


CHAPTER 1

Student Achievement in Science

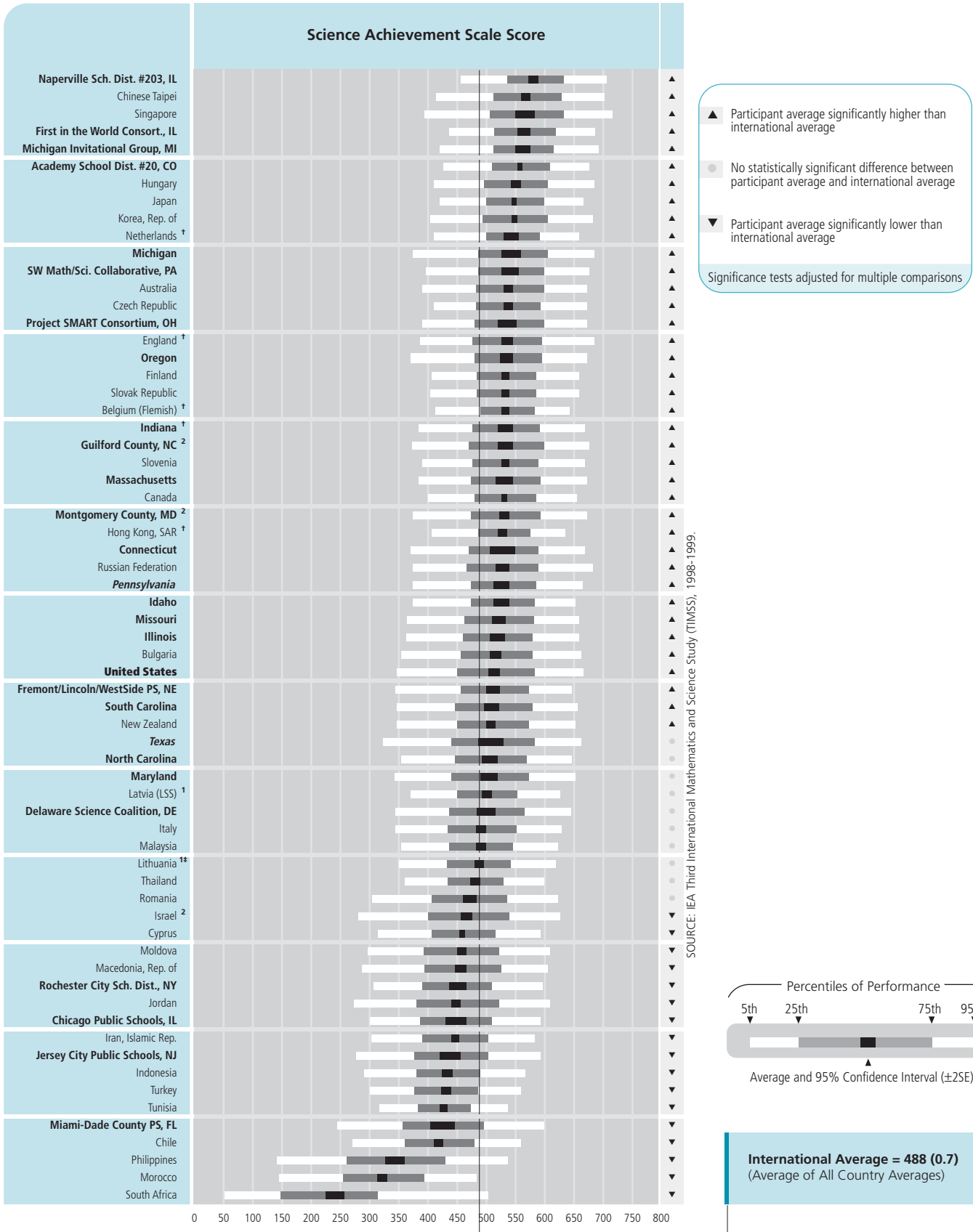
Chapter 1 summarizes eighth-grade achievement on the TIMSS 1999 science assessment for each of the Benchmarking states, districts, and consortia, as well as for each participating country. Comparisons of participants' performance against international benchmarks, as well as gender differences in performance, are also provided.



That achievement is distributed broadly within as well as across participating entities is graphically illustrated in Exhibit 1.1 showing the distribution of student performance within each entity. Achievement for each participant is shown for the 25th and 75th percentiles as well as for the 5th and 95th percentiles.³ Each percentile point indicates the percentages of students performing below and above that point on the scale. For example, 25 percent of the eighth-grade students in each participating entity performed below the 25th percentile for that entity, and 75 percent performed above the 25th percentile. The range between the 25th and 75th percentiles represents performance by the middle half of students. In most entities, the range of performance for the middle group was between 100 and 150 scale-score points. Performance at the 5th and 95th percentiles represents the extremes in both lower and higher achievement. The range of performance between these two score points, which includes 90 percent of the students, is shown in Exhibit 1.1.



The Naperville School District, Chinese Taipei, Singapore, the First in the World Consortium, the Michigan Invitational Group, and the Academy School District had the highest average performance, closely followed by Hungary, Japan, and Korea. Naperville, First in the World, the Michigan Invitational Group, and the Academy School District all had average achievement comparable to that of high-performing Chinese Taipei and Singapore. The difference in performance from one participant to the next was often negligible. Among Benchmarking jurisdictions, Michigan, the Southwest Pennsylvania Math and Science Collaborative, the Project SMART Consortium, Oregon, Indiana, Guilford County, Massachusetts, and Connecticut were outperformed by very few entities, and had higher average achievement than almost half of them. Montgomery County, Pennsylvania, Idaho, Missouri, and Illinois also had very similar performance, each scoring above slightly more than 20 other entities and being outscored by nine or fewer. Another group with roughly similar achievement includes the Fremont/Lincoln/Westside Public Schools, South Carolina, North Carolina, Maryland, and the Delaware Science Coalition. Each of these performed better than about 20 other entities and was outperformed by about 20 entities. Texas had similar achievement, but its large standard error reduced the number of statistically significant differences. The Rochester City School District, the Chicago Public Schools, the Jersey City Public Schools, and the Miami-Dade County Public Schools had average eighth-grade science performance lower than most of the TIMSS 1999 countries and comparable to that of Jordan, Iran, Indonesia, Turkey, and Tunisia.



	Average Scale Score	Years of Formal Schooling	Average Age
Countries			
United States	▲ 515 (4.6)	8	14.2
Australia	▲ 540 (4.4)	8 or 9	14.3
Belgium (Flemish) †	▲ 535 (3.1)	8	14.1
Bulgaria	▲ 518 (5.4)	8	14.8
Canada	▲ 533 (2.1)	8	14.0
Chile	▼ 420 (3.7)	8	14.4
Chinese Taipei	▲ 569 (4.4)	8	14.2
Cyprus	▼ 460 (2.4)	8	13.8
Czech Republic	▲ 539 (4.2)	8	14.4
England †	▲ 538 (4.8)	9	14.2
Finland	▲ 535 (3.5)	7	13.8
Hong Kong, SAR †	▲ 530 (3.7)	8	14.2
Hungary	▲ 552 (3.7)	8	14.4
Indonesia	▼ 435 (4.5)	8	14.6
Iran, Islamic Rep.	▼ 448 (3.8)	8	14.6
Israel 2	▼ 468 (4.9)	8	14.1
Italy	● 493 (3.9)	8	14.0
Japan	▲ 550 (2.2)	8	14.4
Jordan	▼ 450 (3.8)	8	14.0
Korea, Rep. of	▲ 549 (2.6)	8	14.4
Latvia (LSS) 1	● 503 (4.8)	8	14.5
Lithuania 1‡	● 488 (4.1)	8.5	15.2
Macedonia, Rep. of	▼ 458 (5.2)	8	14.6
Malaysia	● 492 (4.4)	8	14.4
Moldova	▼ 459 (4.0)	9	14.4
Morocco	▼ 323 (4.3)	7	14.2
Netherlands †	▲ 545 (6.9)	8	14.2
New Zealand	▲ 510 (4.9)	8.5 to 9.5	14.0
Philippines	▼ 345 (7.5)	7	14.1
Romania	● 472 (5.8)	8	14.8
Russian Federation	▲ 529 (6.4)	7 or 8	14.1
Singapore	▲ 568 (8.0)	8	14.4
Slovak Republic	▲ 535 (3.3)	8	14.3
Slovenia	▲ 533 (3.2)	8	14.8
South Africa	▼ 243 (7.8)	8	15.5
Thailand	● 482 (4.0)	8	14.5
Tunisia	▼ 430 (3.4)	8	14.8
Turkey	▼ 433 (4.3)	8	14.2

**International Avg.
(All Countries)** 488 (0.7)

	Average Scale Score	Years of Formal Schooling	Average Age
States			
Connecticut	▲ 529 (10.4)	8	14.0
Idaho	▲ 526 (6.6)	8	14.2
Illinois	▲ 521 (6.5)	8	14.2
Indiana †	▲ 534 (7.0)	8	14.4
Maryland	● 506 (7.7)	8	13.9
Massachusetts	▲ 533 (7.4)	8	14.1
Michigan	▲ 544 (8.6)	8	14.1
Missouri	▲ 523 (6.5)	8	14.3
North Carolina	● 508 (6.5)	8	14.2
Oregon	▲ 536 (6.1)	8	14.2
Pennsylvania	▲ 529 (6.5)	8	14.2
South Carolina	▲ 511 (6.7)	8	14.2
Texas	● 509 (10.4)	8	14.3

	Average Scale Score	Years of Formal Schooling	Average Age
Districts and Consortia			
Academy School Dist. #20, CO	▲ 559 (2.1)	8	14.2
Chicago Public Schools, IL	▼ 449 (9.5)	8	14.2
Delaware Science Coalition, DE	● 500 (8.4)	8	14.1
First in the World Consort., IL	▲ 565 (5.3)	8	14.2
Fremont/Lincoln/WestSide PS, NE	▲ 511 (5.8)	8	14.2
Guilford County, NC 2	▲ 534 (7.1)	8	14.2
Jersey City Public Schools, NJ	▼ 440 (9.8)	8	14.3
Miami-Dade County PS, FL	▼ 426 (10.9)	8	14.3
Michigan Invitational Group, MI	▲ 563 (6.2)	8	14.1
Montgomery County, MD 2	▲ 531 (4.3)	8	14.0
Naperville Sch. Dist. #203, IL	▲ 584 (4.1)	8	14.1
Project SMART Consortium, OH	▲ 539 (8.4)	8	14.2
Rochester City Sch. Dist., NY	▼ 452 (7.4)	8	14.2
SW Math/Sci. Collaborative, PA	▲ 543 (7.4)	8	14.2

- ▲ Participant average significantly higher than international average
- No statistically significant difference between participant average and international average
- ▼ Participant average significantly lower than international average

Significance tests adjusted for multiple comparisons

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).

† Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.6).

1 National Desired Population does not cover all of International Desired Population (see Exhibit A.3). Because coverage falls below 65%, Latvia is annotated LSS for Latvian-Speaking Schools only.

2 National Defined Population covers less than 90 percent of National Desired Population (see Exhibit A.3).

‡ Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

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

Instructions: Read across the row for a participant to compare performance with the participants listed along the top of the chart. The symbols indicate whether the average achievement of the participant in the row is significantly lower than that of the comparison participant, significantly higher than that of the comparison participant, or if there is no statistically significant difference between the average achievement of the two participants.

	Naperville Sch. Dist. #203, IL Chinese Taipei Singapore	First in the World Consort., IL Michigan Invitational Group, MI	Academy School Dist. #20, CO Hungary Japan Korea, Rep. of Netherlands	Michigan SW Math/Sci. Collaborative, PA Australia Czech Republic	Project SMART Consortium, OH England Oregon Finland Slovak Republic Belgium (Flemish)	Indiana Guilford County, NC Slovenia Massachusetts Canada	Montgomery County, MD Hong Kong, SAR Connecticut Russian Federation Pennsylvania	Idaho Missouri
Naperville Sch. Dist. #203, IL Chinese Taipei Singapore	•	•	•	•	•	•	•	•
First in the World Consort., IL Michigan Invitational Group, MI	•	•	•	•	•	•	•	•
Academy School Dist. #20, CO Hungary Japan Korea, Rep. of Netherlands	•	•	•	•	•	•	•	•
Michigan SW Math/Sci. Collaborative, PA Australia Czech Republic	•	•	•	•	•	•	•	•
Project SMART Consortium, OH England Oregon Finland Slovak Republic Belgium (Flemish)	•	•	•	•	•	•	•	•
Indiana Guilford County, NC Slovenia Massachusetts Canada	•	•	•	•	•	•	•	•
Montgomery County, MD Hong Kong, SAR Connecticut Russian Federation Pennsylvania	•	•	•	•	•	•	•	•
Idaho Missouri	•	•	•	•	•	•	•	•
United States	•	•	•	•	•	•	•	•
Fremont/Lincoln/WestSide PS, NE South Carolina New Zealand Texas North Carolina	•	•	•	•	•	•	•	•
Maryland Latvia (LSS) Delaware Science Coalition, DE	•	•	•	•	•	•	•	•
Italy Malaysia Lithuania Thailand Romania Israel Cyprus	•	•	•	•	•	•	•	•
Moldova Macedonia, Rep. of Rochester City Sch. Dist., NY Jordan Chicago Public Schools, IL	•	•	•	•	•	•	•	•
Jersey City Public Schools, NJ Iran, Islamic Rep. Indonesia Turkey Tunisia	•	•	•	•	•	•	•	•
Miami-Dade County PS, FL Chile Philippines Morocco South Africa	•	•	•	•	•	•	•	•

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).



How Do Benchmarking Participants Compare with International Benchmarks of Science Achievement?

The TIMSS science achievement scale summarizes student performance on test items designed to measure a wide range of student knowledge and proficiency. In order to provide meaningful descriptions of what performance could mean in terms of the science that students know and can do, TIMSS identified four points on the scale for use as international benchmarks⁵

14

el. and Lithuania are benchmarking participants
 the Science Committee, came fairly close, no entity
 7. The top high-performing entities
 g. Lithuania had the greatest percentage of students reaching each bench-
 r. and Lithuania had the greatest percentage of high-performing entities had lesser percentages.
 Among the top 10, the number of students reaching each benchmark, the Naperville School of
 Vi. The number of students reaching each benchmark, the Naperville School of

30

Hong Kong,
 uania, and Thailand, had greater percentages of students
 Median and Lower Quarter Benchmarks than might be
 m their percentages of high-performing students

• Top 10% Benchmark

Students demonstrate a grasp of some complex and abstract science concepts. They can apply understanding of earth's formation and cycles and of the complexity of living organisms. They show understanding of the principles of energy efficiency, phase change, thermal expansion, light properties, gravitational force, basic structure of matter, and chemical versus physical changes. They demonstrate detailed knowledge of environmental and resource issues. They understand some fundamentals of scientific investigation and can apply basic physical principles to solve some quantitative problems. They can provide written explanations and use diagrams to communicate scientific knowledge.

90th Percentile: 616

• Upper Quarter Benchmark

Students demonstrate conceptual understanding of some science cycles, systems, and principles. They have some understanding of the earth's processes, biological systems and populations, chemical reactions, and composition of matter. They solve physics problems related to light, speed, heat, and temperature and demonstrate basic knowledge of major environmental concerns. They demonstrate some scientific inquiry skills. They can combine information to draw conclusions; interpret information in diagrams, graphs and tables to solve problems; and provide short explanations conveying scientific knowledge in the life sciences.

75th Percentile: 558

• Median Benchmark

Students can recognize and communicate basic scientific knowledge across a range of topics. They recognize some characteristics of the solar system, ecosystems, animals and plants, energy sources, force and motion, light reflection and radiation, sound, electrical circuits, and human impact on the environment. They can apply and briefly communicate practical knowledge, extract tabular information, extrapolate from data presented in a simple linear graph, and interpret representational diagrams.

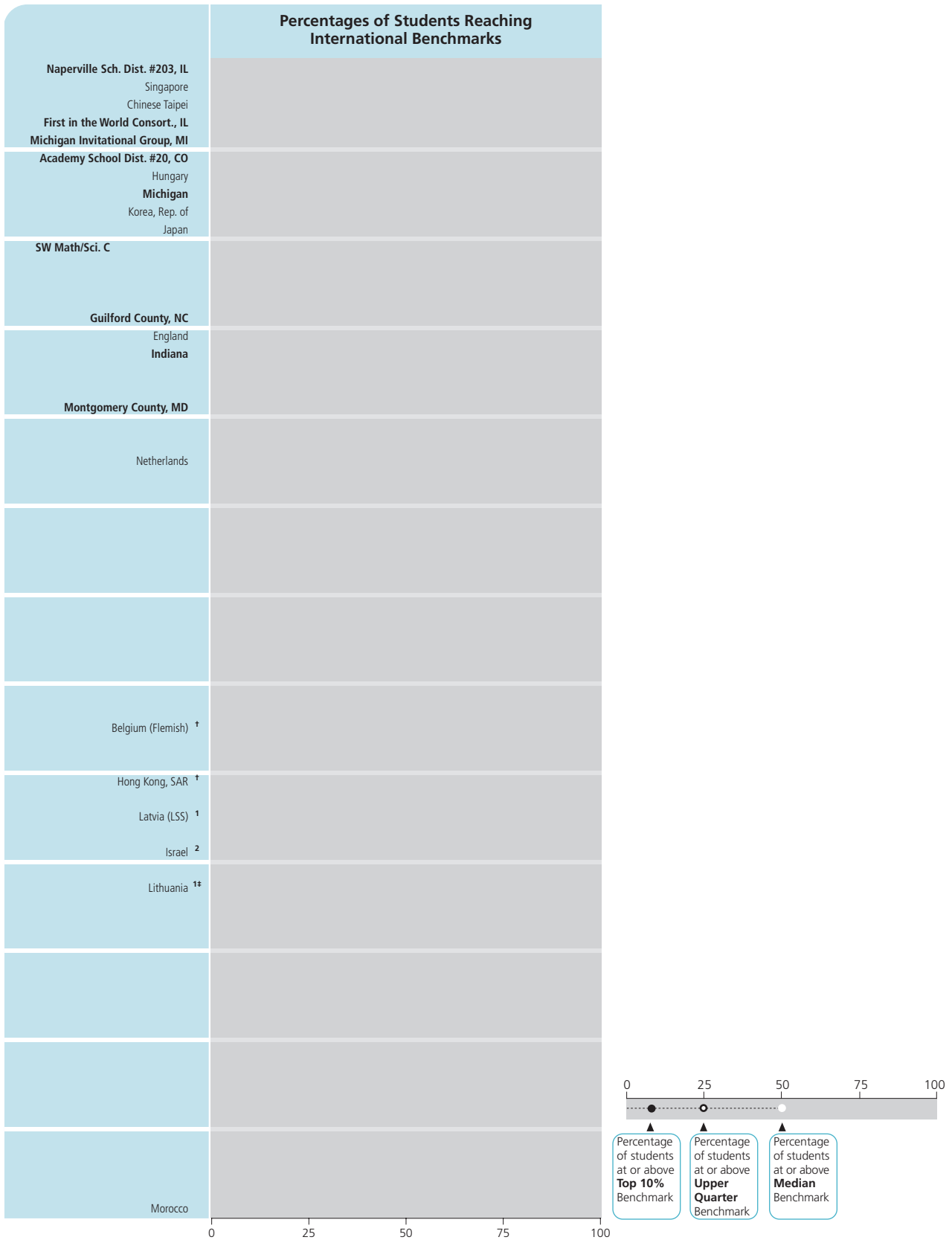
50th Percentile: 488

• Lower Quarter Benchmark

Students recognize some basic facts from the earth, life, and physical sciences presented using non-technical language. They can identify some of the earth's physical features, have some knowledge of the human body, and demonstrate familiarity with everyday physical phenomena. They can interpret and use information presented in simple diagrams.

25th Percentile: 410

The international benchmarks are based on the combined data from the countries participating in 1999.



	Top 10%	Upper Quarter	Median	Lower Quarter		Top 10%	Upper Quarter	Median	Lower Quarter
Countries					States				
United States	15 (1.2)	34 (1.9)	62 (2.0)	85 (1.3)	Connecticut	17 (3.0)	39 (4.4)	69 (4.6)	90 (2.5)
Australia	19 (1.6)	43 (2.3)	74 (2.0)	93 (0.9)	Idaho	13 (1.8)	37 (3.2)	70 (3.3)	91 (1.8)
Belgium (Flemish) †	11 (1.4)	39 (1.6)	76 (1.8)	96 (1.1)	Illinois	14 (1.9)	36 (3.0)	66 (3.0)	88 (1.5)
Bulgaria	14 (2.1)	34 (2.5)	65 (2.2)	88 (1.5)	Indiana †	18 (2.5)	41 (3.6)	72 (2.8)	92 (1.4)
Canada	14 (0.9)	38 (1.3)	73 (1.2)	94 (0.6)	Maryland	12 (1.3)	31 (3.0)	59 (3.5)	84 (2.5)
Chile	1 (0.4)	5 (1.0)	22 (1.6)	56 (1.7)	Massachusetts	17 (2.4)	40 (3.0)	71 (3.4)	92 (1.7)
Chinese Taipei	31 (1.9)	58 (2.0)	83 (1.3)	95 (0.7)	Michigan	22 (2.6)	47 (3.6)	75 (3.4)	91 (2.2)
Cyprus	2 (0.5)	12 (0.8)	39 (1.6)	74 (1.4)	Missouri	14 (2.3)	36 (3.0)	67 (2.8)	89 (1.8)
Czech Republic	17 (1.7)	41 (2.2)	74 (1.8)	95 (0.8)	North Carolina	11 (1.4)	30 (2.9)	60 (3.4)	85 (2.1)
England †	19 (1.9)	42 (2.3)	72 (2.0)	92 (1.0)	Oregon	19 (2.3)	43 (2.7)	73 (2.6)	91 (1.9)
Finland	14 (1.4)	39 (1.9)	74 (1.5)	95 (0.7)	Pennsylvania	15 (1.5)	38 (2.5)	70 (3.2)	91 (1.6)
Hong Kong, SAR †	10 (1.1)	35 (2.1)	75 (2.1)	95 (1.0)	South Carolina	13 (1.8)	34 (2.7)	60 (3.4)	85 (1.7)
Hungary	22 (1.4)	49 (1.7)	79 (1.4)	95 (0.8)	Texas	15 (2.1)	35 (3.6)	61 (4.5)	83 (3.3)
Indonesia	1 (0.3)	6 (0.9)	27 (1.6)	64 (2.4)	Districts and Consortia				
Iran, Islamic Rep.	2 (0.3)	9 (1.0)	32 (1.7)	68 (1.7)	Academy School Dist. #20, CO	23 (1.6)	52 (1.5)	84 (1.2)	97 (0.6)
Israel ²	7 (0.6)	20 (1.2)	45 (1.9)	72 (2.0)	Chicago Public Schools, IL	3 (1.1)	11 (2.4)	34 (3.9)	67 (3.8)
Italy	7 (0.9)	23 (1.7)	54 (2.0)	83 (1.2)	Delaware Science Coalition, DE	10 (1.8)	29 (4.0)	56 (4.2)	83 (2.1)
Japan	19 (1.1)	48 (1.4)	80 (1.0)	96 (0.5)	First in the World Consort., IL	27 (3.7)	54 (3.6)	85 (2.0)	97 (0.9)
Jordan	4 (0.5)	15 (1.0)	38 (1.5)	66 (1.6)	Fremont/Lincoln/WestSide PS, NE	11 (1.7)	32 (3.1)	63 (3.2)	86 (2.1)
Korea, Rep. of	22 (1.1)	46 (1.2)	77 (1.0)	94 (0.5)	Guilford County, NC ²	19 (2.5)	43 (3.6)	69 (3.5)	90 (2.0)
Latvia (LSS) ¹	7 (1.3)	24 (2.5)	59 (2.0)	88 (1.4)	Jersey City Public Schools, NJ	3 (1.5)	11 (3.1)	31 (3.6)	64 (3.5)
Lithuania ^{†*}	6 (0.9)	20 (1.9)	51 (2.1)	83 (1.8)	Miami-Dade County PS, FL	4 (1.4)	10 (2.4)	28 (3.0)	58 (3.7)
Macedonia, Rep. of	4 (0.5)	15 (1.6)	40 (1.9)	70 (2.2)	Michigan Invitational Group, MI	25 (3.1)	54 (3.0)	84 (2.1)	96 (1.1)
Malaysia	6 (0.9)	21 (1.9)	53 (2.2)	85 (1.5)	Montgomery County, MD ²	17 (1.1)	40 (2.5)	70 (2.3)	91 (1.3)
Moldova	4 (0.5)	15 (1.2)	39 (1.8)	70 (1.6)	Naperville Sch. Dist. #203, IL	33 (2.5)	64 (2.2)	90 (1.2)	98 (0.6)
Morocco	0 (0.0)	1 (0.2)	5 (0.5)	20 (1.1)	Project SMART Consortium, OH	19 (3.6)	43 (5.0)	73 (3.3)	93 (1.1)
Netherlands †	16 (2.3)	46 (3.8)	79 (3.5)	95 (1.6)	Rochester City Sch. Dist., NY	3 (1.3)	12 (2.5)	33 (3.7)	68 (3.0)
New Zealand	12 (1.4)	32 (2.1)	61 (2.2)	86 (1.6)	SW Math/Sci. Collaborative, PA	19 (3.1)	45 (3.6)	75 (3.5)	94 (1.7)
Philippines	1 (0.3)	3 (0.7)	13 (1.7)	31 (2.6)	<div style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;"> <p>Top 10% Benchmark (90th Percentile) = 616</p> <p>Upper Quarter Benchmark (75th Percentile) = 558</p> <p>Median Benchmark (50th Percentile) = 488</p> <p>Lower Quarter Benchmark (25th Percentile) = 410</p> </div>				
Romania	6 (0.8)	19 (1.9)	45 (2.5)	75 (2.1)					
Russian Federation	17 (2.4)	38 (2.8)	68 (2.5)	90 (1.0)					
Singapore	32 (3.3)	56 (3.5)	80 (2.6)	94 (1.4)					
Slovak Republic	14 (1.4)	39 (2.0)	74 (1.7)	94 (0.7)					
Slovenia	16 (1.1)	39 (1.7)	71 (1.5)	93 (0.7)					
South Africa	0 (0.2)	2 (0.6)	6 (1.4)	13 (2.0)					
Thailand	3 (0.7)	15 (2.0)	47 (2.5)	84 (1.3)					
Tunisia	0 (0.1)	3 (0.4)	19 (1.5)	62 (2.0)					
Turkey	1 (0.2)	6 (0.8)	25 (1.8)	62 (2.4)					

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).

† Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.6).

¹ National Desired Population does not cover all of International Desired Population (see Exhibit A.3). Because coverage falls below 65%, Latvia is annotated LSS for Latvian-Speaking Schools only.

² National Defined Population covers less than 90 percent of National Desired Population (see Exhibit A.3).


* Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

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

What Are the Gender Differences in Science Achievement?

Exhibit 1.5 presents average science achievement separately for girls and boys for each of the participating entities, as well as the difference between the means, in increasing order of the difference. The gender difference for each entity is shown by a bar indicating the amount of the difference, whether its direction favored girls or boys, and whether it is statistically significant (a darkened bar).

It is disappointing that in science at the eighth grade, the TIMSS 1999 Benchmarking Study shows relatively unequal average achievement for girls and boys in many of the Benchmarking jurisdictions, and in the United States overall. Boys had significantly higher average science achievement than girls in 10 of the 13 Benchmarking states, with Massachusetts, South Carolina, and Texas the exceptions. Gender differences were less prevalent among the Benchmarking districts and consortia, with significant differences in just four jurisdictions: the First in the World



The gender difference in science at the country level is more apparent among high-performing students, although internationally it was about the same at both the upper quarter and median levels. On average across countries, 29 percent of boys reached the upper quarter level, compared with 21 percent of girls, a statistically significant difference of eight percentage points. Similarly, the international average percentage of boys reaching the median level was 54 percent and of girls 46 percent, also a significant difference of eight percentage points. Perhaps more important, however, Exhibit 1.6 shows that in 21 countries the percentage of boys reaching the upper quarter level was significantly greater than the percentage of girls, whereas this was the case in 13 countries at the median level. In no country did the percentage of girls reaching either level significantly exceed the percentage of boys.

The gender differences found among the Benchmarking states are consistent with the results of TIMSS in both 1995 and 1999, which showed a pervasive difference in science achievement favoring boys, far more evident than in mathematics.⁸ They are also consistent with the results from the second IEA science study conducted in 1983-84, which for 14-year-olds found standard score differences favoring boys in all 23 of the participating countries.⁹

⁸ 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: The IEA's Third International Mathematics and Science Study (TIMSS)*, Chestnut Hill, MA: Boston College; 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 Science Report: Findings from IEA's Repeat of the Third International Mathematics and Science Study at the Eighth Grade*, Chestnut Hill, MA: Boston College.

⁹ Postlethwaite, T.N. and Wiley, D.E. (1992), *The IEA Study of Science II: Science Achievement in Twenty-Three Countries*, New York, NY: Pergamon Press.

Macedonia, Rep. of			
Turkey			
Thailand			
New Zealand			
Project SMART Consortium, OH			
Romania			
Academy School Dist. #20, CO			
Malaysia			
Finland			
Cyprus			
Moldova			
South Carolina			
Philippines			
Massachusetts			
Slovenia			
Japan			
Bulgaria			
Canada			
Israel ²			
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	Girls' Average Scale Score	Boys' Average Scale Score	Difference (Absolute Value)		Girls' Average Scale Score	Boys' Average Scale Score	Difference (Absolute Value)
Countries				States			
United States	505 (4.6)	524 (5.5) ▲	19 (4.1)	Connecticut	518 (10.2)	542 (11.4) ▲	24 (6.6)
Australia	532 (5.1)	549 (6.0)	18 (6.8)	Idaho	515 (6.4)	537 (7.5) ▲	22 (4.4)
Belgium (Flemish) †	526 (4.6)	544 (7.2)	18 (10.3)	Illinois	508 (7.5)	533 (6.7) ▲	25 (5.0)
Bulgaria	511 (5.8)	525 (6.5)	14 (6.2)	Indiana †	523 (7.0)	545 (7.5) ▲	22 (4.3)
Canada	526 (3.2)	540 (2.4) ▲	14 (3.9)	Maryland	498 (7.7)	516 (8.3) ▲	18 (4.1)
Chile	409 (4.3)	432 (5.1) ▲	23 (6.2)	Massachusetts	527 (7.5)	540 (8.0)	13 (4.8)
Chinese Taipei	561 (3.9)	578 (5.7) ▲	17 (4.2)	Michigan	533 (8.9)	556 (8.9) ▲	24 (4.8)
Cyprus	455 (3.1)	465 (3.0)	10 (3.9)	Missouri	512 (7.0)	534 (7.2) ▲	23 (6.1)
Czech Republic	523 (4.8)	557 (4.9) ▲	33 (4.8)	North Carolina	498 (6.9)	520 (7.3) ▲	22 (5.0)
England †	522 (6.2)	554 (5.3) ▲	32 (6.6)	Oregon	524 (6.5)	549 (7.3) ▲	25 (6.5)
Finland	530 (4.0)	540 (4.5)	10 (5.0)	Pennsylvania	519 (7.1)	540 (6.9) ▲	21 (4.6)
Hong Kong, SAR †	522 (4.4)	537 (5.1)	14 (6.1)	South Carolina	506 (7.7)	517 (7.4)	11 (6.9)
Hungary	540 (4.0)	565 (4.5) ▲	25 (4.2)	Texas	499 (9.9)	519 (12.2)	20 (6.8)
Indonesia	427 (6.5)	444 (4.8)	17 (6.8)	Districts and Consortia			
Iran, Islamic Rep.	430 (5.7)	461 (4.4) ▲	31 (7.6)	Academy School Dist. #20, CO	554 (3.6)	563 (3.4)	9 (5.6)
Israel 2	461 (6.0)	476 (5.5)	14 (6.1)	Chicago Public Schools, IL	442 (10.1)	458 (10.0)	16 (6.6)
Italy	484 (4.1)	503 (5.6)	18 (5.8)	Delaware Science Coalition, DE	491 (9.2)	511 (9.5)	20 (8.3)
Japan	543 (2.8)	556 (3.6)	14 (4.6)	First in the World Consort., IL	553 (6.2)	578 (6.0) ▲	26 (5.9)
Jordan	460 (5.0)	442 (5.9)	18 (8.2)	Fremont/Lincoln/WestSide PS, NE	503 (6.5)	519 (7.6)	15 (8.1)
Korea, Rep. of	538 (4.0)	559 (3.2) ▲	21 (5.1)	Guilford County, NC 2	522 (7.2)	547 (8.7) ▲	25 (7.3)
Latvia (LSS) 1	495 (5.6)	510 (4.8) ▲	15 (4.0)	Jersey City Public Schools, NJ	432 (10.5)	448 (10.7)	16 (7.0)
Lithuania 1*	478 (4.4)	499 (5.0) ▲	21 (4.6)	Miami-Dade County PS, FL	416 (9.4)	435 (12.8)	18 (6.9)
Macedonia, Rep. of	458 (6.0)	458 (5.4)	1 (4.6)	Michigan Invitational Group, MI	555 (6.3)	572 (7.4)	16 (5.9)
Malaysia	488 (5.5)	498 (5.8)	9 (7.0)	Montgomery County, MD 2	523 (5.7)	540 (5.6)	17 (7.4)
Moldova	454 (4.4)	465 (5.4)	11 (5.4)	Naperville Sch. Dist. #203, IL	576 (4.8)	592 (4.6) ▲	17 (4.9)
Morocco	312 (5.9)	330 (5.9)	18 (8.3)	Project SMART Consortium, OH	536 (8.9)	543 (9.0)	7 (6.2)
Netherlands †	536 (7.1)	554 (7.3) ▲	18 (4.1)	Rochester City Sch. Dist., NY	443 (8.7)	461 (8.2)	18 (8.0)
New Zealand	506 (5.4)	513 (7.0)	7 (7.8)	SW Math/Sci. Collaborative, PA	529 (7.6)	558 (7.7) ▲	30 (3.5)
Philippines	351 (8.2)	339 (8.9)	12 (8.4)				
Romania	468 (6.4)	475 (6.5)	7 (5.4)				
Russian Federation	519 (7.1)	540 (6.2) ▲	20 (3.9)				
Singapore	557 (7.9)	578 (9.7)	20 (7.9)				
Slovak Republic	525 (3.4)	546 (4.5) ▲	21 (4.5)				
Slovenia	527 (3.7)	540 (3.7) ▲	13 (3.7)				
South Africa	234 (9.2)	253 (7.7)	19 (6.7)				
Thailand	481 (4.6)	484 (4.4)	3 (4.3)				
Tunisia	417 (3.3)	442 (4.3) ▲	25 (3.4)				
Turkey	431 (4.8)	434 (4.3)	3 (2.9)				
International Avg. (All Countries)	480 (0.9)	495 (0.9) ▲	15 (0.8)				

▲ Significantly higher than other gender

Significance tests adjusted for multiple comparisons

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).

† Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.6).

1 National Desired Population does not cover all of International Desired Population (see Exhibit A.3). Because coverage falls below 65%, Latvia is annotated LSS for Latvian-Speaking Schools only.

2 National Defined Population covers less than 90 percent of National Desired Population (see Exhibit A.3).

* Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

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

	Upper Quarter		Median	
	Percent of Girls	Percent of Boys	Percent of Girls	Percent of Boys
States				
Connecticut	20 (2.7)	30 (4.5) ▲	45 (4.7)	55 (5.0)
Idaho	19 (2.4)	31 (3.2) ▲	44 (3.6)	56 (3.2) ▲
Illinois	20 (2.5)	30 (3.3) ▲	46 (3.4)	55 (3.2) ▲
Indiana †	19 (2.7)	31 (3.3) ▲	45 (3.4)	55 (4.0) ▲
Maryland	21 (2.3)	29 (2.7)	46 (3.4)	54 (3.3) ▲
Massachusetts	21 (2.9)	29 (2.8)	46 (3.7)	54 (3.3)
Michigan	19 (2.8)	31 (3.2) ▲	44 (3.6)	56 (3.5) ▲
Missouri	19 (2.9)	31 (2.8) ▲	44 (3.6)	56 (2.5) ▲
North Carolina	20 (2.6)	30 (3.0) ▲	45 (3.4)	55 (3.0) ▲
Oregon	19 (2.3)	31 (2.8) ▲	44 (2.9)	56 (3.3) ▲
Pennsylvania	20 (2.2)	31 (2.2) ▲	45 (4.4)	56 (3.0) ▲
South Carolina	21 (2.6)	29 (3.0)	48 (3.9)	52 (3.4)
Texas	20 (2.6)	30 (3.7) ▲	45 (4.2)	55 (4.9) ▲
Districts and Consortia				
Academy School Dist. #20, CO	22 (1.9)	28 (2.0)	46 (2.3)	54 (2.4)
Chicago Public Schools, IL	22 (3.7)	28 (4.3)	47 (4.9)	54 (5.1)
Delaware Science Coalition, DE	21 (3.7)	30 (4.3)	46 (4.9)	54 (4.5)
First in the World Consort., IL	18 (3.2)	33 (2.9) ▲	43 (3.4)	57 (4.2)
Fremont/Lincoln/WestSide PS, NE	21 (2.2)	29 (2.7)	47 (3.9)	53 (4.1)
Guilford County, NC ²	19 (2.3)	32 (3.4) ▲	44 (4.2)	57 (4.0)
Jersey City Public Schools, NJ	22 (3.8)	28 (4.2)	46 (3.9)	54 (4.2)
Miami-Dade County PS, FL	22 (3.3)	28 (3.5)	47 (4.4)	53 (4.2)
Michigan Invitational Group, MI	21 (2.5)	30 (3.3)	46 (3.3)	54 (4.6)
Montgomery County, MD ²	22 (1.4)	28 (2.8)	46 (2.6)	54 (2.3)
Naperville Sch. Dist. #203, IL	22 (2.8)	28 (2.6)	46 (3.3)	54 (3.0)
Project SMART Consortium, OH	22 (4.1)	28 (4.4)	47 (5.4)	53 (4.6)
Rochester City Sch. Dist., NY	21 (3.2)	29 (3.9)	47 (4.6)	54 (3.7)
SW Math/Sci. Collaborative, PA	18 (2.6)	32 (3.4) ▲	43 (3.6)	58 (4.2) ▲

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

▲ Significantly greater percentage than other gender

Significance tests adjusted for multiple comparisons

