1)	440 (4.5)	61 (1.3)	444 (3.9)	13 (1.3)	439 (6.0)
Norway	26 (1.3)	454 (4.0)	52 (1.3)	466 (2.5)	22 (1.3)	472 (3.5)
Slovenia	25 (1.1)	482 (2.9)	71 (1.2)	500 (2.5)	4 (0.8)	463 (8.8)
Botswana	25 (0.8)	385 (3.9)	53 (0.8)	368 (2.6)	22 (0.9)	355 (3.0)
Serbia	25 (1.3)	466 (4.1)	54 (1.2)	481 (3.5)	20 (1.7)	497 (3.5)
Jordan	25 (0.8)	425 (4.7)	64 (1.1)	437 (4.1)	11 (0.9)	411 (4.9)
Ghana	24 (0.9)	288 (5.8)	56 (0.9)	280 (4.5)	20 (1.0)	275 (7.5)
Philippines	24 (0.9)	390 (5.4)	54 (1.0)	382 (5.5)	22 (1.2)	361 (6.6)
Iran, Islamic Rep. of	24 (1.2)	420 (3.8)	52 (0.9)	414 (2.8)	25 (1.1)	403 (3.4)
South Africa	21 (0.8)	275 (8.1)	58 (0.8)	270 (6.3)	20 (1.0)	260 (5.4)
Cyprus	21 (0.8)	459 (2.8)	70 (0.7)	469 (1.8)	9 (0.6)	438 (5.3)
Hungary	20 (1.2)	516 (5.8)	77 (1.2)	537 (3.1)	3 (0.5)	501 (14.1)
Australia	19 (1.6)	520 (6.0)	50 (1.5)	509 (5.4)	31 (2.0)	497 (5.5)
Netherlands	19 (1.3)	540 (5.2)	62 (1.4)	542 (4.4)	19 (1.7)	518 (6.5)
Chinese Taipei	18 (1.5)	611 (6.0)	45 (1.2)	594 (4.4)	37 (2.0)	563 (5.6)
Bahrain	18 (0.8)	387 (3.3)	69 (1.2)	409 (2.0)	13 (1.1)	398 (4.9)
Saudi Arabia	15 (1.0)	315 (8.1)	62 (1.6)	335 (4.6)	23 (1.6)	345 (5.7)
New Zealand	14 (1.1)	488 (5.1)	49 (1.8)	505 (6.0)	37 (2.1)	492 (7.2)
Belgium (Flemish)	13 (1.1)	542 (4.5)	42 (1.4)	546 (3.2)	44 (2.0)	532 (3.7)
Korea, Rep. of	11 (1.0)	582 (4.3)	46 (1.6)	592 (2.6)	43 (2.0)	590 (2.8)
Slovak Republic	11 (0.9)	495 (6.4)	81 (1.4)	511 (3.4)	8 (1.3)	500 (7.7)
Chile	10 (0.7)	387 (6.9)	43 (1.0)	389 (3.8)	47 (1.4)	388 (3.7)
Scotland	8 (0.8)	493 (5.8)	46 (2.1)	507 (4.5)	46 (2.5)	496 (4.1)
Japan	6 (0.7)	565 (10.1)	36 (1.5)	566 (2.8)	58 (1.9)	576 (2.1)
Sweden	4 (0.5)	453 (7.0)	38 (1.4)	494 (3.5)	58 (1.5)	509 (2.7)
‡ England	7 (1.2)	509 (7.0)	37 (1.5)	507 (5.3)	56 (1.9)	498 (5.8)
International Avg.	26 (0.2)	468 (0.8)	54 (0.2)	471 (0.6)	19 (0.2)	456 (1.0)
Benchmarking Participants						
Basque Country, Spain	31 (1.9)	481 (3.2)	60 (1.8)	493 (3.1)	9 (1.2)	483 (6.9)
Indiana State, US	31 (2.7)	514 (7.5)	65 (2.5)	510 (4.7)	5 (0.7)	458 (9.3)
Ontario Province, Can.	24 (1.2)	515 (5.1)	71 (1.4)	526 (3.0)	6 (0.9)	496 (8.1)
Quebec Province, Can.	29 (1.7)	548 (4.3)	53 (1.6)	545 (3.5)	19 (2.0)	536 (4.5)

Background data provided by students.

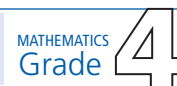
‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals 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.

Exhibit 4.7: Index of Time Students Spend Doing Mathematics Homework (TMH) in a Normal School Week



Countries	High TMH		Medium TMH		Low TMH	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Singapore	40 (1.5)	604 (6.0)	49 (1.3)	595 (5.8)	11 (0.6)	575 (7.2)
Russian Federation	38 (1.3)	531 (5.3)	59 (1.2)	537 (4.7)	2 (0.4)	~ ~
Armenia ^r	33 (1.3)	467 (5.1)	65 (1.3)	465 (3.5)	2 (0.3)	~ ~
Moldova, Rep. of	31 (2.0)	518 (6.3)	66 (1.9)	504 (5.4)	3 (0.6)	494 (10.9)
Iran, Islamic Rep. of	31 (2.3)	404 (5.1)	52 (1.8)	391 (5.0)	17 (2.3)	376 (8.1)
Lithuania	29 (1.2)	527 (3.8)	66 (1.3)	545 (3.1)	5 (0.6)	510 (10.7)
Latvia	25 (1.1)	525 (4.1)	71 (1.1)	546 (2.7)	4 (0.6)	517 (9.1)
Hong Kong, SAR	24 (1.0)	575 (3.8)	71 (0.9)	580 (3.2)	5 (0.5)	530 (5.6)
Italy	24 (1.1)	496 (5.2)	52 (1.1)	504 (4.5)	24 (1.6)	512 (3.6)
Morocco ^s	22 (1.3)	362 (5.9)	58 (1.9)	365 (4.8)	20 (2.1)	353 (12.3)
Tunisia ^s	22 (2.2)	373 (8.6)	50 (2.8)	365 (6.3)	28 (3.0)	365 (8.0)
Hungary	17 (0.9)	515 (4.9)	78 (1.1)	538 (3.1)	5 (0.9)	535 (10.6)
Philippines	17 (0.8)	349 (7.0)	52 (1.7)	362 (6.7)	31 (1.9)	372 (15.7)
Cyprus	14 (0.6)	494 (4.6)	76 (0.9)	521 (2.4)	10 (0.6)	497 (5.3)
Slovenia	14 (0.9)	466 (6.7)	76 (1.2)	490 (2.6)	10 (0.9)	455 (8.6)
United States	12 (0.6)	504 (4.0)	63 (1.3)	524 (2.7)	25 (1.5)	520 (3.5)
Norway	12 (1.0)	447 (4.7)	56 (1.8)	462 (3.2)	32 (2.1)	467 (4.0)
Chinese Taipei	11 (0.6)	546 (3.5)	62 (1.1)	569 (2.0)	27 (1.2)	561 (2.7)
Belgium (Flemish)	9 (0.7)	538 (3.9)	48 (1.7)	549 (2.7)	43 (2.0)	557 (2.0)
Japan	8 (0.6)	543 (4.6)	57 (1.8)	568 (2.3)	35 (2.1)	565 (2.7)
New Zealand	7 (0.4)	489 (6.7)	41 (1.1)	491 (3.3)	52 (1.3)	504 (3.1)
Australia	7 (0.8)	486 (13.0)	43 (2.1)	500 (4.6)	50 (2.1)	505 (4.4)
Scotland	6 (0.8)	477 (6.8)	40 (2.0)	488 (4.2)	54 (2.2)	498 (3.4)
England	4 (0.6)	489 (14.3)	37 (1.8)	531 (4.8)	59 (1.9)	540 (4.2)
Netherlands	1 (0.2)	~ ~	10 (0.8)	508 (6.6)	89 (0.9)	546 (1.8)
International Avg.	18 (0.2)	489 (1.3)	56 (0.3)	500 (0.9)	26 (0.3)	494 (1.6)
Benchmarking Participants						
Indiana State, US	15 (1.6)	531 (5.6)	65 (2.6)	537 (2.7)	21 (3.0)	525 (5.9)
Ontario Province, Can.	16 (0.9)	514 (6.3)	53 (1.7)	511 (3.4)	31 (2.0)	513 (6.4)
Quebec Province, Can.	10 (0.9)	487 (3.8)	44 (1.5)	505 (2.9)	46 (1.7)	514 (3.0)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals 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. An "s" indicates data are available for at least 50 but less than 70% of the students.

Exhibit 4.8 How Students Spend Their Leisure Time on a Normal School Day

Countries	Average Hours Spent Each Day*								
	Watch Television and Videos	Play Computer Games	Play or Talk with Friends	Do Jobs at Home	Play Sports	Read a Book for Enjoyment	Use the Internet	Work at a Paid Job	
Armenia	1.8 (0.03)	r 0.9 (0.03)	r 1.6 (0.03)	r 0.4 (0.02)	r 1.2 (0.03)	r 1.6 (0.03)	r 0.7 (0.03)	r 1.0 (0.04)	
Australia	2.0 (0.03)	0.9 (0.02)	1.7 (0.04)	1.0 (0.02)	1.6 (0.03)	0.7 (0.02)	1.3 (0.04)	0.4 (0.03)	
Bahrain	2.0 (0.03)	1.2 (0.02)	1.6 (0.03)	1.2 (0.02)	1.5 (0.03)	0.9 (0.02)	1.4 (0.03)	0.6 (0.02)	
Belgium (Flemish)	2.1 (0.03)	1.0 (0.03)	1.9 (0.03)	0.9 (0.02)	1.6 (0.03)	0.5 (0.01)	1.3 (0.03)	0.2 (0.02)	
Botswana	1.4 (0.03)	0.5 (0.02)	2.1 (0.04)	2.3 (0.03)	1.5 (0.02)	1.8 (0.03)	0.7 (0.02)	0.6 (0.03)	
Bulgaria	2.5 (0.04)	1.1 (0.04)	2.6 (0.05)	1.5 (0.03)	1.2 (0.04)	0.7 (0.03)	1.0 (0.04)	0.3 (0.02)	
Chile	2.2 (0.02)	0.7 (0.02)	2.3 (0.02)	1.5 (0.02)	1.8 (0.03)	0.6 (0.01)	0.7 (0.02)	0.3 (0.02)	
Chinese Taipei	1.7 (0.03)	1.4 (0.04)	1.4 (0.03)	0.7 (0.01)	1.0 (0.02)	1.0 (0.02)	1.4 (0.04)	0.2 (0.01)	
Cyprus	2.1 (0.03)	1.3 (0.02)	2.1 (0.03)	1.0 (0.03)	1.7 (0.03)	0.9 (0.02)	1.2 (0.02)	0.6 (0.02)	
Egypt	0.8 (0.02)	0.7 (0.02)	0.8 (0.02)	1.3 (0.03)	1.1 (0.02)	1.0 (0.02)	0.6 (0.02)	0.6 (0.02)	
Estonia	2.3 (0.03)	1.1 (0.03)	2.8 (0.03)	1.1 (0.02)	1.4 (0.03)	0.7 (0.02)	1.5 (0.04)	0.4 (0.02)	
Ghana	0.7 (0.02)	0.6 (0.02)	1.2 (0.03)	1.5 (0.03)	1.3 (0.02)	1.7 (0.03)	0.8 (0.03)	0.8 (0.03)	
Hong Kong, SAR	2.3 (0.03)	2.0 (0.04)	1.6 (0.03)	0.7 (0.01)	1.0 (0.02)	1.1 (0.02)	2.0 (0.03)	0.1 (0.01)	
Hungary	2.1 (0.03)	1.1 (0.03)	2.2 (0.03)	1.1 (0.02)	1.5 (0.03)	0.8 (0.02)	0.6 (0.03)	0.2 (0.02)	
Indonesia	1.5 (0.03)	0.5 (0.02)	1.3 (0.03)	2.2 (0.03)	1.1 (0.02)	1.1 (0.02)	0.3 (0.02)	0.8 (0.03)	
Iran, Islamic Rep. of	1.6 (0.03)	0.4 (0.02)	1.4 (0.03)	1.5 (0.03)	1.4 (0.04)	1.0 (0.02)	0.2 (0.02)	0.7 (0.05)	
Israel	2.5 (0.04)	1.9 (0.03)	2.3 (0.03)	1.4 (0.03)	1.6 (0.03)	0.9 (0.02)	1.8 (0.04)	0.6 (0.02)	
Italy	1.8 (0.03)	1.0 (0.02)	2.6 (0.03)	1.1 (0.03)	1.8 (0.03)	0.7 (0.02)	0.6 (0.02)	0.9 (0.02)	
Japan	2.7 (0.03)	0.9 (0.02)	1.6 (0.04)	0.6 (0.01)	1.3 (0.03)	0.9 (0.02)	0.6 (0.02)	0.1 (0.01)	
Jordan	1.5 (0.03)	0.9 (0.03)	1.2 (0.03)	1.3 (0.03)	1.2 (0.03)	0.9 (0.02)	0.6 (0.03)	0.6 (0.03)	
Korea, Rep. of	1.7 (0.03)	1.5 (0.03)	1.8 (0.03)	0.7 (0.01)	0.7 (0.02)	0.6 (0.01)	1.7 (0.03)	0.1 (0.01)	
Latvia	2.4 (0.03)	1.0 (0.02)	2.8 (0.03)	1.6 (0.03)	1.3 (0.03)	0.8 (0.03)	0.8 (0.03)	0.5 (0.02)	
Lebanon	1.8 (0.04)	1.3 (0.03)	1.6 (0.04)	1.3 (0.03)	1.6 (0.03)	1.0 (0.02)	1.0 (0.03)	0.8 (0.03)	
Lithuania	2.1 (0.03)	1.1 (0.03)	2.6 (0.04)	1.6 (0.04)	1.1 (0.03)	0.6 (0.02)	0.7 (0.03)	0.3 (0.02)	
Macedonia, Rep. of	2.3 (0.04)	1.3 (0.03)	2.2 (0.03)	1.6 (0.03)	1.8 (0.03)	1.0 (0.02)	0.9 (0.03)	0.7 (0.03)	
Malaysia	2.1 (0.04)	0.8 (0.03)	1.5 (0.03)	1.7 (0.02)	1.1 (0.02)	1.2 (0.02)	0.6 (0.02)	0.3 (0.02)	
Moldova, Rep. of	1.9 (0.04)	0.7 (0.03)	2.0 (0.04)	2.2 (0.06)	1.3 (0.03)	1.1 (0.03)	0.7 (0.03)	0.5 (0.03)	
Morocco	1.3 (0.04)	2.3 (0.06)	1.3 (0.03)	1.8 (0.03)	1.5 (0.03)	r 1.3 (0.03)	r 2.6 (0.06)	r 2.8 (0.06)	
Netherlands	2.1 (0.05)	1.2 (0.04)	2.0 (0.05)	0.8 (0.02)	1.7 (0.04)	0.5 (0.02)	1.5 (0.04)	0.8 (0.05)	
New Zealand	2.1 (0.04)	1.0 (0.04)	1.8 (0.05)	1.0 (0.02)	1.5 (0.03)	0.7 (0.03)	1.3 (0.04)	0.6 (0.03)	
Norway	2.2 (0.03)	1.2 (0.03)	2.7 (0.03)	1.0 (0.03)	1.8 (0.03)	0.6 (0.02)	1.2 (0.03)	0.7 (0.02)	
Palestinian Nat'l Auth.	1.2 (0.02)	0.7 (0.02)	1.3 (0.03)	1.5 (0.03)	1.1 (0.03)	1.0 (0.02)	0.5 (0.02)	0.6 (0.03)	
Philippines	1.6 (0.04)	0.6 (0.02)	1.7 (0.03)	1.9 (0.03)	1.4 (0.02)	1.2 (0.02)	0.5 (0.03)	0.8 (0.04)	
Romania	2.0 (0.04)	0.9 (0.03)	2.1 (0.03)	1.7 (0.05)	1.3 (0.03)	1.0 (0.03)	0.8 (0.04)	0.5 (0.04)	
Russian Federation	2.0 (0.03)	1.0 (0.03)	2.5 (0.04)	1.6 (0.03)	1.3 (0.02)	1.1 (0.03)	0.4 (0.02)	0.2 (0.02)	
Saudi Arabia	1.6 (0.05)	1.1 (0.03)	1.3 (0.03)	1.5 (0.04)	1.2 (0.04)	0.9 (0.02)	0.8 (0.05)	0.8 (0.03)	
Scotland	2.2 (0.03)	1.4 (0.04)	2.7 (0.03)	0.8 (0.02)	1.7 (0.03)	0.6 (0.02)	1.4 (0.03)	0.5 (0.03)	
Serbia	2.1 (0.03)	1.0 (0.03)	2.1 (0.03)	1.3 (0.03)	1.7 (0.03)	0.8 (0.02)	0.6 (0.03)	0.3 (0.02)	
Singapore	2.3 (0.02)	1.4 (0.02)	1.7 (0.02)	0.7 (0.02)	1.4 (0.02)	0.9 (0.02)	1.6 (0.02)	0.2 (0.02)	
Slovak Republic	2.5 (0.03)	1.1 (0.03)	2.8 (0.03)	1.5 (0.03)	1.9 (0.04)	0.9 (0.02)	0.6 (0.03)	0.4 (0.02)	
Slovenia	2.2 (0.03)	1.3 (0.03)	2.0 (0.03)	1.2 (0.03)	1.7 (0.03)	0.8 (0.02)	1.1 (0.03)	0.4 (0.02)	
South Africa	1.5 (0.03)	0.7 (0.02)	2.0 (0.03)	1.8 (0.03)	1.6 (0.02)	1.6 (0.03)	0.8 (0.02)	0.8 (0.02)	
Sweden	2.1 (0.03)	1.1 (0.03)	2.8 (0.03)	1.0 (0.02)	1.6 (0.03)	0.6 (0.02)	1.7 (0.04)	0.4 (0.02)	
Tunisia	1.4 (0.02)	0.8 (0.03)	1.5 (0.02)	1.9 (0.03)	1.5 (0.02)	1.3 (0.02)	0.7 (0.02)	0.6 (0.02)	
United States	2.2 (0.03)	1.1 (0.02)	2.4 (0.03)	1.2 (0.02)	1.8 (0.02)	0.7 (0.01)	1.8 (0.03)	0.6 (0.02)	
‡ England	2.0 (0.04)	1.1 (0.04)	2.4 (0.05)	0.8 (0.03)	1.4 (0.05)	0.5 (0.02)	1.4 (0.04)	0.5 (0.04)	
International Avg.	1.9 (0.00)	1.1 (0.00)	1.9 (0.00)	1.3 (0.00)	1.4 (0.00)	0.9 (0.00)	1.0 (0.00)	0.6 (0.00)	
Benchmarking Participants									
Basque Country, Spain	1.6 (0.04)	0.9 (0.03)	2.4 (0.04)	0.9 (0.03)	1.5 (0.03)	0.7 (0.02)	0.8 (0.03)	0.4 (0.03)	
Indiana State, US	2.2 (0.06)	1.0 (0.04)	2.4 (0.06)	1.2 (0.04)	1.8 (0.04)	0.7 (0.03)	1.7 (0.04)	0.6 (0.05)	
Ontario Province, Can.	2.1 (0.04)	1.2 (0.04)	2.0 (0.04)	0.9 (0.02)	1.7 (0.03)	0.8 (0.02)	1.9 (0.04)	0.6 (0.03)	
Quebec Province, Can.	2.0 (0.03)	1.4 (0.03)	2.0 (0.04)	0.9 (0.02)	1.7 (0.04)	0.6 (0.02)	1.5 (0.04)	0.6 (0.02)	

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

* Number of hours based on: No time = 0; Less than 1 hour = 0.5; 1-2 hours = 1.5; More than 2 but less than 4 hours = 3; 4 or more hours = 4.5. Activities are not necessarily exclusive; students may have reported engaging in more than one activity at the same time.

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

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

Exhibit 4.8: How Students Spend Their Leisure Time on a Normal School Day

Countries	Average Hours Spent Each Day*						
	Watch Television and Videos	Play Computer Games	Play or Talk with Friends	Do Jobs at Home	Play Sports	Read a Book for Enjoyment	Use the Internet
Armenia	r 1.6 (0.04)	r 1.0 (0.04)	r 1.3 (0.03)	s 0.5 (0.05)	r 1.4 (0.03)	r 1.9 (0.04)	s 0.5 (0.04)
Australia	1.9 (0.04)	1.1 (0.03)	1.8 (0.04)	1.3 (0.03)	1.8 (0.04)	1.2 (0.03)	0.9 (0.04)
Belgium (Flemish)	1.8 (0.03)	1.0 (0.02)	2.0 (0.03)	1.2 (0.02)	1.6 (0.03)	0.9 (0.02)	0.8 (0.02)
Chinese Taipei	1.3 (0.03)	1.0 (0.03)	1.0 (0.02)	0.9 (0.02)	1.3 (0.02)	1.1 (0.02)	1.0 (0.03)
Cyprus	1.9 (0.03)	1.1 (0.03)	2.1 (0.03)	1.3 (0.03)	1.7 (0.03)	1.2 (0.02)	0.6 (0.02)
England	2.0 (0.04)	1.5 (0.04)	2.1 (0.04)	1.0 (0.03)	1.9 (0.03)	1.0 (0.03)	1.0 (0.03)
Hong Kong, SAR	1.9 (0.03)	1.2 (0.03)	1.2 (0.03)	0.9 (0.02)	1.1 (0.02)	1.0 (0.02)	0.9 (0.03)
Hungary	1.9 (0.03)	1.2 (0.03)	2.2 (0.03)	1.3 (0.03)	1.7 (0.03)	1.0 (0.02)	0.4 (0.02)
Iran, Islamic Rep. of	1.1 (0.04)	0.3 (0.03)	1.2 (0.05)	1.6 (0.05)	1.4 (0.04)	1.3 (0.04)	0.2 (0.02)
Italy	1.4 (0.03)	0.8 (0.02)	1.9 (0.03)	1.3 (0.03)	1.6 (0.02)	0.9 (0.02)	0.4 (0.02)
Japan	2.0 (0.03)	0.9 (0.02)	1.9 (0.03)	0.8 (0.02)	1.3 (0.02)	0.8 (0.02)	0.4 (0.01)
Latvia	2.0 (0.04)	0.9 (0.03)	2.6 (0.04)	1.7 (0.04)	1.5 (0.03)	1.1 (0.03)	0.5 (0.03)
Lithuania	1.7 (0.04)	1.1 (0.03)	2.7 (0.03)	1.8 (0.04)	1.2 (0.03)	1.1 (0.02)	0.5 (0.02)
Moldova, Rep. of	1.6 (0.04)	r 0.6 (0.03)	1.8 (0.05)	1.9 (0.05)	1.2 (0.03)	1.2 (0.03)	r 0.4 (0.03)
Morocco	r 1.0 (0.05)	r 0.8 (0.05)	r 1.2 (0.05)	r 1.3 (0.04)	r 1.2 (0.04)	r 1.1 (0.05)	r 0.8 (0.04)
Netherlands	1.6 (0.04)	1.2 (0.03)	2.4 (0.05)	0.9 (0.03)	1.7 (0.04)	0.8 (0.03)	0.8 (0.04)
New Zealand	1.9 (0.03)	1.1 (0.03)	1.8 (0.03)	1.3 (0.03)	1.6 (0.03)	1.3 (0.03)	1.0 (0.02)
Norway	1.5 (0.02)	1.0 (0.02)	2.4 (0.04)	1.1 (0.02)	1.5 (0.03)	1.0 (0.03)	0.6 (0.02)
Philippines	1.2 (0.04)	0.8 (0.03)	1.3 (0.03)	1.5 (0.05)	1.4 (0.04)	1.4 (0.04)	0.7 (0.04)
Russian Federation	1.5 (0.03)	0.8 (0.03)	2.2 (0.04)	1.5 (0.03)	1.2 (0.03)	1.2 (0.02)	0.3 (0.02)
Scotland	2.0 (0.04)	1.6 (0.04)	2.1 (0.04)	1.1 (0.03)	2.0 (0.04)	1.0 (0.02)	1.1 (0.03)
Singapore	2.0 (0.02)	1.2 (0.02)	1.2 (0.02)	1.0 (0.03)	1.5 (0.03)	1.3 (0.02)	0.9 (0.02)
Slovenia	1.6 (0.05)	1.3 (0.04)	1.7 (0.04)	1.5 (0.04)	1.9 (0.04)	1.2 (0.03)	0.6 (0.02)
Tunisia	r 0.8 (0.03)	r 0.8 (0.04)	r 0.9 (0.04)	r 1.5 (0.04)	r 1.4 (0.04)	r 1.3 (0.05)	r 0.8 (0.05)
United States	2.1 (0.03)	1.1 (0.02)	2.0 (0.02)	1.2 (0.01)	1.9 (0.02)	1.2 (0.02)	1.2 (0.02)
International Avg.	1.7 (0.01)	1.0 (0.01)	1.8 (0.01)	1.3 (0.01)	1.5 (0.01)	1.1 (0.01)	0.7 (0.01)
Benchmarking Participants							
Indiana State, US	2.0 (0.04)	1.1 (0.03)	2.2 (0.03)	1.1 (0.03)	2.0 (0.03)	1.1 (0.03)	1.2 (0.04)
Ontario Province, Can.	2.0 (0.04)	1.2 (0.04)	1.8 (0.05)	1.2 (0.02)	1.7 (0.04)	1.2 (0.03)	1.2 (0.03)
Quebec Province, Can.	1.8 (0.03)	1.2 (0.03)	2.0 (0.04)	1.4 (0.03)	2.2 (0.03)	1.0 (0.02)	1.2 (0.03)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

* Number of hours based on: No time = 0; Less than 1 hour = 0.5; 1-2 hours = 1.5; More than 2 but less than 4 hours = 3; 4 or more hours = 4.5. Activities are not necessarily exclusive; students may have reported engaging in more than one activity at the same time.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students.

and England, where less than ten percent of students were at the high level of the index.

In general, fourth-grade students reported being given less mathematics homework than did students at the eighth grade. Eighteen percent of fourth-grade students, on average, were at the high level of the index, 56 percent at the middle level, and 26 percent at the low level. Singapore was the country with the highest percentage of students in the high category—40 percent. Despite this, across countries, fourth-grade students in the medium category had the highest average mathematics achievement. This pattern suggests that, compared with their higher-achieving counterparts, the lower-performing students may be assigned more homework as a remedial strategy in an effort to keep up academically.

To provide a fuller picture of how students spend their out-of-school time on a school day, Exhibit 4.8 gives students' reports on how they spend their daily leisure time. The two most popular activities were watching television or videos and playing or talking with friends (each about two hours per day at eighth grade and a little less at fourth grade). Students reported spending more than one hour per day playing sports and working at jobs at home, and about one hour playing computer games and using the Internet.

How Confident Are Students in Their Ability to Learn Mathematics?

To investigate how students think of their abilities in mathematics, TIMSS created an index of students' self-confidence in learning mathematics. This index is based on students' responses to four statements about their mathematics ability:

- I usually do well in mathematics;
- Mathematics is more difficult for me than for many of my classmates;*

* The response categories for this statement were reversed in constructing the index.

- Mathematics is not one of my strengths;*
- I learn things quickly in mathematics.

Students who agreed a little or agreed a lot with all four statements, on average, were assigned to the high level of the index, while students who disagreed a little or disagreed a lot with all four, on average, were assigned to the low level. The medium level includes all other possible combinations of responses. The percentages of students at each level of this index, and their average mathematics achievement, are presented in Exhibit 4.9 for both eighth and fourth grades.

On average, internationally, 40 percent of the eighth-grade students had high self-confidence in learning mathematics. The percentages ranged from a high of 59 percent in Israel to a low of 17 percent in Japan. Although there was a clear positive association between self-confidence in learning mathematics and mathematics achievement, internationally and in every country, at the country level the relationship was more complex. It is noteworthy that the four countries with lowest percentages of students in the high self-confidence category – Chinese Taipei, Hong Kong SAR, Japan, and Korea – all had high average mathematics achievement. Since all of these are Asian Pacific countries, they may share cultural traditions that encourage modest self-confidence.

At fourth grade, on average, internationally, 55 percent of students were at the high level of the self-confidence in learning mathematics index, compared with 33 percent at the medium and just 11 percent at the low. The countries with the greatest percentages included Slovenia, and Cyprus, each with 70 percent or more. Countries with relatively lower percentages included Japan and the Philippines, each with less than 40 percent at the high level. Again, there was a positive relationship, on average, between self-confidence in learning mathematics and mathematics achievement.

* The response categories for this statement were reversed in constructing the index.

Exhibit 4.9: Index of Students' Self-Confidence in Learning Mathematics (SCM)

Index of Students' Self-Confidence in Learning Mathematics	Countries	High SCM		Medium SCM		Low SCM	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Index based on students' responses to four statements about mathematics: 1) I usually do well in mathematics; 2) Mathematics is more difficult for me than for many of my classmates (Reversed); 3) Mathematics is not one of my strengths (Reversed); 4) I learn things quickly in mathematics.	Israel	59 (1.2)	526 (3.5)	30 (0.9)	461 (3.8)	11 (0.7)	451 (5.7)
	Egypt	58 (1.0)	437 (3.3)	35 (0.9)	383 (3.7)	7 (0.4)	374 (5.3)
	Scotland	52 (1.5)	524 (3.9)	32 (1.0)	477 (3.8)	15 (0.9)	456 (5.0)
	United States	51 (0.8)	534 (3.3)	29 (0.6)	483 (3.5)	20 (0.6)	461 (3.6)
	Australia	50 (1.7)	542 (4.5)	31 (1.1)	483 (3.7)	19 (1.2)	451 (6.4)
	Jordan	49 (1.2)	463 (4.7)	38 (1.0)	400 (3.7)	13 (0.7)	390 (4.4)
	Sweden	49 (1.3)	534 (2.6)	36 (0.9)	477 (3.1)	16 (0.9)	446 (3.4)
	Norway	46 (1.1)	502 (2.0)	32 (0.8)	445 (2.9)	21 (0.8)	405 (3.4)
	Cyprus	46 (0.8)	503 (2.0)	32 (0.8)	437 (2.2)	22 (0.7)	407 (3.6)
	Italy	46 (0.9)	521 (3.3)	29 (0.9)	466 (3.6)	25 (1.0)	439 (3.4)
	Belgium (Flemish)	45 (0.9)	556 (3.2)	30 (0.7)	526 (3.0)	25 (0.8)	518 (3.5)
	Netherlands	45 (1.4)	557 (4.4)	33 (1.0)	527 (4.7)	23 (1.0)	511 (4.8)
	Serbia	44 (1.1)	530 (2.8)	26 (0.7)	458 (3.2)	30 (1.1)	422 (3.4)
	Bahrain	44 (0.9)	437 (2.0)	38 (0.9)	379 (2.4)	18 (0.6)	366 (3.2)
	Tunisia	44 (1.0)	436 (2.7)	36 (0.8)	399 (2.5)	20 (0.9)	384 (2.2)
	Hungary	44 (1.0)	574 (3.3)	32 (1.0)	507 (3.9)	24 (0.8)	479 (3.9)
	Ghana	43 (1.4)	306 (5.6)	44 (1.2)	265 (4.8)	12 (0.7)	265 (7.5)
	Palestinian Nat'l Auth.	43 (1.0)	428 (3.9)	41 (0.9)	370 (2.9)	16 (0.6)	355 (3.6)
	Russian Federation	43 (1.1)	548 (3.0)	30 (0.8)	492 (4.1)	27 (0.8)	466 (4.6)
	New Zealand	43 (1.4)	534 (6.4)	36 (1.1)	475 (5.4)	21 (0.9)	452 (4.1)
	Lebanon	43 (1.4)	462 (3.6)	44 (1.1)	416 (3.1)	13 (0.7)	403 (4.4)
	Saudi Arabia	41 (1.4)	361 (4.8)	43 (1.1)	321 (5.4)	16 (0.9)	303 (5.8)
	Armenia	41 (1.1)	505 (4.0)	40 (1.0)	468 (3.7)	19 (0.9)	462 (4.1)
	Estonia	41 (0.9)	569 (3.2)	32 (0.7)	520 (3.1)	28 (0.8)	489 (3.5)
	Slovak Republic	40 (1.1)	556 (3.7)	35 (1.0)	487 (3.9)	25 (1.0)	462 (4.1)
	Slovenia	40 (0.9)	533 (3.2)	39 (1.0)	474 (2.5)	20 (0.9)	453 (2.8)
	Morocco	40 (1.3)	413 (4.1)	41 (1.4)	377 (2.6)	19 (1.2)	368 (4.5)
	Singapore	39 (0.8)	639 (3.0)	34 (0.7)	594 (3.9)	27 (0.7)	571 (4.6)
	Malaysia	39 (1.2)	546 (4.2)	45 (1.0)	490 (3.7)	16 (0.7)	471 (4.4)
	Botswana	38 (0.9)	390 (2.8)	45 (0.8)	361 (2.5)	17 (0.8)	352 (3.4)
	South Africa	37 (0.9)	300 (8.3)	48 (0.9)	242 (3.9)	15 (0.8)	255 (9.9)
	Lithuania	36 (1.0)	552 (3.1)	37 (0.9)	486 (2.8)	26 (0.9)	456 (2.7)
	Iran, Islamic Rep. of	35 (0.9)	447 (3.5)	49 (0.8)	399 (2.6)	16 (0.7)	377 (3.4)
Chile	35 (0.9)	427 (3.9)	42 (0.7)	369 (3.4)	23 (0.7)	361 (3.9)	
Latvia	34 (1.0)	555 (3.4)	33 (0.9)	499 (3.2)	33 (1.0)	473 (3.4)	
Bulgaria	33 (1.3)	519 (5.5)	39 (1.4)	467 (4.2)	28 (1.2)	445 (4.8)	
Macedonia, Rep. of	33 (1.0)	482 (4.0)	37 (1.0)	418 (4.7)	31 (1.0)	424 (3.9)	
Korea, Rep. of	30 (0.7)	650 (2.8)	36 (0.6)	592 (2.5)	34 (0.8)	534 (2.3)	
Moldova, Rep. of	30 (1.2)	494 (5.0)	50 (0.9)	451 (4.5)	20 (1.1)	441 (5.3)	
Romania	30 (1.2)	533 (4.6)	45 (1.1)	465 (4.5)	25 (0.9)	442 (5.4)	
Hong Kong, SAR	30 (0.9)	627 (2.9)	38 (0.7)	581 (4.1)	33 (0.9)	556 (4.0)	
Philippines	29 (0.7)	405 (6.1)	59 (0.7)	369 (4.8)	12 (0.5)	366 (6.5)	
Indonesia	27 (1.1)	420 (6.6)	59 (0.8)	408 (4.5)	15 (0.9)	416 (4.7)	
Chinese Taipei	26 (1.0)	661 (4.1)	30 (0.7)	593 (5.1)	44 (1.1)	534 (4.0)	
Japan	17 (0.6)	634 (3.1)	38 (0.7)	580 (2.7)	45 (0.8)	538 (2.3)	
‡ England	47 (1.5)	526 (5.8)	34 (1.2)	485 (4.7)	19 (1.1)	468 (5.5)	
International Avg.	40 (0.2)	504 (0.6)	38 (0.1)	453 (0.6)	22 (0.1)	433 (0.7)	
Benchmarking Participants							
Basque Country, Spain	46 (1.6)	518 (3.1)	29 (1.1)	471 (3.1)	24 (1.4)	449 (2.9)	
Indiana State, US	50 (1.7)	536 (6.0)	28 (1.0)	493 (4.8)	22 (1.2)	470 (4.4)	
Ontario Province, Can.	63 (1.2)	549 (3.0)	22 (0.9)	484 (3.2)	15 (0.8)	460 (3.6)	
Quebec Province, Can.	59 (1.3)	566 (3.3)	24 (0.9)	521 (2.9)	16 (0.8)	498 (3.2)	

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

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

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit 4.9: Index of Students' Self-Confidence in Learning Mathematics (SCM)



Countries	High SCM		Medium SCM		Low SCM	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Slovenia	77 (1.0)	499 (2.6)	18 (0.8)	424 (4.2)	5 (0.5)	409 (5.8)
Cyprus	71 (1.0)	531 (2.6)	24 (0.9)	466 (3.5)	5 (0.4)	443 (6.5)
Netherlands	67 (1.0)	556 (2.3)	22 (0.9)	516 (2.8)	11 (0.6)	498 (4.4)
Norway	65 (0.9)	472 (2.4)	28 (0.8)	426 (3.0)	8 (0.6)	399 (5.7)
United States	64 (0.7)	541 (2.3)	25 (0.5)	486 (2.8)	11 (0.4)	475 (2.7)
Hungary	64 (0.8)	556 (3.1)	26 (0.8)	487 (3.8)	9 (0.5)	473 (5.2)
Australia	64 (0.9)	522 (3.7)	25 (0.9)	471 (5.2)	11 (0.8)	436 (8.1)
Scotland	64 (0.8)	508 (3.5)	26 (0.9)	468 (3.7)	11 (0.6)	451 (5.8)
Belgium (Flemish)	62 (0.8)	569 (1.8)	26 (0.7)	526 (2.7)	13 (0.6)	510 (3.1)
Italy	62 (1.0)	523 (3.9)	29 (0.8)	479 (5.0)	9 (0.5)	458 (6.1)
Lithuania	61 (1.2)	559 (3.0)	31 (1.0)	505 (3.9)	8 (0.6)	489 (8.0)
England	59 (1.1)	556 (4.1)	30 (0.9)	505 (4.3)	11 (0.6)	480 (5.3)
Tunisia ^r	56 (1.8)	367 (4.9)	37 (1.6)	321 (5.5)	7 (0.7)	305 (9.4)
New Zealand	54 (1.1)	526 (2.5)	36 (1.0)	464 (2.9)	9 (0.5)	446 (4.3)
Morocco ^r	54 (1.8)	372 (5.0)	40 (1.5)	342 (6.4)	6 (0.6)	324 (10.6)
Russian Federation	53 (1.4)	558 (4.8)	32 (1.1)	513 (5.1)	15 (0.7)	500 (5.5)
Moldova, Rep. of	52 (1.5)	535 (5.9)	40 (1.4)	478 (4.5)	8 (0.7)	461 (8.6)
Latvia	50 (1.1)	566 (3.2)	34 (0.9)	513 (3.6)	16 (0.8)	492 (4.1)
Singapore	49 (1.6)	629 (5.0)	35 (1.1)	573 (5.3)	16 (0.9)	540 (6.2)
Armenia ^s	43 (1.1)	495 (4.5)	44 (1.1)	453 (4.6)	13 (0.8)	446 (5.7)
Iran, Islamic Rep. of	42 (1.6)	418 (4.8)	51 (1.6)	374 (4.3)	7 (0.5)	349 (8.9)
Chinese Taipei	41 (0.9)	591 (2.2)	39 (0.9)	549 (2.2)	20 (0.6)	539 (2.1)
Hong Kong, SAR	40 (1.1)	601 (3.1)	42 (0.9)	562 (3.6)	19 (0.8)	548 (3.7)
Japan	39 (0.9)	600 (2.2)	40 (0.9)	550 (2.3)	21 (0.8)	532 (2.2)
Philippines	34 (1.2)	395 (11.7)	53 (1.2)	351 (6.8)	12 (0.7)	326 (7.4)
International Avg.	55 (0.2)	522 (0.9)	33 (0.2)	472 (0.9)	11 (0.1)	453 (1.2)
Benchmarking Participants						
Indiana State, US	64 (1.5)	551 (3.1)	22 (0.9)	511 (3.5)	14 (1.0)	493 (6.2)
Ontario Province, Can.	67 (1.4)	531 (4.2)	23 (1.2)	480 (3.4)	10 (0.7)	463 (5.3)
Quebec Province, Can.	70 (1.1)	525 (2.2)	22 (0.9)	471 (3.2)	8 (0.5)	448 (5.0)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Background data provided by students.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students.

What Value Do Students Place on Mathematics?

Students' motivation to learn mathematics can be affected by whether they find the subject enjoyable, place value on the subject, and think it is important for success in school and for future career aspirations. In addition, developing such positive attitudes towards mathematics among students is an important goal of mathematics education in many countries. To gain some understanding about the value eighth- and fourth-grade students place on mathematics, TIMSS created an index of students valuing mathematics. Students were asked to state their agreement with the following seven statements about mathematics:

- I would like to take more mathematics in school;
- I enjoy learning mathematics;
- I think learning mathematics will help me in my daily life;
- I need mathematics to learn other school subjects;
- I need to do well in mathematics to get into the university of my choice;
- I would like a job that involved using mathematics;
- I need to do well in mathematics to get the job I want.

Students who agreed a little or agreed a lot on average with all seven statements were assigned to the high level of the index, while students who on average disagreed a little or disagreed a lot with all seven were assigned to the low level. Students between these extremes were placed in the medium category. The percentages of students at each level of this index, and their average mathematics achievement, are presented in Exhibit 4.10 for both eighth and fourth grades.

Across the participating countries, on average, students generally placed a high value on mathematics, with 55 percent in the high category, and a further 35 percent in the medium category. Only 10 percent of students were in the low category. Countries with large percentages of

students at the high level included Morocco, Botswana, Ghana, Egypt, and Jordan, with 80 percent or more in this category. Among countries where students reported placing less value on mathematics were Korea, Japan, and the Netherlands with less than 20 percent. Since these are countries with high average mathematics achievement, it may be that the students follow a demanding mathematics curriculum, one that leads to high achievement but little enthusiasm for the subject matter. Despite some high percentages for low performing countries and low percentages for high performing countries, students in the high category had higher average mathematics achievement than those in the medium and low categories.

To provide more information on changes from 1995 and 1999 in an important component of the *students valuing mathematics* index, Exhibit 4.11 displays the percentages of eighth-grade students in 2003, 1999, and 1995 that “agree a lot,” “agree a little,” or “disagree” that they enjoy learning mathematics. Comparable data at fourth grade are shown for 2003 and 1995 only.

At the eighth grade, on average, internationally, there was a significant increase from 1995 and 1999 in the average percentage of students agreeing a lot that they enjoy learning mathematics, from 17 percent in 1995 to 25 percent in 1999 to 29 percent in 2003. Nevertheless, the upward trend from 1995 to 1999 in the percentage of students agreeing a lot that they enjoy learning mathematics appears to have leveled somewhat off in 2003. Participants showing a significant increase in 2003 over either 1995 or 1999 included Australia, Belgium (Flemish), Chile, Hungary, Iran, Japan, Jordan, Korea, Lithuania, Macedonia, Moldova, New Zealand, the Russian Federation, Singapore, the Slovak Republic, Tunisia, the United States, Ontario, and Quebec. At fourth grade, the average percentage of students agreeing a lot that they enjoy learning mathematics increased from 46 percent in 1995 to 50 percent in 2003. Countries showing a significant increase included Australia, Hungary, Iran, Japan, New Zealand, Norway, Singapore, and the United States.

Exhibit 4.10: Index of Students' Valuing Mathematics (SVM)

Index of Students' Valuing Mathematics	Countries	High SVM		Medium SVM		Low SVM	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
	Morocco	85 (1.0)	391 (2.6)	12 (0.8)	377 (5.2)	3 (0.4)	380 (9.8)
	Botswana	84 (0.7)	378 (2.7)	14 (0.7)	331 (2.8)	2 (0.2)	~ ~
	Ghana	82 (1.2)	293 (4.8)	16 (1.1)	227 (4.8)	1 (0.2)	~ ~
	Egypt	82 (0.7)	418 (3.3)	16 (0.7)	386 (4.7)	2 (0.3)	~ ~
	Jordan	81 (0.9)	436 (3.8)	16 (0.8)	398 (8.0)	3 (0.3)	395 (8.1)
	Tunisia	79 (0.9)	417 (2.2)	17 (0.7)	395 (3.2)	4 (0.4)	385 (3.8)
	South Africa	79 (0.9)	271 (5.6)	17 (0.8)	243 (9.1)	4 (0.3)	241 (11.4)
	Malaysia	78 (1.0)	515 (4.1)	21 (0.9)	486 (5.0)	1 (0.1)	~ ~
	Palestinian Nat'l Auth.	77 (1.0)	403 (3.1)	19 (0.9)	355 (4.2)	4 (0.4)	344 (8.5)
	Philippines	73 (1.1)	390 (5.1)	25 (1.0)	347 (6.1)	2 (0.2)	~ ~
	Indonesia	71 (1.1)	411 (5.1)	28 (1.1)	415 (4.4)	1 (0.1)	~ ~
	Lebanon	71 (1.2)	442 (3.2)	24 (1.1)	413 (5.0)	4 (0.4)	409 (7.4)
	Iran, Islamic Rep. of	70 (0.9)	415 (2.6)	24 (0.8)	407 (3.1)	6 (0.4)	393 (6.1)
	Bahrain	70 (0.9)	407 (2.2)	25 (0.7)	393 (2.5)	6 (0.5)	381 (6.0)
	Chile	66 (1.0)	388 (3.6)	29 (0.9)	385 (3.7)	5 (0.3)	389 (6.0)
	Singapore	63 (0.8)	616 (3.4)	32 (0.6)	592 (4.0)	5 (0.3)	558 (7.9)
	Saudi Arabia	63 (1.5)	339 (5.2)	26 (1.0)	330 (4.4)	11 (0.8)	323 (5.7)
	Moldova, Rep. of	61 (1.4)	468 (4.4)	35 (1.2)	452 (4.7)	4 (0.5)	441 (11.5)
	Armenia	59 (1.1)	488 (3.7)	30 (0.9)	473 (3.4)	11 (0.7)	469 (5.4)
	United States	58 (0.8)	512 (3.6)	34 (0.7)	498 (3.4)	8 (0.4)	485 (4.6)
	Israel	56 (1.3)	499 (4.1)	35 (1.1)	500 (4.2)	9 (0.6)	487 (5.5)
	New Zealand	56 (1.3)	499 (5.3)	36 (1.2)	493 (6.0)	8 (0.7)	480 (6.9)
	Russian Federation	55 (1.1)	522 (4.3)	39 (1.0)	496 (3.3)	7 (0.5)	482 (4.6)
	Macedonia, Rep. of	55 (1.0)	437 (4.1)	31 (0.8)	443 (4.4)	14 (0.8)	443 (4.9)
	Scotland	54 (1.3)	503 (4.1)	37 (1.0)	497 (3.9)	9 (0.7)	479 (6.6)
	Cyprus	53 (0.8)	476 (2.2)	36 (0.9)	443 (2.6)	11 (0.5)	439 (4.4)
	Lithuania	53 (1.0)	515 (2.7)	40 (1.0)	489 (3.2)	7 (0.4)	473 (4.4)
	Romania	53 (1.3)	493 (5.0)	35 (1.1)	469 (4.5)	12 (0.8)	451 (8.4)
	Australia	51 (1.3)	517 (4.9)	37 (1.0)	499 (4.9)	12 (0.6)	481 (7.4)
	Latvia	50 (1.2)	519 (3.9)	43 (1.0)	502 (3.3)	8 (0.6)	484 (6.6)
	Bulgaria	48 (1.5)	488 (4.7)	39 (1.1)	472 (5.0)	14 (1.1)	461 (5.9)
	Slovak Republic	47 (1.3)	519 (3.9)	44 (1.2)	500 (3.8)	9 (0.5)	498 (4.7)
	Hungary	47 (1.0)	540 (3.8)	44 (0.9)	519 (3.7)	9 (0.6)	527 (5.3)
	Norway	45 (1.2)	475 (3.0)	42 (1.0)	458 (2.2)	13 (0.8)	432 (4.4)
	Serbia	43 (1.2)	488 (3.5)	39 (1.0)	473 (3.1)	18 (0.9)	471 (4.3)
	Estonia	38 (1.2)	540 (3.6)	49 (1.1)	531 (3.5)	13 (0.7)	508 (4.0)
	Hong Kong, SAR	35 (1.0)	607 (3.4)	55 (0.8)	581 (3.4)	10 (0.5)	544 (6.1)
	Italy	32 (1.0)	505 (3.9)	52 (0.9)	480 (3.4)	16 (0.8)	454 (3.7)
	Belgium (Flemish)	29 (1.0)	557 (3.7)	47 (0.8)	535 (2.7)	24 (0.9)	521 (3.7)
	Sweden	29 (1.1)	514 (3.8)	60 (1.1)	496 (2.8)	11 (0.7)	479 (3.5)
	Chinese Taipei	25 (1.0)	630 (5.3)	50 (0.8)	587 (4.7)	24 (1.0)	536 (5.0)
	Slovenia	25 (1.1)	510 (3.7)	58 (1.0)	491 (2.6)	17 (1.0)	478 (3.5)
	Korea, Rep. of	18 (0.7)	633 (3.4)	59 (0.7)	593 (2.5)	23 (0.8)	546 (2.9)
	Japan	17 (0.6)	597 (3.1)	61 (0.8)	574 (2.2)	22 (0.8)	539 (3.3)
	Netherlands	16 (1.0)	526 (7.9)	59 (1.3)	540 (4.1)	25 (1.2)	534 (4.3)
	‡ England	39 (1.5)	508 (6.2)	46 (1.3)	500 (4.8)	15 (0.8)	486 (6.7)
	International Avg.	55 (0.2)	479 (0.6)	35 (0.1)	458 (0.6)	10 (0.1)	458 (1.0)
	Benchmarking Participants						
	Basque Country, Spain	42 (1.7)	500 (3.3)	39 (1.2)	484 (3.3)	19 (1.0)	467 (3.5)
	Indiana State, US	57 (1.6)	518 (6.3)	34 (1.3)	500 (4.3)	9 (0.9)	487 (5.7)
	Ontario Province, Can.	69 (1.4)	532 (3.3)	25 (1.0)	501 (3.7)	6 (0.7)	481 (5.1)
	Quebec Province, Can.	55 (1.1)	551 (3.6)	39 (0.9)	536 (2.9)	6 (0.4)	519 (5.1)

Background data provided by students.

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

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit 4.11: Trends in "I Enjoy Learning Mathematics"

Countries	Agree A Lot			Agree A Little			Disagree		
	2003 Percent of Students	1999 Percent of Students	1995 Percent of Students	2003 Percent of Students	1999 Percent of Students	1995 Percent of Students	2003 Percent of Students	1999 Percent of Students	1995 Percent of Students
Armenia	45 (1.2)	◇ ◇	◇ ◇	28 (0.8)	◇ ◇	◇ ◇	28 (1.1)	◇ ◇	◇ ◇
Australia	18 (1.2)	--	13 (0.7) ▲	39 (1.0)	--	52 (0.6) ▼	42 (1.4)	--	35 (0.9) ▲
Bahrain	40 (0.9)	◇ ◇	◇ ◇	33 (0.9)	◇ ◇	◇ ◇	26 (1.0)	◇ ◇	◇ ◇
Belgium (Flemish)	20 (0.9)	14 (0.6) ▲	14 (1.0) ▲	37 (0.9)	37 (0.8)	41 (1.2) ▼	43 (1.3)	49 (1.0) ▼	45 (1.3)
Botswana	65 (1.0)	◇ ◇	◇ ◇	22 (0.8)	◇ ◇	◇ ◇	14 (0.7)	◇ ◇	◇ ◇
Bulgaria	22 (1.1)	21 (1.4)	--	39 (1.1)	35 (1.2) ▲	--	38 (1.5)	44 (2.1) ▼	--
Chile	34 (1.1)	30 (1.1) ▲	◇ ◇	37 (0.7)	45 (0.7) ▼	◇ ◇	30 (1.2)	26 (1.0) ▲	◇ ◇
Chinese Taipei	13 (0.6)	16 (0.7) ▼	◇ ◇	29 (1.0)	42 (0.7) ▼	◇ ◇	58 (1.4)	42 (1.0) ▲	◇ ◇
Cyprus	36 (0.8)	38 (1.2)	38 (1.1)	34 (0.9)	46 (1.0) ▼	45 (0.8) ▼	30 (0.7)	17 (1.0) ▲	17 (0.9) ▲
Egypt	61 (1.0)	◇ ◇	◇ ◇	27 (0.8)	◇ ◇	◇ ◇	12 (0.6)	◇ ◇	◇ ◇
Estonia	14 (0.7)	◇ ◇	◇ ◇	39 (0.8)	◇ ◇	◇ ◇	48 (1.0)	◇ ◇	◇ ◇
Ghana	53 (1.2)	◇ ◇	◇ ◇	30 (0.8)	◇ ◇	◇ ◇	16 (0.9)	◇ ◇	◇ ◇
Hong Kong, SAR	15 (0.7)	19 (0.7) ▼	15 (0.8)	45 (1.0)	50 (0.8) ▼	50 (1.1) ▼	41 (1.1)	31 (1.1) ▲	35 (1.3) ▲
Hungary	17 (0.9)	8 (0.5) ▲	8 (0.7) ▲	36 (0.9)	30 (1.1) ▲	31 (1.2) ▲	47 (1.2)	62 (1.2) ▼	61 (1.3) ▼
Indonesia	21 (0.9)	25 (1.4) ▼	◇ ◇	62 (0.9)	67 (1.2) ▼	◇ ◇	17 (0.9)	7 (0.6) ▲	◇ ◇
Iran, Islamic Rep. of	58 (1.0)	50 (0.9) ▲	39 (1.2) ▲	26 (0.8)	40 (0.9) ▼	43 (1.2) ▼	16 (0.7)	11 (0.6) ▲	18 (1.1)
Israel	27 (1.1)	31 (1.4) ▼	--	34 (0.8)	42 (0.9) ▼	--	39 (1.1)	28 (1.4) ▲	--
Italy	16 (0.8)	21 (0.9) ▼	--	43 (1.2)	45 (1.1)	--	41 (1.2)	34 (1.3) ▲	--
Japan	9 (0.6)	6 (0.4) ▲	5 (0.3) ▲	30 (0.8)	33 (1.0) ▼	41 (1.3) ▼	61 (1.1)	61 (1.1)	54 (1.5) ▲
Jordan	50 (1.3)	46 (1.2) ▲	◇ ◇	31 (1.0)	37 (0.8) ▼	◇ ◇	19 (1.0)	18 (0.9)	◇ ◇
Korea, Rep. of	9 (0.5)	5 (0.3) ▲	8 (0.6)	34 (0.8)	27 (0.7) ▲	33 (1.0)	57 (1.0)	68 (0.7) ▼	59 (1.1)
Latvia	14 (0.9)	--	--	33 (0.9)	--	--	53 (1.3)	--	--
Lebanon	50 (1.4)	◇ ◇	◇ ◇	28 (1.0)	◇ ◇	◇ ◇	23 (1.0)	◇ ◇	◇ ◇
Lithuania	18 (0.9)	13 (0.9) ▲	12 (0.9) ▲	36 (0.9)	46 (1.3) ▼	33 (1.3)	46 (1.2)	40 (1.5) ▲	55 (1.3) ▼
Macedonia, Rep. of	36 (1.1)	29 (0.9) ▲	◇ ◇	31 (0.9)	39 (0.9) ▼	◇ ◇	33 (1.0)	33 (1.1)	◇ ◇
Malaysia	41 (1.1)	43 (1.0)	◇ ◇	45 (0.9)	50 (0.9) ▼	◇ ◇	14 (0.7)	6 (0.4) ▲	◇ ◇
Moldova, Rep. of	23 (1.0)	18 (1.0) ▲	◇ ◇	51 (1.1)	49 (1.2)	◇ ◇	26 (1.2)	33 (1.4) ▼	◇ ◇
Morocco	60 (1.5)	--	◇ ◇	23 (1.0)	--	◇ ◇	17 (0.9)	--	◇ ◇
Netherlands	6 (0.5)	14 (1.1) ▼	10 (1.1) ▼	26 (1.2)	44 (1.4) ▼	46 (1.9) ▼	69 (1.4)	43 (1.8) ▲	44 (2.4) ▲
New Zealand	23 (1.2)	20 (1.0) ▲	20 (1.0) ▲	38 (1.1)	53 (0.9) ▼	54 (0.9) ▼	39 (1.3)	27 (1.1) ▲	26 (1.0) ▲
Norway	22 (1.0)	◇ ◇	20 (0.9)	40 (0.9)	◇ ◇	55 (1.0) ▼	38 (1.3)	◇ ◇	24 (1.1) ▲
Palestinian Nat'l Auth.	45 (1.2)	◇ ◇	◇ ◇	33 (0.9)	◇ ◇	◇ ◇	22 (1.0)	◇ ◇	◇ ◇
Philippines	38 (0.9)	45 (1.0) ▼	◇ ◇	44 (0.7)	46 (1.0)	◇ ◇	18 (0.8)	9 (0.6) ▲	◇ ◇
Romania	21 (1.0)	19 (0.9)	25 (1.1) ▼	39 (1.0)	49 (1.1) ▼	48 (1.1) ▼	39 (1.2)	32 (1.4) ▲	27 (1.2) ▲
Russian Federation	17 (0.7)	16 (0.8)	14 (0.8) ▲	38 (1.0)	41 (1.2) ▼	40 (1.3)	45 (1.2)	43 (1.5)	46 (1.4)
Saudi Arabia	34 (1.5)	◇ ◇	◇ ◇	34 (1.0)	◇ ◇	◇ ◇	32 (1.4)	◇ ◇	◇ ◇
Scotland	18 (0.8)	◇ ◇	--	40 (1.2)	◇ ◇	--	42 (1.5)	◇ ◇	--
Serbia	23 (1.1)	◇ ◇	◇ ◇	29 (0.8)	◇ ◇	◇ ◇	49 (1.2)	◇ ◇	◇ ◇
Singapore	33 (0.7)	28 (0.9) ▲	25 (1.0) ▲	42 (0.7)	52 (0.9) ▼	53 (0.8) ▼	25 (0.8)	20 (1.0) ▲	22 (1.0) ▲
Slovak Republic	13 (0.9)	11 (0.8)	10 (0.6) ▲	40 (1.2)	48 (1.2) ▼	48 (1.2) ▼	47 (1.4)	41 (1.5) ▲	42 (1.3) ▲
Slovenia	7 (0.6)	--	10 (0.7) ▼	28 (1.1)	--	39 (1.4) ▼	65 (1.2)	--	51 (1.6) ▲
South Africa	56 (1.2)	54 (1.1)	--	24 (0.8)	34 (1.0) ▼	--	20 (1.0)	12 (0.6) ▲	--
Sweden	15 (0.9)	◇ ◇	17 (1.1)	51 (1.1)	◇ ◇	57 (1.2) ▼	34 (1.3)	◇ ◇	26 (1.2) ▲
Tunisia	45 (1.1)	38 (1.0) ▲	◇ ◇	31 (0.8)	44 (0.8) ▼	◇ ◇	24 (1.0)	18 (0.8) ▲	◇ ◇
United States	22 (0.6)	22 (0.9)	20 (0.7) ▲	38 (0.7)	47 (0.6) ▼	50 (0.9) ▼	40 (0.8)	31 (1.1) ▲	30 (0.9) ▲
‡ England	14 (1.1)	25 (1.1) ▼	22 (1.1) ▼	39 (1.2)	54 (1.2) ▼	59 (1.5) ▼	47 (1.5)	21 (1.0) ▲	20 (1.3) ▲
International Avg.	29 (0.1)	25 (0.2) ▲	17 (0.2) ▲	36 (0.1)	44 (0.2) ▼	46 (0.3) ▼	35 (0.2)	31 (0.2) ▲	37 (0.3) ▼
Benchmarking Participants									
Basque Country, Spain	18 (1.3)	◇ ◇	◇ ◇	31 (1.4)	◇ ◇	◇ ◇	51 (1.8)	◇ ◇	◇ ◇
Indiana State, US	22 (1.0)	19 (1.4)	◇ ◇	37 (1.2)	50 (1.1) ▼	◇ ◇	41 (1.5)	30 (1.8) ▲	◇ ◇
Ontario Province, Can.	30 (1.1)	27 (1.4) ▲	24 (1.2) ▲	40 (1.1)	47 (1.1) ▼	54 (1.5) ▼	30 (1.3)	26 (1.2) ▲	22 (1.6) ▲
Quebec Province, Can.	19 (0.8)	10 (2.3) ▲	20 (2.3)	52 (0.9)	37 (4.2) ▲	51 (1.8)	28 (1.1)	53 (2.3) ▼	28 (2.1)

▲ 2003 significantly higher
▼ 2003 significantly lower

Background data provided by students.

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

Trend notes: Because of differences in population coverage, 1999 data are not shown for Australia, Latvia, Morocco, and Slovenia, and 1995 data are not shown for Israel, Italy, Latvia, and South Africa. Korea tested later in 2003 than in 1999 and 1995, at the beginning of the next school year. Similarly, Lithuania tested later in 1999 than in 2003 and 1995.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (–) indicates comparable data are not available.

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

A diamond (◇) indicates the country did not participate in the assessment.

Exhibit 4.11: Trends in "I Enjoy Learning Mathematics"

Countries	Agree A Lot		Agree A Little		Disagree	
	2003 Percent of Students	1995 Percent of Students	2003 Percent of Students	1995 Percent of Students	2003 Percent of Students	1995 Percent of Students
Armenia	71 (1.1)	◇ ◇	8 (0.7)	◇ ◇	20 (0.9)	◇ ◇
Australia	52 (1.4)	41 (1.1) ▲	27 (1.2)	42 (0.9) ▼	20 (0.9)	17 (0.7) ▲
Belgium (Flemish)	27 (0.8)	◇ ◇	38 (0.7)	◇ ◇	35 (1.2)	◇ ◇
Chinese Taipei	31 (0.9)	◇ ◇	35 (0.8)	◇ ◇	34 (1.0)	◇ ◇
Cyprus	57 (1.2)	73 (1.2) ▼	24 (0.7)	22 (1.1)	19 (0.9)	5 (0.5) ▲
England	43 (1.2)	53 (1.4) ▼	27 (0.8)	31 (1.0) ▼	30 (1.3)	16 (1.0) ▲
Hong Kong, SAR	30 (1.2)	34 (1.6) ▼	42 (0.8)	49 (1.2) ▼	28 (1.0)	17 (1.0) ▲
Hungary	49 (1.3)	32 (1.3) ▲	27 (0.9)	45 (1.2) ▼	24 (1.2)	23 (1.5)
Iran, Islamic Rep. of	81 (1.4)	72 (1.7) ▲	11 (1.1)	22 (1.3) ▼	7 (0.8)	5 (0.7)
Italy	40 (1.2)	--	41 (0.9)	--	19 (1.0)	--
Japan	29 (1.0)	16 (0.8) ▲	36 (0.8)	56 (1.0) ▼	35 (1.2)	28 (1.1) ▲
Latvia	49 (1.1)	--	30 (0.8)	--	21 (0.9)	--
Lithuania	58 (1.0)	◇ ◇	25 (0.8)	◇ ◇	17 (0.8)	◇ ◇
Moldova, Rep. of	49 (1.3)	◇ ◇	38 (1.1)	◇ ◇	12 (0.8)	◇ ◇
Morocco	71 (1.5)	◇ ◇	18 (1.2)	◇ ◇	11 (0.7)	◇ ◇
Netherlands	30 (1.3)	28 (1.2)	39 (1.0)	40 (1.3)	31 (1.4)	32 (1.5)
New Zealand	52 (1.1)	45 (1.4) ▲	29 (1.0)	37 (1.2) ▼	19 (0.7)	18 (1.0)
Norway	52 (1.5)	52 (1.9)	28 (0.9)	34 (1.4) ▼	20 (1.1)	14 (1.2) ▲
Philippines	50 (1.6)	◇ ◇	30 (1.2)	◇ ◇	20 (1.2)	◇ ◇
Russian Federation	50 (1.3)	◇ ◇	29 (1.1)	◇ ◇	21 (1.0)	◇ ◇
Scotland	50 (1.3)	--	26 (1.0)	--	24 (1.1)	--
Singapore	57 (0.8)	48 (1.0) ▲	27 (0.5)	44 (0.8) ▼	15 (0.6)	8 (0.6) ▲
Slovenia	49 (1.5)	59 (1.7) ▼	26 (1.1)	31 (1.4) ▼	24 (1.4)	10 (0.9) ▲
Tunisia	70 (1.5)	◇ ◇	18 (1.0)	◇ ◇	12 (0.9)	◇ ◇
United States	54 (0.9)	47 (1.6) ▲	25 (0.5)	38 (1.0) ▼	20 (0.6)	15 (0.9) ▲
International Avg.	50 (0.2)	46 (0.4) ▲	28 (0.2)	38 (0.3) ▼	22 (0.2)	16 (0.3) ▲
Benchmarking Participants						
Indiana State, US	53 (1.7)	◇ ◇	26 (1.0)	◇ ◇	21 (1.4)	◇ ◇
Ontario Province, Can.	48 (1.5)	48 (1.1)	31 (1.1)	41 (1.0) ▼	21 (1.2)	11 (0.8) ▲
Quebec Province, Can.	56 (1.2)	57 (2.7)	32 (1.0)	35 (2.8)	12 (0.8)	8 (1.4) ▲

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

▲ 2003 significantly higher
▼ 2003 significantly lower

Background data provided by students.

Trend notes: Because of differences between 1995 and 2003 in population coverage, 1995 data are not shown for Italy and Latvia. 1995 data for New Zealand in this exhibit include students in English medium instruction only (>98% of the estimated population).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (–) indicates comparable data are not available.

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

A diamond (◇) indicates the country did not participate in the assessment.

