CHAPTER 3

Average Achievement in the Science Content Areas

Chapter 3 presents results by the major content areas in science to provide information about the possible effects of curricular variation on average achievement. Average performance is provided for six content areas: earth science; life science; physics; chemistry; environmental and resource issues; scientific inquiry and the nature of science.

As delineated by the curriculum of the countries around the world and in the Benchmarking entities, science contains a range of content areas (see Chapter 5 on curriculum). For example, almost all TIMSS 1999 countries and Benchmarking participants reported some elements of earth science, life science, physics, and chemistry in the eighth-grade science curriculum. Since these content areas can differ in complexity, enter the curriculum at different times, receive varying degrees of emphasis, or even be taught as separate courses, Chapter 3 presents results by the major content areas in science. For each Benchmarking entity, average achievement is shown for each content area and compared with the international average for that content area, and average achievement in the content areas is profiled in relation to overall science achievement. Results are also provided by gender. These different perspectives are provided to identify the relative strengths and weaknesses of students in the different science content areas as well as the possible effects of curricular variation on average achievement.

The TIMSS 1999 science test for the eighth grade was designed to enable reporting by six content areas in accordance with the TIMSS science framework. These areas, with their main topics, are:

- Earth science

  Includes earth features, earth processes, and earth in the universe

- Life science

  Includes diversity, organization and structure of living things; life processes and systems enabling life functions; life spirals, genetic continuity and diversity; interactions of living things; and human biology and health

- Physics

  Includes physical properties and transformations; energy and physical processes; and forces and motion

- Chemistry

  Includes classification and structure of matter; chemical properties; and chemical transformations

- Environmental and resource issues

  Includes pollution; conservation of land, water, and sea resources; conservation of material and energy resources; world population; food supply and production; and effects of natural disasters

- Scientific inquiry and the nature of science

  Includes the nature of scientific knowledge; the scientific enterprise; interactions of science, technology, mathematics, and society; and the tools, procedures, and processes used in conducting scientific investigations.

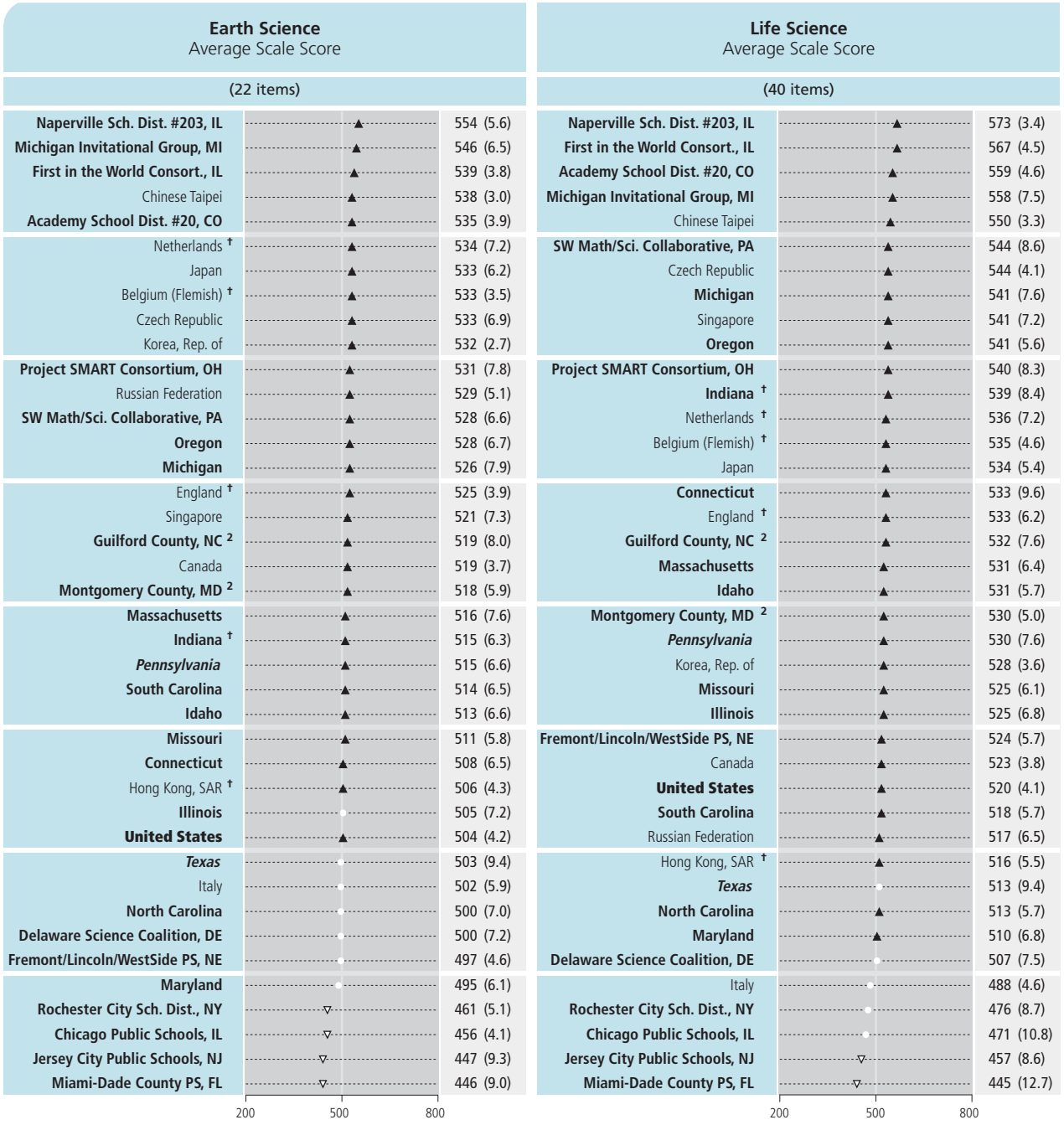
How Does Achievement Differ Across Science Content Areas?

Exhibit 3.1 presents average achievement in each of the six science content areas for the Benchmarking states, districts, and consortia. The Benchmarking jurisdictions as well as selected reference countries are displayed in decreasing order of achievement for each content area, and symbols indicate whether performance is statistically significantly above or below the international average. To allow comparison of the relative performance of each country in each content area, the international average for each content area was scaled to be 488, the same as the overall international average.

The countries scoring highest in the overall science assessment – Chinese Taipei, Singapore, Japan, Korea, and the Netherlands – were generally also the highest scorers in each content area, although with some exceptions and not necessarily in that order. Similarly, the Benchmarking jurisdictions with the highest overall performance – the Naperville School District, the First in the World Consortium, the Michigan Invitational Group, and the Academy School District – were also the highest-scoring jurisdictions in five of the six science content areas (all except scientific inquiry and the nature of science). In all content areas, these Benchmarking participants had average achievement comparable to that of the highest-scoring countries. The four participants with the lowest overall performance – the Rochester City School District, the Chicago Public Schools, the Jersey City Public Schools, and the Miami-Dade County Public Schools – also had the lowest performance in each content area.

In contrast to the consistent performance across content areas displayed by the highest- and lowest-performing entities, performance varied more for entities in the middle of the overall performance distribution. The United States, which performed significantly above the international average in the overall assessment, also had above-average performance in each of the content areas except physics. Performance in Connecticut, Idaho, and Guilford County followed the U.S. pattern. In life science and in scientific inquiry and the nature of science, the two areas in which the United States performed best, some of the lowest-performing Benchmarking participants had more success than in the other content areas. Rochester and Chicago performed at about the international average in both content areas, and Jersey City and Miami-Dade in scientific inquiry and the nature of science.

Exhibits B.1 through B.6 in Appendix B compare average achievement among individual entities for each of the content areas. The exhibits show whether or not the differences in average achievement between pairs of participating entities are statistically significant.



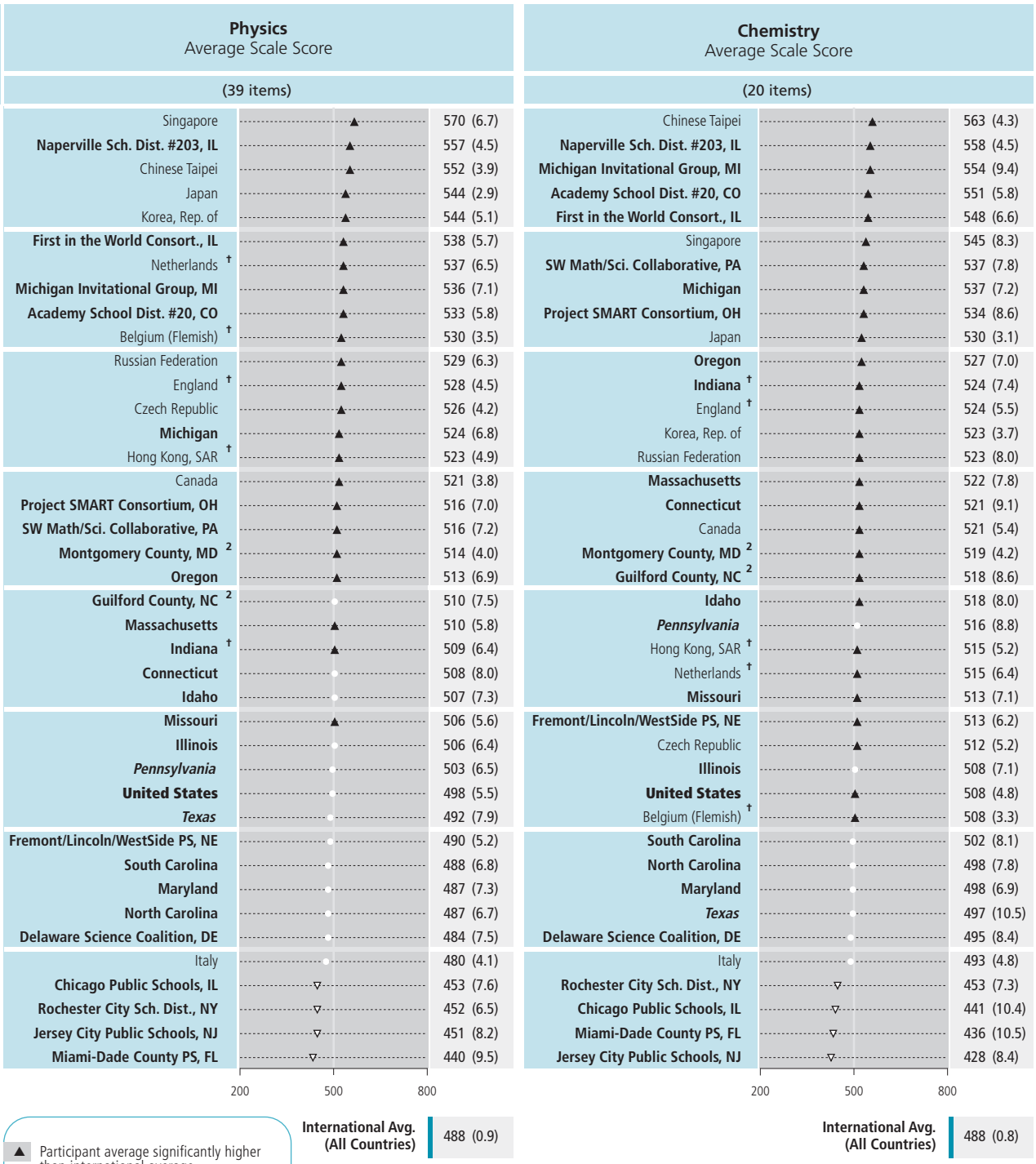
SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

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).

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

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



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

Environmental and Resource Issues
Average Scale Score

(13 items)

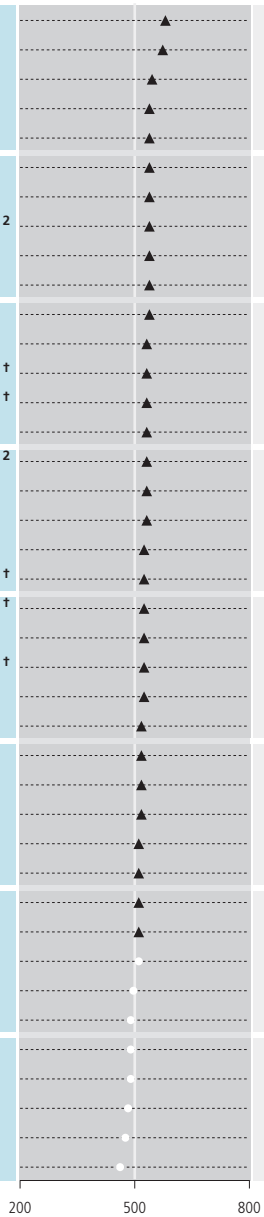
Singapore	577 (8.3)
Chinese Taipei	567 (4.0)
Naperville Sch. Dist. #203, IL	566 (6.9)
Michigan Invitational Group, MI	550 (8.0)
First in the World Consort., IL	549 (5.9)
Academy School Dist. #20, CO	540 (5.7)
Guilford County, NC [2]	531 (9.3)
Michigan	529 (7.5)
SW Math/Sci. Collaborative, PA	528 (6.8)
Indiana †	527 (7.1)
Netherlands †	526 (8.5)
Project SMART Consortium, OH	525 (7.8)
Korea, Rep. of	523 (4.5)
Idaho	522 (7.1)
Pennsylvania	522 (8.3)
Massachusetts	522 (8.1)
Canada	521 (3.5)
Oregon	520 (6.5)
Hong Kong, SAR †	518 (4.9)
England †	518 (5.8)
Montgomery County, MD [2]	517 (6.4)
Czech Republic	516 (5.7)
Connecticut	515 (7.5)
Missouri	514 (7.2)
Belgium (Flemish) †	513 (3.5)
Illinois	513 (6.8)
United States	509 (6.4)
Fremont/Lincoln/WestSide PS, NE	508 (5.2)
Japan	506 (5.5)
South Carolina	505 (9.1)
North Carolina	505 (7.2)
Maryland	505 (6.4)
Texas	502 (9.6)
Russian Federation	495 (6.6)
Delaware Science Coalition, DE	494 (7.3)
Italy	491 (5.4)
Jersey City Public Schools, NJ	451 (10.1)
Chicago Public Schools, IL	442 (9.8)
Rochester City Sch. Dist., NY	438 (9.6)
Miami-Dade County PS, FL	426 (11.9)

International Avg. (All Countries) 488 (0.7)

Scientific Inquiry and the Nature of Science
Average Scale Score

(12 items)

Naperville Sch. Dist. #203, IL	581 (3.8)
First in the World Consort., IL	574 (8.8)
Singapore	550 (5.9)
Korea, Rep. of	545 (7.3)
Michigan Invitational Group, MI	545 (5.1)
Japan	543 (2.8)
Massachusetts	542 (4.7)
Montgomery County, MD [2]	542 (4.4)
SW Math/Sci. Collaborative, PA	541 (5.9)
Academy School Dist. #20, CO	541 (5.1)
Chinese Taipei	540 (4.9)
Michigan	538 (6.8)
England †	538 (5.1)
Netherlands †	534 (6.5)
Connecticut	533 (7.3)
Guilford County, NC [2]	533 (6.8)
Canada	532 (5.1)
Illinois	532 (8.3)
Pennsylvania	531 (5.4)
Hong Kong, SAR †	531 (2.8)
Indiana †	527 (5.0)
Project SMART Consortium, OH	527 (8.7)
Belgium (Flemish) †	526 (4.9)
Oregon	525 (6.0)
Maryland	524 (5.4)
United States	522 (4.3)
Czech Republic	522 (5.7)
South Carolina	521 (6.7)
North Carolina	516 (5.1)
Missouri	515 (4.1)
Texas	514 (7.6)
Idaho	513 (7.1)
Fremont/Lincoln/WestSide PS, NE	511 (8.4)
Delaware Science Coalition, DE	501 (7.3)
Jersey City Public Schools, NJ	492 (9.8)
Chicago Public Schools, IL	491 (8.1)
Russian Federation	491 (4.9)
Italy	489 (4.6)
Rochester City Sch. Dist., NY	476 (7.9)
Miami-Dade County PS, FL	462 (9.4)



International Avg. (All Countries) 488 (0.7)

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

▲ Participant average significantly higher than international average

● Participant average not significantly different from international average

▽ Participant average significantly lower than international average

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).

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

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

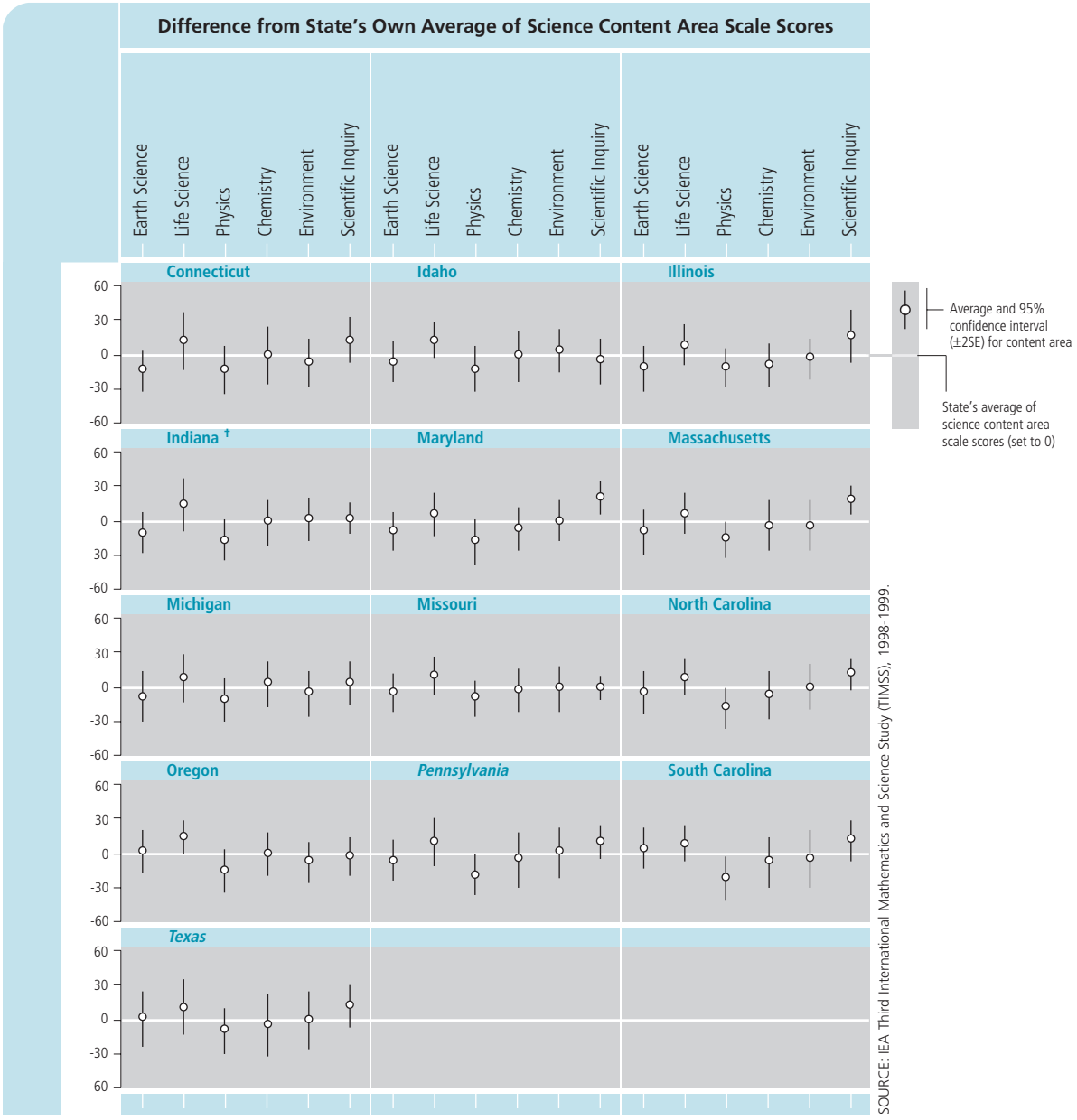
In Which Content Areas Are Countries Relatively Strong or Weak?

For purposes of comparison, Exhibit 3.2 profiles the relative performance in science content areas within the comparison countries, while Exhibit 3.3 provides the corresponding information for the Benchmarking states and Exhibit 3.4 for the districts and consortia. These exhibits display the difference between average performance in each content area and average science performance overall, highlighting any variation. The profiles reveal that as in the participating countries, students in many of the Benchmarking jurisdictions performed relatively better or worse in several content areas than they did overall. For example, the Benchmarking entities generally approximated the U.S. pattern of performing better in life science and in scientific inquiry and the nature of science than they did overall.

In particular, a number of jurisdictions had relatively high performance in scientific inquiry and the nature of science, including Maryland, Massachusetts, Chicago, Jersey City, Montgomery County, and Naperville. Although the difference was not large, physics was the content area in which the performance of students in the United States was weakest relative to overall science performance. Several of the Benchmarking participants also had relatively low physics performance, although only in South Carolina and the Fremont/Lincoln/Westside Public Schools was the difference statistically significant.

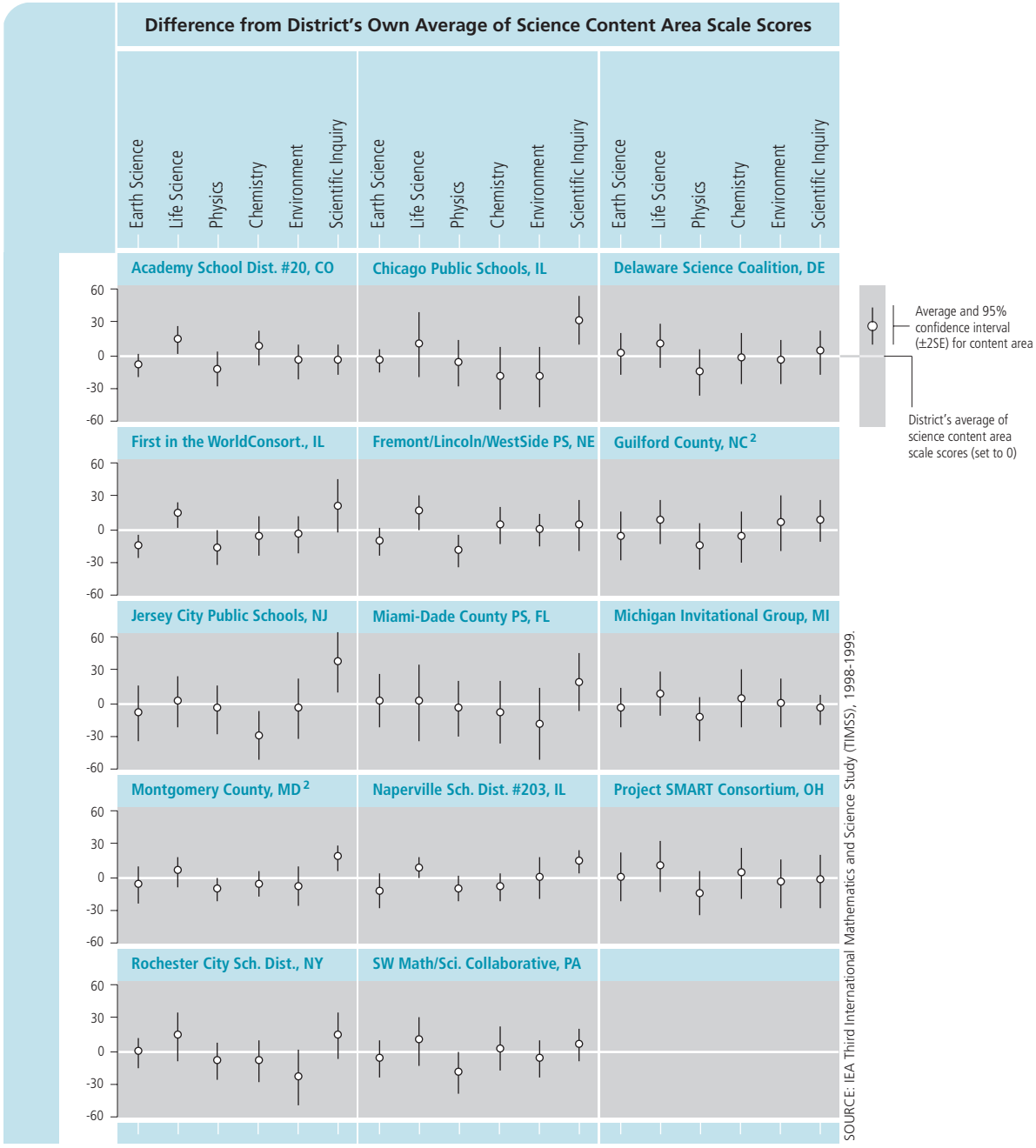
Differences in relative performance may be related to one or more of a number of factors, such as emphases in intended curricula or widely used textbooks, strengths or weaknesses in curriculum implementation, and the grade level at which topics are introduced. For the Benchmarking entities, the patterns of relative strengths and weaknesses profiled in Exhibits 3.3 and 3.4 are sometimes reflected in strengths and weaknesses relative to other countries and the United States (shown in Exhibit 3.1).

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



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).



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

What Are the Gender Differences in Achievement for the Content Areas?

Exhibit 3.5 displays average achievement in science content areas by gender for the Benchmarking entities as well as for the comparison countries. On average across all the TIMSS 1999 countries, boys outperformed girls in earth science, physics, chemistry, and environmental and resource issues. In the United States this gender difference was evident only in earth science. There were no gender differences in any country or Benchmarking participant in scientific inquiry and the nature of science; in life science, only the First in the World Consortium had a significant difference, in favor of boys. Among Benchmarking participants, gender differences were relatively rare, and were found mostly in physics, chemistry, and earth science. In physics, boys significantly outperformed girls in Connecticut, Illinois, North Carolina, Oregon, Texas, First in the World, Guilford County, Naperville, and the Southwest Pennsylvania Math and Science Collaborative. In chemistry, boys performed better in Indiana, Massachusetts, Oregon, Pennsylvania, Chicago, the Delaware Science Coalition, Guilford County, and the Southwest Pennsylvania Math and Science Collaborative. Boys scored better in earth science in Idaho, Indiana, Maryland, Michigan, and the Southwest Pennsylvania Math and Science Collaborative. Gender differences favoring boys in environmental and resource issues were found in Connecticut, Massachusetts, and Jersey City.

The patterns in the performance of girls and boys found in TIMSS 1999 are consistent with previous IEA science assessments. Girls tended to perform about the same as boys in life science in both TIMSS 1995 and the Second International Science Study (SISS),[1] while boys were markedly stronger in earth science, physics, and chemistry.

[1] 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; Beaton, A.E., Martin, M.O., Mullis, I.V.S., Gonzalez, E.J., Smith, T.A., and Kelly, D.L. (1996a), *Science Achievement in the Middle School Years: IEA's Third International Mathematics and Science Study (TIMSS)*, Chestnut Hill, MA: Boston College.

	Average Scale Scores for Science Content Areas					
	Earth Science		Life Science		Physics	
	Girls	Boys	Girls	Boys	Girls	Boys
Countries						
United States	490 (5.2)	518 (5.5) ▲	518 (4.4)	522 (5.0)	488 (6.7)	509 (6.8)
Belgium (Flemish) †	521 (5.7)	544 (8.1)	530 (5.9)	539 (8.1)	521 (4.1)	539 (7.3)
Canada	510 (8.6)	528 (3.0)	523 (5.0)	523 (4.6)	512 (4.3)	530 (4.9) ▲
Chinese Taipei	529 (7.4)	546 (7.0)	543 (3.8)	557 (6.5)	542 (6.6)	563 (6.8)
Czech Republic	513 (8.2)	554 (9.2) ▲	537 (4.8)	552 (5.7)	510 (6.2)	544 (6.8) ▲
England †	514 (6.2)	536 (6.4)	525 (6.9)	540 (7.2)	513 (5.8)	543 (5.3) ▲
Hong Kong, SAR †	499 (6.1)	513 (6.2)	512 (8.6)	520 (7.4)	514 (5.8)	532 (6.0)
Italy	493 (6.5)	512 (6.8)	482 (6.5)	494 (5.1)	469 (5.5)	490 (7.1)
Japan	527 (7.9)	539 (8.0)	532 (6.4)	536 (5.7)	537 (4.6)	552 (2.7)
Korea, Rep. of	525 (4.0)	539 (4.2)	520 (5.6)	536 (3.3)	534 (6.5)	553 (5.7)
Netherlands †	525 (8.5)	544 (10.2)	535 (9.6)	537 (7.8)	524 (6.6)	550 (7.7) ▲
Russian Federation	518 (7.4)	541 (6.3)	513 (8.6)	522 (7.6)	518 (7.3)	542 (7.5)
Singapore	510 (7.0)	532 (9.9)	536 (7.9)	546 (9.8)	557 (6.9)	581 (8.4)
States						
Connecticut	500 (8.5)	517 (6.8)	530 (10.3)	536 (10.2)	494 (8.6)	523 (8.5) ▲
Idaho	500 (6.1)	526 (8.6) ▲	526 (5.5)	535 (7.4)	494 (8.4)	519 (8.4)
Illinois	496 (7.1)	514 (12.4)	518 (7.9)	532 (8.1)	492 (7.0)	519 (7.0) ▲
Indiana †	503 (7.4)	528 (6.9) ▲	537 (9.6)	542 (8.4)	498 (7.3)	521 (7.5)
Maryland	486 (7.2)	506 (5.8) ▲	509 (7.8)	510 (8.0)	476 (8.3)	500 (9.8)
Massachusetts	508 (10.4)	524 (7.1)	531 (6.1)	532 (7.5)	503 (6.2)	517 (7.5)
Michigan	514 (8.5)	539 (8.4) ▲	538 (8.7)	544 (9.2)	512 (8.0)	536 (8.5)
Missouri	502 (6.8)	520 (6.1)	519 (7.8)	531 (5.8)	493 (8.6)	519 (6.6)
North Carolina	493 (8.6)	508 (7.7)	510 (5.5)	516 (7.2)	475 (8.4)	501 (7.3) ▲
Oregon	520 (6.7)	537 (8.6)	536 (6.9)	545 (8.1)	498 (7.4)	529 (7.9) ▲
Pennsylvania	508 (8.6)	524 (11.1)	526 (8.7)	535 (8.1)	490 (7.7)	516 (9.1)
South Carolina	507 (7.5)	521 (9.5)	518 (6.7)	518 (6.8)	481 (7.8)	496 (7.2)
Texas	494 (10.6)	511 (10.7)	509 (8.6)	516 (11.2)	477 (8.0)	507 (9.9) ▲
Districts and Consortia						
Academy School Dist. #20, CO	524 (5.3)	545 (5.3)	562 (4.2)	556 (7.6)	522 (6.7)	543 (7.3)
Chicago Public Schools, IL	451 (8.0)	462 (6.1)	470 (12.5)	473 (12.8)	445 (7.7)	463 (9.4)
Delaware Science Coalition, DE	493 (10.0)	506 (9.3)	508 (8.4)	507 (9.2)	474 (9.8)	494 (8.4)
First in the World Consort., IL	531 (6.4)	546 (6.8)	556 (5.9)	578 (5.1) ▲	522 (6.4)	553 (7.2) ▲
Fremont/Lincoln/WestSide PS, NE	487 (7.2)	507 (6.7)	528 (6.3)	520 (9.0)	479 (7.6)	501 (7.8)
Guilford County, NC [2]	514 (12.4)	526 (8.7)	525 (8.5)	540 (9.0)	493 (8.3)	530 (9.8) ▲
Jersey City Public Schools, NJ	441 (10.2)	455 (10.0)	457 (8.4)	457 (10.8)	440 (10.3)	463 (9.7)
Miami-Dade County PS, FL	436 (9.5)	455 (9.5)	439 (10.0)	449 (16.2)	432 (9.3)	447 (11.8)
Michigan Invitational Group, MI	539 (7.1)	554 (8.2)	557 (8.1)	559 (9.6)	524 (6.7)	549 (10.2)
Montgomery County, MD [2]	505 (8.8)	533 (6.7)	528 (5.4)	532 (9.2)	502 (7.9)	526 (4.5)
Naperville Sch. Dist. #203, IL	551 (8.2)	558 (7.4)	568 (5.3)	579 (4.3)	542 (6.9)	571 (5.4) ▲
Project SMART Consortium, OH	525 (9.6)	537 (8.7)	544 (10.4)	535 (8.9)	509 (8.3)	524 (9.5)
Rochester City Sch. Dist., NY	453 (7.2)	470 (6.3)	473 (9.4)	478 (9.8)	443 (6.6)	462 (8.6)
SW Math/Sci. Collaborative, PA	516 (6.7)	542 (7.7) ▲	535 (10.0)	554 (10.9)	500 (8.4)	532 (9.0) ▲
International Avg. (All Countries)	479 (1.1)	496 (1.1) ▲	487 (1.0)	488 (1.1)	477 (1.0)	498 (1.1) ▲

▲ Significantly higher than other gender

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).

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

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

	Average Scale Scores for Science Content Areas					
	Chemistry		Enviromental and Resource Issues		Scientific Inquiry and the Nature of Science	
	Girls	Boys	Girls	Boys	Girls	Boys
Countries						
United States	495 (6.1)	520 (7.0)	500 (7.0)	519 (9.6)	521 (5.4)	523 (6.2)
Belgium (Flemish) †	500 (6.6)	515 (6.4)	503 (5.3)	523 (8.1)	528 (5.7)	524 (7.2)
Canada	512 (6.3)	531 (7.4)	514 (4.8)	529 (6.0)	535 (5.4)	530 (5.3)
Chinese Taipei	555 (4.1)	571 (8.3)	555 (6.7)	579 (4.9)	544 (5.3)	537 (5.4)
Czech Republic	492 (6.7)	532 (8.8) ▲	502 (5.8)	530 (7.1) ▲	524 (4.9)	519 (8.9)
England †	503 (6.8)	543 (6.6) ▲	503 (7.5)	532 (5.6) ▲	536 (5.7)	540 (8.3)
Hong Kong, SAR †	508 (8.3)	522 (4.5)	510 (5.4)	526 (6.2)	535 (3.2)	527 (4.0)
Italy	485 (7.0)	501 (5.1)	482 (6.4)	499 (4.9) ▲	486 (5.4)	492 (5.8)
Japan	522 (5.0)	537 (2.7)	500 (8.6)	511 (5.9)	546 (6.3)	540 (5.9)
Korea, Rep. of	515 (9.1)	532 (5.5)	516 (3.0)	529 (7.5)	547 (10.1)	544 (6.5)
Netherlands †	505 (7.3)	526 (7.5)	517 (10.4)	536 (9.0)	539 (8.8)	530 (9.1)
Russian Federation	516 (9.9)	531 (7.6)	490 (7.5)	499 (9.5)	491 (4.3)	491 (9.5)
Singapore	535 (9.8)	554 (11.3)	570 (10.1)	584 (11.5)	552 (6.5)	548 (6.6)
States						
Connecticut	510 (9.8)	534 (10.8)	500 (8.5)	531 (8.9) ▲	532 (7.9)	534 (8.6)
Idaho	509 (9.7)	526 (8.5)	513 (7.2)	530 (8.7)	515 (7.0)	513 (9.9)
Illinois	494 (8.4)	522 (9.1)	503 (8.8)	523 (7.5)	534 (10.7)	531 (7.6)
Indiana †	510 (6.8)	539 (9.2) ▲	516 (8.2)	538 (9.2)	526 (5.6)	529 (7.3)
Maryland	486 (9.6)	510 (6.3)	493 (8.5)	518 (6.6)	526 (6.2)	521 (7.6)
Massachusetts	512 (9.2)	532 (7.4) ▲	512 (9.2)	531 (8.2) ▲	545 (6.4)	540 (5.5)
Michigan	526 (9.1)	548 (8.9)	519 (8.7)	538 (7.6)	539 (7.2)	537 (7.4)
Missouri	504 (9.4)	522 (6.5)	505 (9.4)	524 (7.4)	516 (5.0)	514 (6.3)
North Carolina	489 (9.4)	510 (8.9)	503 (6.5)	508 (11.2)	518 (5.8)	514 (6.4)
Oregon	513 (6.9)	540 (9.0) ▲	511 (8.4)	528 (7.7)	527 (6.1)	523 (8.6)
Pennsylvania	503 (8.4)	530 (10.1) ▲	512 (10.6)	532 (9.5)	536 (6.9)	527 (5.9)
South Carolina	498 (9.9)	507 (9.0)	496 (8.0)	516 (11.9)	521 (9.1)	521 (6.4)
Texas	481 (11.5)	512 (12.7)	491 (10.1)	512 (12.1)	522 (7.1)	507 (9.1)
Districts and Consortia						
Academy School Dist. #20, CO	544 (9.5)	559 (6.1)	533 (10.2)	545 (7.0)	550 (8.9)	531 (5.3)
Chicago Public Schools, IL	423 (11.3)	461 (11.7) ▲	433 (11.5)	453 (10.7)	497 (8.9)	485 (9.4)
Delaware Science Coalition, DE	478 (8.2)	513 (11.3) ▲	484 (9.3)	504 (9.1)	502 (7.4)	500 (9.5)
First in the World Consort., IL	532 (9.2)	564 (8.1)	535 (9.9)	563 (6.2)	585 (10.3)	562 (12.6)
Fremont/Lincoln/WestSide PS, NE	500 (9.3)	524 (9.0)	499 (8.0)	516 (6.7)	513 (8.4)	510 (13.3)
Guilford County, NC [2]	505 (9.6)	534 (9.7) ▲	523 (10.6)	540 (9.6)	531 (8.1)	534 (12.1)
Jersey City Public Schools, NJ	413 (9.8)	444 (10.0)	435 (10.1)	469 (12.6) ▲	494 (10.1)	490 (10.6)
Miami-Dade County PS, FL	422 (11.1)	450 (11.5)	418 (12.6)	433 (13.6)	467 (9.1)	457 (12.2)
Michigan Invitational Group, MI	543 (10.4)	565 (10.2)	536 (8.9)	564 (13.7)	552 (6.3)	538 (6.9)
Montgomery County, MD [2]	513 (6.2)	524 (5.4)	509 (7.4)	525 (7.4)	543 (6.1)	540 (5.9)
Naperville Sch. Dist. #203, IL	553 (6.2)	564 (5.0)	558 (6.9)	575 (11.0)	580 (5.4)	582 (5.4)
Project SMART Consortium, OH	528 (8.5)	539 (12.3)	516 (9.1)	534 (8.9)	535 (8.9)	519 (9.8)
Rochester City Sch. Dist., NY	442 (8.8)	465 (9.8)	427 (12.5)	450 (10.7)	474 (9.5)	478 (11.1)
SW Math/Sci. Collaborative, PA	526 (7.9)	548 (8.8) ▲	517 (9.1)	540 (6.8)	537 (5.8)	544 (7.1)
International Avg. (All Countries)	480 (1.1)	495 (1.1) ▲	481 (1.1)	494 (1.2) ▲	489 (1.0)	486 (1.2)

▲ Significantly higher than other gender

Significance tests adjusted for multiple comparisons

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