# 1

Summary of Gender Differences in Average Mathematics and Science Achievement on TIMSS

Overview

The Third International Mathematics and Science Study (TIMSS) is the largest and most ambitious of the international comparative studies conducted by the International Association for the Evaluation of Educational Achievement (IEA). In 1995, students in 41 countries around the world were tested in both mathematics and science. The TIMSS results have been disseminated to the public in a series of international reports published by the TIMSS International Study at Boston College in the United States and the data made available to researchers via public use data tapes (see Summary of Results for further details).

Since the initial release of the results during 1996 and 1997, there has been considerable analysis and use of the TIMSS data. This report takes a closer look at the results by gender. Chapter 1 begins by summarizing the gender results previously published by the TIMSS International Study Center. Specifically, Chapter 1 presents differences in mean achievement by gender for mathematics and science at the fourth and eighth grades and for students in the final year of secondary school. At the fourth and eighth grades, the results are given for mathematics and science as well as for major content areas within each curriculum area. For the final year of secondary school, results are provided for all students on tests of mathematics and science literacy as well as in advanced mathematics and physics for final-year students who have studied those subjects.
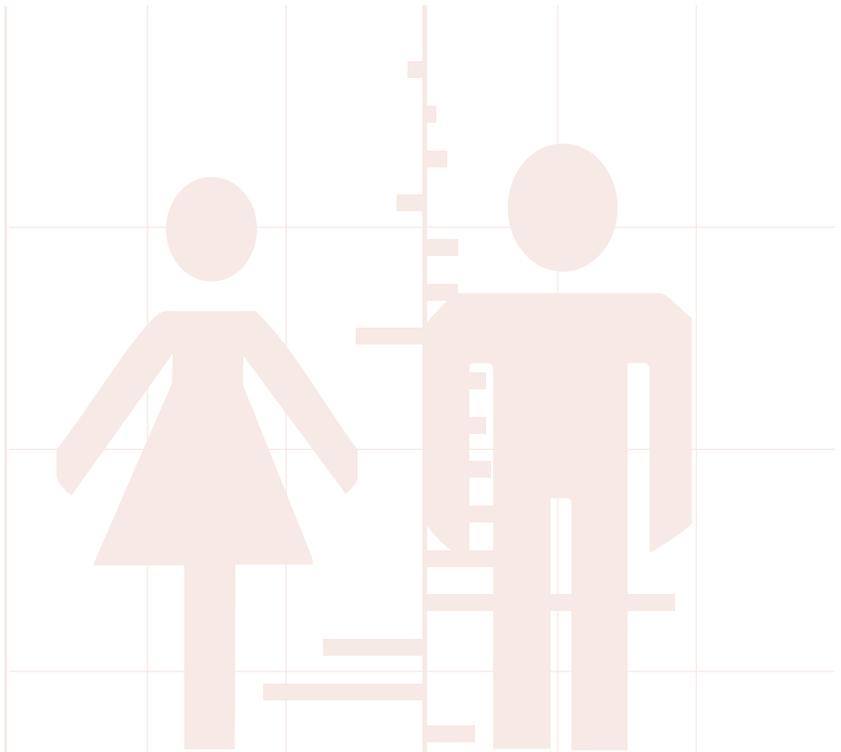
Gender Differences in Mathematics Achievement

Exhibit 1.1 shows the differences in average mathematics achievement by gender at the fourth grade. In the exhibits showing gender differences in overall mean achievement, the countries that met the TIMSS requirement for testing a representative sample of students are shown in the upper part of the tables by increasing order of gender differences in mean achievement. Although all countries tried very hard to meet the TIMSS sampling requirements, several encountered resistance from schools and teachers and did not have participation rates of 85% or higher as specified in the TIMSS guidelines. To provide a better curricular match, four countries (i.e., Colombia, Germany, Romania, and Slovenia) elected to test students somewhat older than those in the other TIMSS countries. Also, several countries encountered various degrees of difficulty in implementing the prescribed methods for sampling classrooms within schools.

In most countries, males and females in the fourth grade had approximately the same average mathematics achievement. The few statistically significant differences that were observed favored males rather than females (see Korea, Japan, and the Netherlands).

Exhibit 1.2 presents the achievement results for fourth-grade males and females by content areas within mathematics. The tables presenting results by content area use an analysis based on the average percent of correct responses to items within each content area, and present the countries in the upper parts of the tables in alphabetical order. Similar to the fourth-grade gender results for mathematics overall, there were few differences in performance between fourth-grade females and males in most of the content areas within mathematics. The exception was the area of measurement, estimation, and number sense where males had significantly higher achievement than females in about one-third of the participating countries.
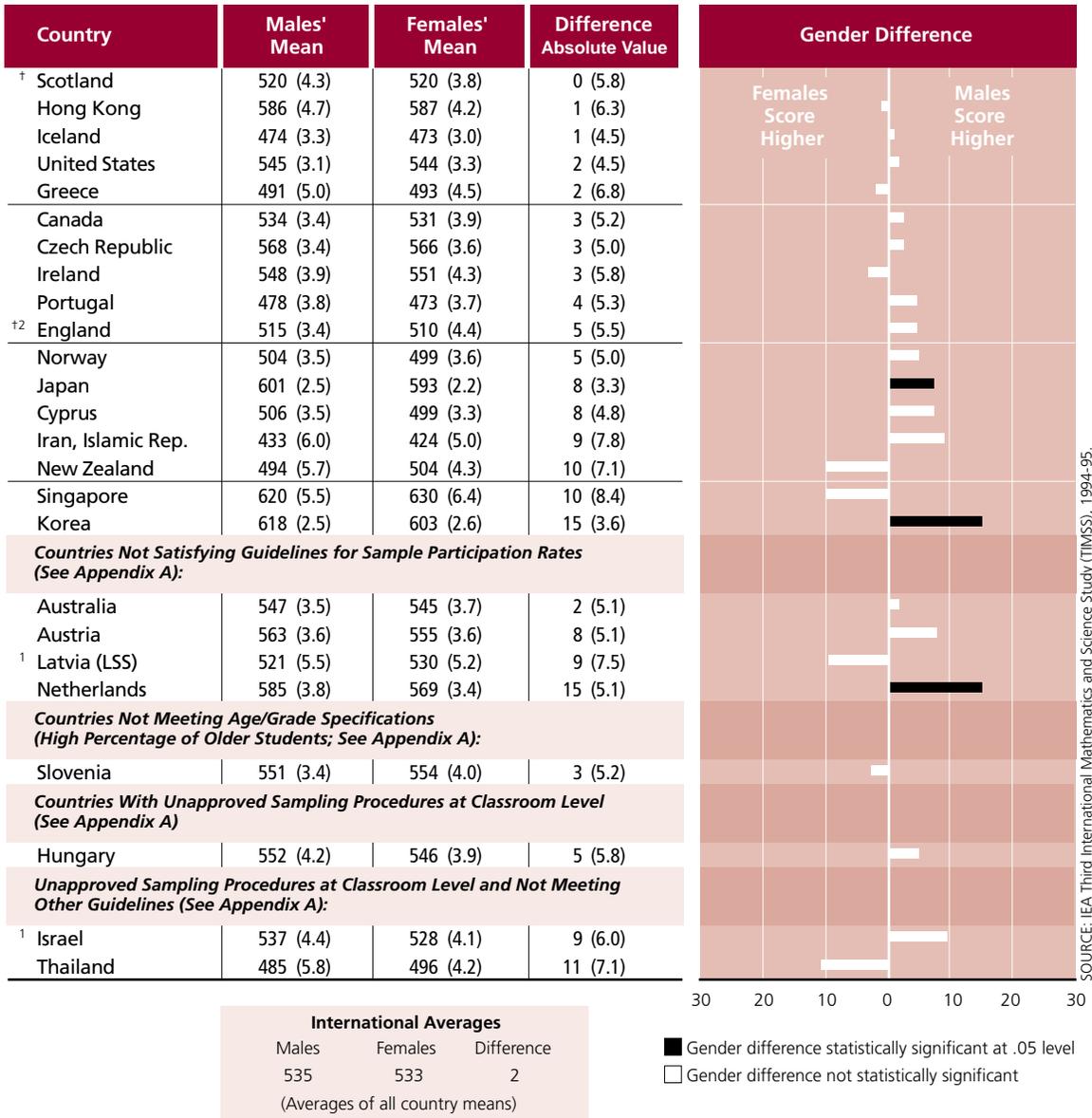
The results in Exhibit 1.3 show that gender differences in average mathematics achievement were also small or negligible for eighth-grade students. Again, however, all of the statistically significant differences favored males rather than females. Males had significantly higher average mathematics achievement than females in Japan, Spain, Portugal, Iran, Korea, Denmark, Greece, and Israel.

Exhibit 1.1

Gender Differences in Mathematics Achievement
Fourth Grade*

Country	Males' Mean	Females' Mean	Difference Absolute Value	Gender Difference
† Scotland	520 (4.3)	520 (3.8)	0 (5.8)	
Hong Kong	586 (4.7)	587 (4.2)	1 (6.3)	
Iceland	474 (3.3)	473 (3.0)	1 (4.5)	
United States	545 (3.1)	544 (3.3)	2 (4.5)	
Greece	491 (5.0)	493 (4.5)	2 (6.8)	
Canada	534 (3.4)	531 (3.9)	3 (5.2)	
Czech Republic	568 (3.4)	566 (3.6)	3 (5.0)	
Ireland	548 (3.9)	551 (4.3)	3 (5.8)	
Portugal	478 (3.8)	473 (3.7)	4 (5.3)	
†2 England	515 (3.4)	510 (4.4)	5 (5.5)	
Norway	504 (3.5)	499 (3.6)	5 (5.0)	
Japan	601 (2.5)	593 (2.2)	8 (3.3)	
Cyprus	506 (3.5)	499 (3.3)	8 (4.8)	
Iran, Islamic Rep.	433 (6.0)	424 (5.0)	9 (7.8)	
New Zealand	494 (5.7)	504 (4.3)	10 (7.1)	
Singapore	620 (5.5)	630 (6.4)	10 (8.4)	
Korea	618 (2.5)	603 (2.6)	15 (3.6)	

Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):

Country	Males' Mean	Females' Mean	Difference Absolute Value	Gender Difference
Australia	547 (3.5)	545 (3.7)	2 (5.1)	
Austria	563 (3.6)	555 (3.6)	8 (5.1)	
1 Latvia (LSS)	521 (5.5)	530 (5.2)	9 (7.5)	
Netherlands	585 (3.8)	569 (3.4)	15 (5.1)	

Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):

Country	Males' Mean	Females' Mean	Difference Absolute Value	Gender Difference
Slovenia	551 (3.4)	554 (4.0)	3 (5.2)	

Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A)

Country	Males' Mean	Females' Mean	Difference Absolute Value	Gender Difference
Hungary	552 (4.2)	546 (3.9)	5 (5.8)	

Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):

Country	Males' Mean	Females' Mean	Difference Absolute Value	Gender Difference
1 Israel	537 (4.4)	528 (4.1)	9 (6.0)	
Thailand	485 (5.8)	496 (4.2)	11 (7.1)	

Females Score Higher — Males Score Higher

30 20 10 0 10 20 30

■ Gender difference statistically significant at .05 level
□ Gender difference not statistically significant

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

International Averages

Males	Females	Difference
535	533	2

(Averages of all country means)

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* Fourth grade in most countries; see Appendix A for information about the grades tested in each country.

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

1 National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.
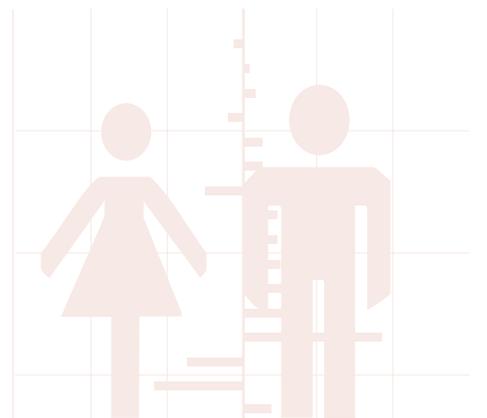
Exhibit 1.2

Average Percent Correct for Males and Females by Mathematics Content Areas
Fourth Grade*

Country	Mathematics Overall		Whole Numbers		Fractions and Proportionality		Measurement, Estimation, and Number Sense	
	Males	Females	Males	Females	Males	Females	Males	Females
Canada	61 (1.1)	60 (1.2)	69 (0.8)	66 (1.3)	47 (1.1)	48 (1.2)	55 (1.1)	53 (1.3)
Cyprus	55 (0.8)	53 (0.7)	66 (0.9)	64 (0.9)	49 (0.9)	47 (0.8)	▲ 49 (1.1)	46 (0.8)
Czech Republic	67 (0.7)	66 (0.7)	75 (0.8)	74 (0.6)	53 (1.0)	52 (0.9)	▲ 69 (0.8)	67 (0.8)
†2 England	57 (0.8)	56 (0.9)	▲ 60 (0.9)	57 (1.0)	46 (1.1)	45 (1.2)	▲ 54 (0.9)	50 (1.0)
Greece	50 (1.2)	51 (0.9)	61 (1.4)	63 (0.9)	42 (1.3)	42 (1.1)	49 (1.2)	48 (1.0)
Hong Kong	73 (1.1)	73 (0.8)	79 (1.1)	79 (0.9)	67 (1.1)	66 (1.0)	69 (1.2)	69 (0.7)
Iceland	50 (1.0)	49 (0.9)	58 (1.2)	55 (1.0)	36 (1.1)	35 (1.1)	44 (1.1)	44 (1.2)
Iran, Islamic Rep.	39 (1.4)	37 (1.1)	52 (1.9)	49 (1.5)	32 (1.3)	32 (1.4)	▲ 38 (1.4)	34 (1.1)
Ireland	63 (0.9)	64 (0.9)	70 (0.9)	70 (1.1)	57 (1.1)	59 (1.2)	57 (1.1)	55 (1.1)
Japan	75 (0.5)	74 (0.5)	▲ 83 (0.5)	81 (0.5)	66 (0.8)	65 (0.6)	▲ 73 (0.6)	71 (0.6)
Korea	▲ 77 (0.4)	75 (0.5)	▲ 89 (0.4)	87 (0.5)	▲ 66 (0.7)	63 (0.7)	▲ 73 (0.7)	70 (0.7)
New Zealand	52 (1.3)	54 (0.9)	57 (1.5)	57 (1.1)	41 (1.5)	42 (1.0)	48 (1.3)	49 (1.2)
Norway	54 (0.9)	53 (0.8)	62 (1.0)	61 (1.1)	39 (1.0)	38 (0.8)	▲ 57 (1.0)	54 (1.1)
Portugal	48 (0.8)	48 (0.8)	57 (1.0)	57 (0.9)	38 (0.9)	38 (0.7)	50 (0.9)	49 (1.0)
† Scotland	58 (0.9)	58 (0.9)	61 (1.0)	61 (1.0)	46 (1.2)	47 (1.2)	54 (1.0)	53 (1.1)
Singapore	75 (0.9)	76 (1.0)	81 (0.8)	▲ 84 (0.8)	73 (1.0)	75 (1.2)	67 (1.0)	66 (1.3)
United States	63 (0.7)	62 (0.7)	71 (0.7)	70 (0.8)	51 (0.9)	50 (0.8)	▲ 54 (0.7)	52 (0.8)
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):								
Australia	63 (0.7)	63 (0.8)	68 (0.9)	67 (0.8)	51 (0.8)	51 (1.0)	60 (0.8)	59 (0.9)
Austria	66 (0.9)	64 (0.8)	74 (0.9)	74 (0.9)	▲ 53 (1.1)	50 (1.0)	71 (1.1)	68 (1.0)
1 Latvia (LSS)	58 (1.2)	60 (1.1)	66 (1.1)	69 (1.1)	43 (1.5)	44 (1.4)	60 (1.3)	61 (1.2)
Netherlands	▲ 71 (0.8)	68 (0.8)	76 (0.9)	74 (1.0)	61 (1.1)	59 (1.0)	▲ 72 (0.8)	68 (1.0)
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):								
Slovenia	64 (0.7)	65 (0.9)	73 (0.7)	75 (0.8)	51 (1.1)	49 (1.2)	65 (1.0)	63 (1.2)
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):								
Hungary	64 (0.8)	64 (0.9)	77 (0.9)	76 (0.9)	50 (1.0)	49 (1.1)	65 (1.0)	63 (1.1)
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):								
1 Israel	60 (1.1)	59 (1.0)	71 (1.1)	71 (1.1)	48 (1.2)	47 (1.2)	▲ 57 (1.4)	52 (1.1)
Thailand	49 (1.3)	52 (1.0)	57 (1.5)	60 (1.4)	42 (1.3)	45 (1.1)	44 (1.3)	43 (1.2)

▲ = Gender difference statistically significant at .05 level, adjusted for multiple comparisons

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Fourth grade in most countries; see Appendix A for information about the grades tested in each country.
† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
1 National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit 1.2

(Continued)

Average Percent Correct for Males and Females by Mathematics Content Areas
Fourth Grade*

Country	Data Representation, Analysis, & Probability		Geometry		Patterns, Relations, and Functions	
	Males	Females	Males	Females	Males	Females
Canada	67 (1.6)	69 (1.4)	72 (1.3)	72 (1.6)	62 (1.6)	60 (2.1)
Cyprus	53 (1.1)	52 (1.1)	52 (1.2)	53 (1.1)	57 (1.2)	54 (1.6)
Czech Republic	67 (1.1)	67 (1.1)	71 (0.9)	71 (0.8)	67 (1.1)	66 (1.1)
[†2] England	64 (1.2)	65 (1.2)	74 (0.9)	74 (1.0)	56 (1.4)	54 (1.2)
Greece	48 (1.6)	51 (1.4)	53 (1.8)	54 (1.1)	46 (1.8)	48 (1.3)
Hong Kong	75 (1.2)	77 (1.0)	75 (0.9)	74 (1.1)	71 (1.5)	75 (1.2)
Iceland	59 (1.7)	58 (1.3)	62 (1.3)	63 (1.2)	49 (1.8)	48 (1.6)
Iran, Islamic Rep.	25 (1.5)	22 (0.8)	42 (1.4)	43 (1.2)	40 (2.0)	40 (1.8)
Ireland	68 (1.2)	70 (1.1)	66 (1.0)	67 (1.0)	64 (1.4)	63 (1.1)
Japan	79 (0.7)	79 (0.7)	73 (0.8)	72 (0.7)	77 (0.7)	76 (0.8)
Korea	80 (0.8)	79 (0.8)	72 (0.8)	71 (0.8)	84 (0.9)	82 (1.1)
New Zealand	58 (1.8)	▲ 64 (1.4)	64 (1.5)	▲ 69 (1.2)	50 (1.5)	▲ 55 (1.4)
Norway	59 (1.2)	60 (1.1)	57 (1.2)	58 (1.1)	49 (1.5)	51 (1.7)
Portugal	43 (1.1)	43 (1.3)	52 (1.2)	52 (1.2)	49 (1.3)	46 (1.4)
[†] Scotland	65 (1.3)	67 (1.2)	72 (1.0)	73 (0.9)	58 (1.4)	57 (1.2)
Singapore	80 (0.9)	82 (1.0)	71 (0.9)	73 (1.0)	76 (1.0)	76 (1.2)
United States	72 (1.1)	74 (1.0)	71 (0.7)	71 (0.9)	67 (1.1)	66 (1.0)
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):						
Australia	66 (1.0)	68 (1.0)	73 (0.8)	75 (1.0)	65 (1.2)	63 (1.2)
Austria	67 (1.5)	66 (1.4)	68 (0.9)	67 (1.0)	65 (1.5)	64 (1.8)
[1] Latvia (LSS)	52 (1.5)	55 (1.6)	65 (1.3)	68 (1.2)	64 (1.7)	67 (1.2)
Netherlands	76 (1.0)	75 (1.3)	▲ 73 (1.0)	69 (0.9)	65 (1.3)	66 (1.5)
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):						
Slovenia	64 (1.1)	64 (1.3)	71 (1.1)	73 (1.0)	67 (1.3)	69 (1.1)
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):						
Hungary	60 (1.3)	61 (1.3)	67 (1.0)	65 (1.2)	68 (1.2)	71 (1.4)
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):						
[1] Israel	65 (1.5)	64 (1.3)	61 (1.3)	63 (1.0)	60 (1.5)	61 (1.8)
Thailand	53 (1.8)	▲ 59 (1.5)	52 (1.6)	54 (1.2)	48 (1.8)	51 (1.2)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

▲ = Gender difference statistically significant at .05 level, adjusted for multiple comparisons

* Fourth grade in most countries; see Appendix A for information about the grades tested in each country.
[†] Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
[1] National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit 1.3

Gender Differences in Mathematics Achievement
Eighth Grade*

Country	Males' Mean	Females' Mean	Difference Absolute Value	Gender Difference
Hungary	537 (3.6)	537 (3.6)	0 (5.1)	
[1] Lithuania	477 (4.0)	478 (4.1)	1 (5.7)	
Russian Federation	535 (6.3)	536 (5.0)	1 (8.0)	
Iceland	488 (5.5)	486 (5.6)	2 (7.8)	
Sweden	520 (3.6)	518 (3.1)	2 (4.7)	
Singapore	642 (6.3)	645 (5.4)	2 (8.3)	
Cyprus	472 (2.8)	475 (2.5)	3 (3.7)	
Canada	526 (3.2)	530 (2.7)	4 (4.2)	
Slovak Republic	549 (3.7)	545 (3.6)	4 (5.2)	
Norway	505 (2.8)	501 (2.7)	4 (3.9)	
[†] Belgium (Fl)	563 (8.8)	567 (7.4)	4 (11.5)	
[†2] England	508 (5.1)	504 (3.5)	4 (6.2)	
[1] Latvia (LSS)	496 (3.8)	491 (3.5)	4 (5.2)	
[†] United States	502 (5.2)	497 (4.5)	5 (6.9)	
[1] Switzerland	548 (3.5)	543 (3.1)	5 (4.7)	
France	542 (3.1)	536 (3.8)	6 (4.9)	
Japan	609 (2.6)	600 (2.1)	9 (3.3)	
New Zealand	512 (5.9)	503 (5.3)	9 (7.9)	
Spain	492 (2.5)	483 (2.6)	10 (3.6)	
Czech Republic	569 (4.5)	558 (6.3)	11 (7.7)	
Portugal	460 (2.8)	449 (2.7)	11 (3.9)	
Iran, Islamic Rep.	434 (2.9)	421 (3.3)	13 (4.4)	
Ireland	535 (7.2)	520 (6.0)	14 (9.3)	
Korea	615 (3.2)	598 (3.4)	17 (4.7)	
Hong Kong	597 (7.7)	577 (7.7)	20 (10.9)	
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):				
Australia	527 (5.1)	532 (4.6)	5 (6.9)	
Austria	544 (3.2)	536 (4.5)	8 (5.6)	
Belgium (Fr)	530 (4.7)	524 (3.7)	6 (6.0)	
Netherlands	545 (7.8)	536 (6.4)	8 (10.1)	
Scotland	506 (6.6)	490 (5.2)	16 (8.4)	
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):				
Colombia	386 (6.9)	384 (3.6)	2 (7.7)	
[†1] Germany	512 (5.1)	509 (5.0)	3 (7.1)	
Romania	483 (4.8)	480 (4.0)	3 (6.2)	
Slovenia	545 (3.8)	537 (3.3)	8 (5.0)	
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):				
Denmark	511 (3.2)	494 (3.4)	17 (4.7)	
Greece	490 (3.7)	478 (3.1)	12 (4.8)	
Thailand	517 (5.6)	526 (7.0)	9 (9.0)	
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):				
[1] Israel	539 (6.6)	509 (6.9)	29 (9.6)	
South Africa	360 (6.3)	349 (4.1)	11 (7.5)	
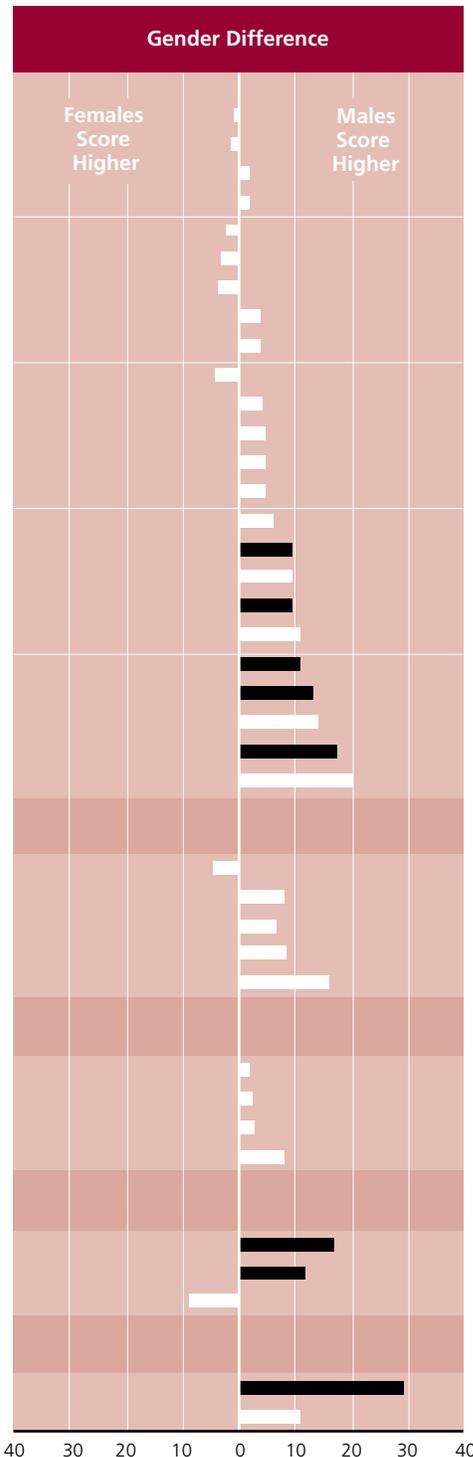
Gender Difference: Females Score Higher — Males Score Higher

Scale: 40 30 20 10 0 10 20 30 40

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

International Averages

	Males	Females	Difference
	519	512	8

(Averages of all country means)

■ Gender difference statistically significant at .05 level
□ Gender difference not statistically significant

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* Eighth grade in most countries; see Appendix A for information about the grades tested in each country.

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

1 National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).

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

As shown in Exhibit 1.4, there were few significant differences by gender at the eighth grade within the content areas. Parallel to the fourth-grade results, across countries the greatest number of differences in average performance by gender were found in measurement where males had higher achievement than did females in a number of countries. The differences were significant in Korea, Portugal, Spain, and Denmark. Interestingly, the pattern for algebra showed females having a slightly higher average than males in a number of countries. The patterns of higher achievement for males in measurement and higher achievement for females in algebra are consistent with findings from the Second International Mathematics Study conducted in 1980-82.[4]

For students in their final year of secondary school (the twelfth grade in many countries), TIMSS had two measures of mathematics achievement. The mathematics literacy test was designed to measure the mathematics achievement of all final-year students, regardless of their mathematics curriculum. The advanced mathematics test was designed to measure learning of advanced mathematics concepts among final-year students who had studied advanced mathematics. As shown in Exhibits 1.5 and 1.6, the results by gender for the secondary students differ from those at the earlier grades. In most of the countries, males had significantly higher average achievement than females in both mathematics literacy and in advanced mathematics.

[4]   Robitaille, D.F. (1989). "Students' Achievements: Population A" in D.F. Robitaille and R.A. Garden (Eds.), *The IEA Study of Mathematics II: Contexts and Outcomes of School Mathematics.* New York: Pergamon Press.

Exhibit 1.4

Average Percent Correct for Males and Females by Mathematics Content Areas
Eighth Grade*

Country	Mathematics Overall		Fractions & Number Sense		Geometry		Algebra	
	Males	Females	Males	Females	Males	Females	Males	Females
† Belgium (Fl)	65 (2.0)	66 (1.9)	71 (1.8)	72 (1.7)	63 (2.1)	64 (2.1)	60 (2.5)	65 (2.4)
Canada	59 (0.7)	59 (0.6)	63 (0.8)	64 (0.7)	58 (0.9)	58 (0.7)	52 (0.9)	55 (1.0)
Cyprus	47 (0.6)	48 (0.6)	50 (0.7)	50 (0.8)	47 (0.9)	48 (0.8)	46 (0.9)	49 (1.0)
Czech Republic	67 (1.0)	64 (1.3)	70 (1.1)	68 (1.3)	68 (1.1)	65 (1.4)	64 (1.4)	66 (1.4)
†2 England	53 (1.3)	53 (0.9)	54 (1.3)	53 (1.0)	54 (1.5)	54 (1.3)	47 (1.6)	51 (1.1)
France	62 (0.8)	61 (0.9)	65 (0.9)	64 (1.0)	67 (1.0)	65 (1.1)	54 (1.1)	54 (1.3)
Hong Kong	72 (1.7)	68 (1.7)	74 (1.7)	70 (1.7)	74 (1.8)	71 (1.9)	71 (1.8)	69 (2.0)
Hungary	61 (0.8)	62 (0.8)	64 (1.0)	65 (0.9)	61 (1.0)	60 (1.0)	61 (1.0)	66 (1.1)
Iceland	49 (1.3)	50 (1.3)	54 (1.8)	55 (1.4)	50 (1.3)	52 (1.6)	39 (1.1)	41 (1.9)
Iran, Islamic Rep.	39 (0.8)	36 (0.8)	40 (0.9)	37 (0.8)	45 (1.1)	40 (1.2)	36 (0.9)	38 (1.2)
Ireland	60 (1.6)	58 (1.4)	65 (1.7)	64 (1.5)	54 (1.7)	49 (1.6)	54 (1.7)	53 (1.7)
Japan	74 (0.5)	73 (0.4)	76 (0.6)	75 (0.5)	79 (0.6)	80 (0.5)	72 (0.7)	72 (0.7)
Korea	▲ 73 (0.6)	70 (0.7)	▲ 76 (0.7)	72 (0.8)	77 (0.8)	73 (0.8)	70 (0.8)	69 (0.9)
1 Latvia (LSS)	52 (1.0)	51 (0.8)	53 (1.2)	53 (1.0)	58 (1.0)	56 (1.1)	50 (1.3)	51 (0.9)
1 Lithuania	48 (1.1)	49 (1.0)	51 (1.2)	52 (1.2)	54 (1.2)	53 (1.2)	45 (1.5)	49 (1.4)
New Zealand	55 (1.4)	53 (1.3)	58 (1.4)	55 (1.3)	54 (1.5)	55 (1.4)	48 (1.5)	49 (1.3)
Norway	54 (0.6)	53 (0.6)	58 (0.7)	58 (0.7)	50 (0.8)	51 (0.9)	44 (0.9)	46 (0.9)
Portugal	44 (0.8)	42 (0.7)	45 (0.9)	42 (0.8)	46 (1.2)	42 (0.9)	39 (1.0)	40 (1.0)
Russian Federation	59 (1.4)	61 (1.3)	61 (1.5)	62 (1.1)	62 (1.7)	64 (1.4)	61 (1.8)	64 (1.3)
Singapore	79 (1.1)	79 (1.0)	83 (1.0)	84 (0.8)	76 (1.3)	77 (1.2)	75 (1.3)	77 (1.3)
Slovak Republic	63 (0.9)	62 (0.8)	66 (1.0)	66 (0.8)	65 (0.9)	62 (1.0)	60 (1.1)	64 (1.0)
Spain	52 (0.7)	50 (0.7)	53 (0.7)	51 (0.7)	51 (0.8)	48 (0.8)	54 (1.0)	54 (0.9)
Sweden	56 (0.8)	56 (0.8)	62 (0.9)	62 (0.9)	48 (0.8)	49 (0.8)	43 (1.0)	45 (1.1)
1 Switzerland	63 (0.8)	61 (0.7)	67 (0.8)	66 (0.9)	60 (1.1)	59 (0.9)	53 (1.1)	53 (0.9)
† United States	53 (1.2)	53 (1.1)	60 (1.3)	59 (1.2)	49 (1.4)	47 (1.1)	50 (1.4)	51 (1.2)
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):								
Australia	57 (1.2)	59 (1.1)	60 (1.2)	61 (1.1)	57 (1.3)	58 (1.2)	53 (1.3)	57 (1.2)
Austria	63 (0.8)	61 (1.2)	67 (0.9)	65 (1.1)	57 (1.3)	57 (1.4)	59 (0.9)	60 (1.2)
Belgium (Fr)	59 (1.1)	58 (1.0)	62 (1.4)	62 (0.9)	60 (1.3)	57 (1.1)	52 (1.6)	55 (1.3)
Netherlands	61 (1.8)	59 (1.6)	63 (1.8)	60 (1.7)	61 (2.1)	58 (1.8)	52 (1.8)	53 (1.8)
Scotland	53 (1.7)	50 (1.3)	55 (1.5)	51 (1.3)	54 (1.8)	50 (1.4)	46 (2.0)	46 (1.4)
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):								
Colombia	30 (1.6)	29 (0.9)	31 (1.8)	30 (0.7)	29 (1.6)	29 (1.1)	28 (1.7)	28 (1.0)
†1 Germany	54 (1.3)	54 (1.2)	60 (1.3)	57 (1.3)	51 (1.5)	53 (1.5)	47 (1.5)	49 (1.4)
Romania	49 (1.1)	49 (1.0)	48 (1.2)	48 (1.0)	53 (1.1)	51 (1.1)	50 (1.5)	54 (1.2)
Slovenia	62 (0.8)	60 (0.7)	64 (0.9)	62 (0.8)	61 (1.1)	59 (1.1)	61 (1.0)	61 (0.9)
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):								
Denmark	▲ 54 (0.8)	50 (0.9)	55 (1.0)	51 (1.1)	56 (1.1)	53 (1.3)	47 (0.8)	44 (1.0)
Greece	51 (0.9)	48 (0.7)	54 (1.0)	51 (0.8)	▲ 53 (0.9)	48 (0.9)	46 (1.0)	46 (0.9)
Thailand	56 (1.4)	58 (1.7)	59 (1.5)	61 (1.8)	60 (1.3)	63 (1.5)	51 (1.8)	55 (2.0)
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):								
1 Israel	61 (1.5)	55 (1.5)	64 (1.6)	58 (1.6)	61 (1.3)	55 (1.8)	63 (1.7)	59 (1.9)
South Africa	25 (1.7)	22 (1.0)	28 (2.0)	24 (1.2)	25 (1.6)	24 (0.9)	24 (1.5)	23 (1.2)

▲ = Gender difference statistically significant at .05 level, adjusted for multiple comparisons

*   Eighth grade in most countries; see Appendix A for information about the grades tested in each country.
†   Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
1   National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).
( ) 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), 1994-95.

Country	Data Representation, Analysis & Probability		Measurement		Proportionality	
	Males	**Females**	**Males**	**Females**	**Males**	**Females**
† Belgium (Fl)	72 (2.2)	73 (1.4)	60 (1.9)	59 (2.0)	52 (2.2)	53 (2.7)
Canada	69 (0.9)	69 (0.6)	52 (0.9)	50 (0.8)	48 (0.9)	48 (1.0)
Cyprus	52 (0.9)	54 (0.9)	44 (1.1)	43 (1.1)	40 (1.0)	39 (0.9)
Czech Republic	70 (0.9)	67 (1.4)	64 (1.2)	60 (1.5)	54 (1.4)	49 (1.7)
†2 England	67 (1.2)	65 (1.1)	51 (1.5)	48 (1.1)	42 (1.5)	40 (1.3)
France	72 (0.8)	70 (1.1)	58 (1.0)	56 (1.1)	50 (1.2)	48 (1.2)
Hong Kong	73 (1.6)	69 (1.4)	68 (1.9)	62 (2.1)	63 (1.5)	60 (1.9)
Hungary	66 (0.9)	65 (0.9)	57 (1.0)	56 (1.0)	47 (1.2)	46 (1.1)
Iceland	63 (1.6)	62 (1.4)	45 (1.8)	45 (2.0)	40 (1.6)	37 (1.4)
Iran, Islamic Rep.	42 (0.8)	40 (0.9)	32 (1.7)	26 (1.4)	38 (1.3)	34 (1.1)
Ireland	70 (1.6)	68 (1.3)	55 (1.9)	51 (1.6)	52 (1.8)	49 (1.2)
Japan	79 (0.5)	77 (0.5)	68 (0.6)	67 (0.6)	62 (0.8)	60 (0.8)
Korea	▲ 80 (0.7)	75 (0.8)	▲ 69 (0.9)	62 (1.0)	62 (0.9)	61 (0.9)
1 Latvia (LSS)	57 (1.0)	55 (1.0)	49 (1.2)	46 (1.1)	41 (1.1)	37 (1.0)
1 Lithuania	52 (1.2)	52 (1.1)	44 (1.1)	41 (1.2)	34 (1.1)	35 (1.2)
New Zealand	67 (1.3)	65 (1.3)	50 (1.5)	46 (1.4)	44 (1.5)	40 (1.4)
Norway	67 (0.8)	66 (0.8)	53 (0.8)	50 (0.7)	41 (0.8)	40 (0.8)
Portugal	55 (0.9)	53 (0.8)	▲ 41 (0.9)	36 (0.8)	33 (1.0)	30 (0.9)
Russian Federation	60 (1.2)	60 (1.4)	56 (1.3)	56 (1.8)	48 (1.6)	49 (1.6)
Singapore	79 (1.1)	79 (1.0)	77 (1.3)	77 (1.0)	75 (1.2)	76 (1.1)
Slovak Republic	62 (0.9)	61 (0.8)	62 (1.1)	59 (1.0)	50 (1.1)	48 (1.3)
Spain	61 (0.8)	59 (0.8)	▲ 47 (1.0)	42 (0.9)	42 (1.1)	38 (0.9)
Sweden	70 (0.9)	69 (0.9)	57 (1.1)	55 (1.0)	46 (1.1)	43 (1.1)
1 Switzerland	73 (1.0)	71 (0.7)	62 (1.0)	59 (1.0)	53 (1.0)	52 (0.9)
† United States	65 (1.1)	66 (1.2)	42 (1.2)	38 (1.2)	43 (1.1)	42 (1.2)
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):						
Australia	66 (1.1)	69 (1.0)	54 (1.2)	53 (1.1)	47 (1.3)	46 (1.1)
Austria	69 (0.9)	68 (1.2)	64 (1.0)	60 (1.6)	50 (1.0)	48 (1.3)
Belgium (Fr)	69 (1.4)	67 (1.1)	56 (1.2)	55 (1.2)	49 (1.1)	46 (1.2)
Netherlands	74 (2.0)	70 (1.5)	58 (1.8)	56 (1.7)	54 (2.4)	49 (1.9)
Scotland	67 (1.6)	63 (1.3)	50 (2.0)	45 (1.4)	43 (1.7)	37 (1.4)
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):						
Colombia	38 (1.9)	36 (1.1)	25 (1.9)	25 (2.5)	24 (1.5)	22 (0.9)
†1 Germany	65 (1.3)	64 (1.3)	52 (1.3)	50 (1.3)	44 (1.6)	41 (1.3)
Romania	49 (1.2)	48 (1.1)	49 (1.4)	47 (1.3)	41 (1.3)	42 (1.3)
Slovenia	67 (0.9)	65 (0.8)	60 (1.1)	57 (1.0)	50 (1.1)	48 (1.2)
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):						
Denmark	69 (1.0)	64 (1.3)	▲ 52 (1.0)	47 (1.2)	43 (1.2)	39 (0.9)
Greece	58 (1.2)	55 (0.8)	45 (1.0)	41 (1.0)	41 (1.3)	38 (1.1)
Thailand	62 (1.3)	63 (1.4)	50 (1.5)	51 (1.8)	50 (1.7)	52 (1.9)
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):						
1 Israel	67 (1.6)	60 (1.6)	52 (1.9)	46 (1.8)	48 (2.0)	40 (1.6)
South Africa	28 (1.9)	25 (1.1)	20 (1.8)	16 (1.0)	23 (1.4)	20 (0.9)

▲ = Gender difference statistically significant at .05 level, adjusted for multiple comparisons

*   Eighth grade in most countries; see Appendix A for information about the grades tested in each country.
†   Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
1   National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).
( ) 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), 1994-95.

Exhibit 1.5

Gender Differences in Mathematics Literacy
Final Year of Secondary School*

Country	Males		Females		Difference	TCI	Gender Difference
	Percent of Students	Mean Achievement	Percent of Students	Mean Achievement			
Hungary	52 (2.5)	485 (4.9)	48 (2.5)	481 (4.8)	5 (6.9)	65%	
2 Cyprus	45 (2.1)	454 (4.9)	55 (2.1)	439 (3.7)	15 (6.1)	48%	
1 Lithuania	35 (3.0)	485 (7.3)	65 (3.0)	461 (7.7)	23 (10.6)	43%	
† New Zealand	49 (1.7)	536 (4.9)	51 (1.7)	507 (6.2)	29 (7.9)	70%	
2 Russian Federation	38 (1.0)	488 (6.5)	62 (1.0)	460 (6.6)	27 (9.2)	48%	
Switzerland	56 (2.5)	555 (6.4)	44 (2.5)	522 (7.4)	33 (9.8)	82%	
Sweden	49 (2.5)	573 (5.9)	51 (2.5)	531 (3.9)	42 (7.0)	71%	
Czech Republic	51 (5.1)	488 (11.3)	49 (5.1)	443 (16.8)	45 (20.2)	78%	
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):							
Australia	42 (2.9)	540 (10.3)	58 (2.9)	510 (9.3)	30 (13.9)	68%	
2 Austria	39 (3.2)	545 (7.2)	61 (3.2)	503 (5.5)	41 (9.0)	76%	
Canada	47 (1.4)	537 (3.8)	53 (1.4)	504 (3.5)	34 (5.2)	70%	
France	47 (3.1)	544 (5.6)	53 (3.1)	506 (5.3)	38 (7.7)	84%	
Iceland	48 (0.8)	558 (3.4)	52 (0.8)	514 (2.2)	44 (4.1)	55%	
1 Italy	46 (3.3)	490 (7.4)	54 (3.3)	464 (6.0)	26 (9.5)	52%	
Norway	51 (2.0)	555 (5.3)	49 (2.0)	501 (4.8)	54 (7.1)	84%	
United States	50 (1.3)	466 (4.1)	50 (1.3)	456 (3.6)	11 (5.5)	63%	
Countries With Unapproved Student Sampling (See Appendix A):							
† Germany	56 (5.2)	509 (8.8)	44 (5.2)	480 (8.8)	29 (12.4)	75%	
Countries With Unapproved Sampling Procedures and Low Participation Rates (See Appendix A):							
Denmark	45 (2.0)	575 (4.0)	55 (2.0)	523 (4.0)	52 (5.7)	58%	
2 Netherlands	52 (2.3)	585 (5.6)	48 (2.3)	533 (5.9)	53 (8.2)	78%	
Slovenia	51 (3.3)	535 (12.7)	49 (3.3)	490 (8.0)	46 (15.0)	88%	
South Africa	49 (1.6)	365 (9.3)	51 (1.6)	348 (10.8)	17 (14.3)	49%	

Females Score Higher — Males Score Higher

120 80 40 0 40 80 120

■ Gender difference statistically significant at .05 level
□ Gender difference not statistically significant

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

International Averages		
Males	Females	Difference
518	485	33
(Averages of all country means)		

* See Appendix A for characteristics of students tested.
† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
1 National Desired Population does not cover all of International Desired Population (see Appendix A).
2 National Defined Population covers less than 90 percent of National Desired Population (see Appendix A).
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Exhibit 1.6

Gender Differences in Advanced Mathematics Achievement
Final Year of Secondary School*

Country	Males		Females		Difference	MTCI	Gender Difference
	Percent of Students	Mean Achievement	Percent of Students	Mean Achievement			
† Greece	69 (2.1)	516 (6.6)	31 (2.1)	505 (10.2)	11 (12.1)	10%	
2 Cyprus	61 (1.6)	524 (4.4)	39 (1.6)	509 (6.4)	15 (7.8)	9%	
Sweden	69 (3.4)	519 (5.9)	31 (3.4)	496 (5.2)	23 (7.9)	16%	
France	63 (2.0)	567 (5.1)	37 (2.0)	543 (5.1)	23 (7.2)	20%	
† Germany	43 (2.4)	484 (6.5)	57 (2.4)	452 (6.6)	32 (9.2)	26%	
Canada	53 (1.6)	528 (6.4)	47 (1.6)	489 (4.4)	39 (7.7)	16%	
1 Lithuania	51 (1.9)	542 (3.7)	49 (1.9)	490 (5.6)	51 (6.7)	3%	
2 Russian Federation	52 (2.4)	568 (9.7)	48 (2.4)	515 (10.2)	53 (14.1)	2%	
Switzerland	54 (2.4)	559 (5.6)	46 (2.4)	503 (5.7)	56 (8.0)	14%	
Czech Republic	41 (2.5)	524 (13.0)	59 (2.5)	432 (8.9)	92 (15.7)	11%	
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix B):							
Australia	55 (5.5)	531 (11.4)	45 (5.5)	517 (15.1)	14 (18.9)	16%	
2 Austria	38 (4.1)	486 (7.3)	62 (4.1)	406 (8.6)	80 (11.2)	33%	
1 Italy	61 (3.8)	484 (10.6)	39 (3.8)	460 (14.1)	24 (17.7)	14%	
United States	51 (2.6)	457 (7.8)	49 (2.6)	426 (7.1)	31 (10.5)	14%	
Countries With Unapproved Sampling Procedures and Low Participation Rates (See Appendix B):							
Denmark	63 (1.8)	529 (4.4)	37 (1.8)	510 (4.6)	19 (6.3)	21%	
Slovenia	50 (4.2)	484 (11.5)	50 (4.2)	464 (11.0)	20 (15.9)	75%	

Females Score Higher — Males Score Higher

120   80   40   0   40   80   120

■ Gender difference statistically significant at .05 level
□ Gender difference not statistically significant

International Averages

Males	Females	Difference
519	482	37

(Averages of all country means)

* See Appendix A for characteristics of students tested.
† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
1 National Desired Population does not cover all of International Desired Population (see Appendix A).
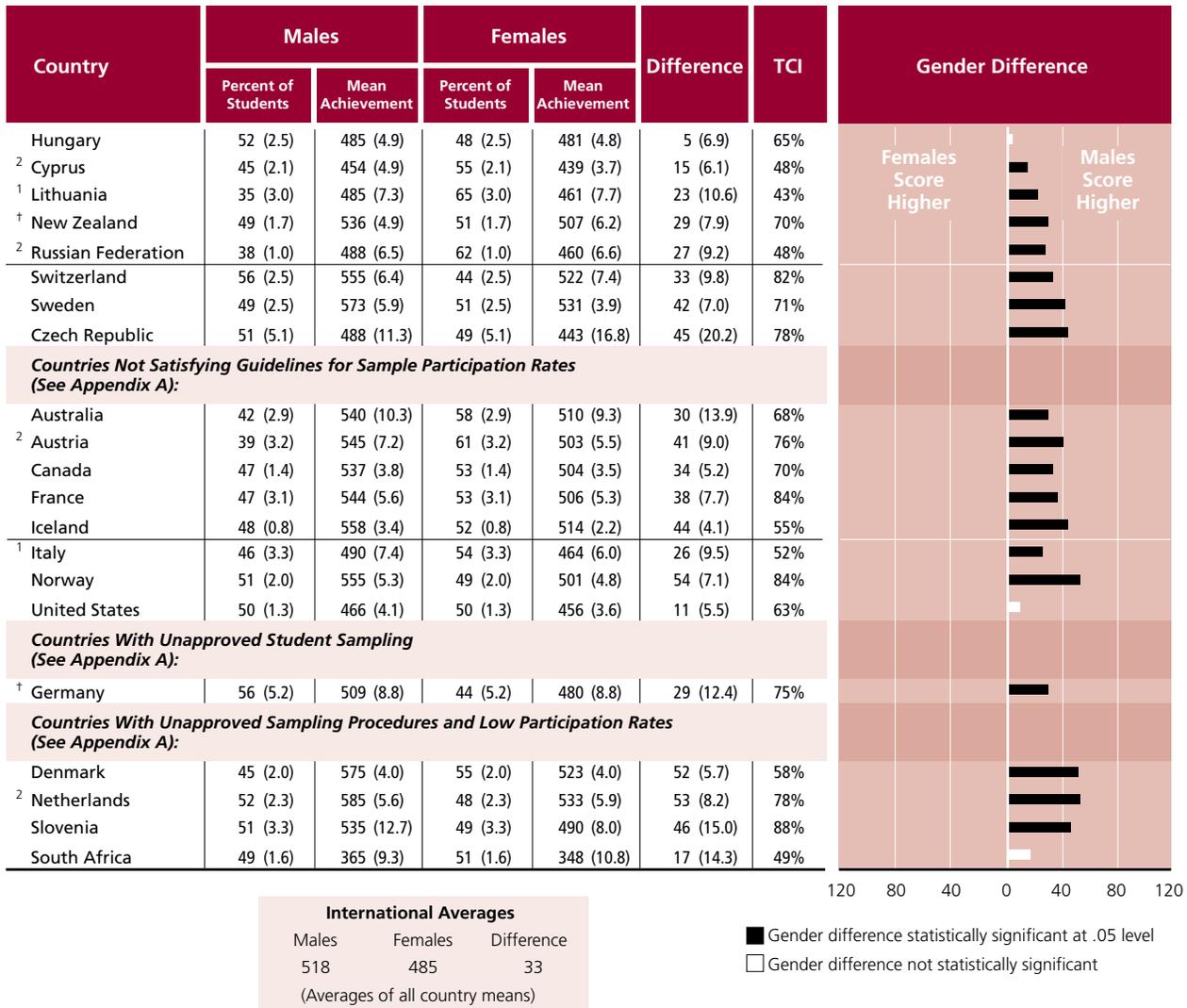2 National Defined Population covers less than 90 percent of National Desired Population (see Appendix A).
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Summary of Gender Differences in Average Mathematics and Science Achievement on TIMSS

Chapter 1

Gender Differences in Science Achievement

The results in Exhibit 1.7 reveal that fourth-grade males had significantly higher science achievement than females in about half of the TIMSS countries. The differences favoring males in science were substantially more pronounced than in the TIMSS mathematics results for the fourth grade. Statistically significant differences favoring males were found in eleven countries, and ranged from 12 points in the United States to 26 points in the Netherlands. As shown in Exhibit 1.8, the content area results revealed few significant gender differences across countries in life science or environmental issues and the nature of science, but many significant differences favoring males in earth science, and to a lesser extent in physical science.

At the eighth grade, males had significantly higher average science achievement than females in many countries, with males scoring 20 or more points higher than females in 12 countries (see Exhibit 1.9). As shown in Exhibit 1.10, the gender differences in average science achievement vary depending upon the science subject or content area. The gender differences in earth science, physics, and chemistry reflected advantages for males. Females and males had similar achievement on items covering life science and environmental issues and the nature of science.

At the final year of secondary school, the male advantage in science achievement was pervasive in the TIMSS data. As shown in Exhibit 1.11, all countries except South Africa showed statistically significant gender differences in science literacy favoring males. The results presented in Exhibit 1.12 show that males had significantly higher physics achievement than females in all countries except Latvia.
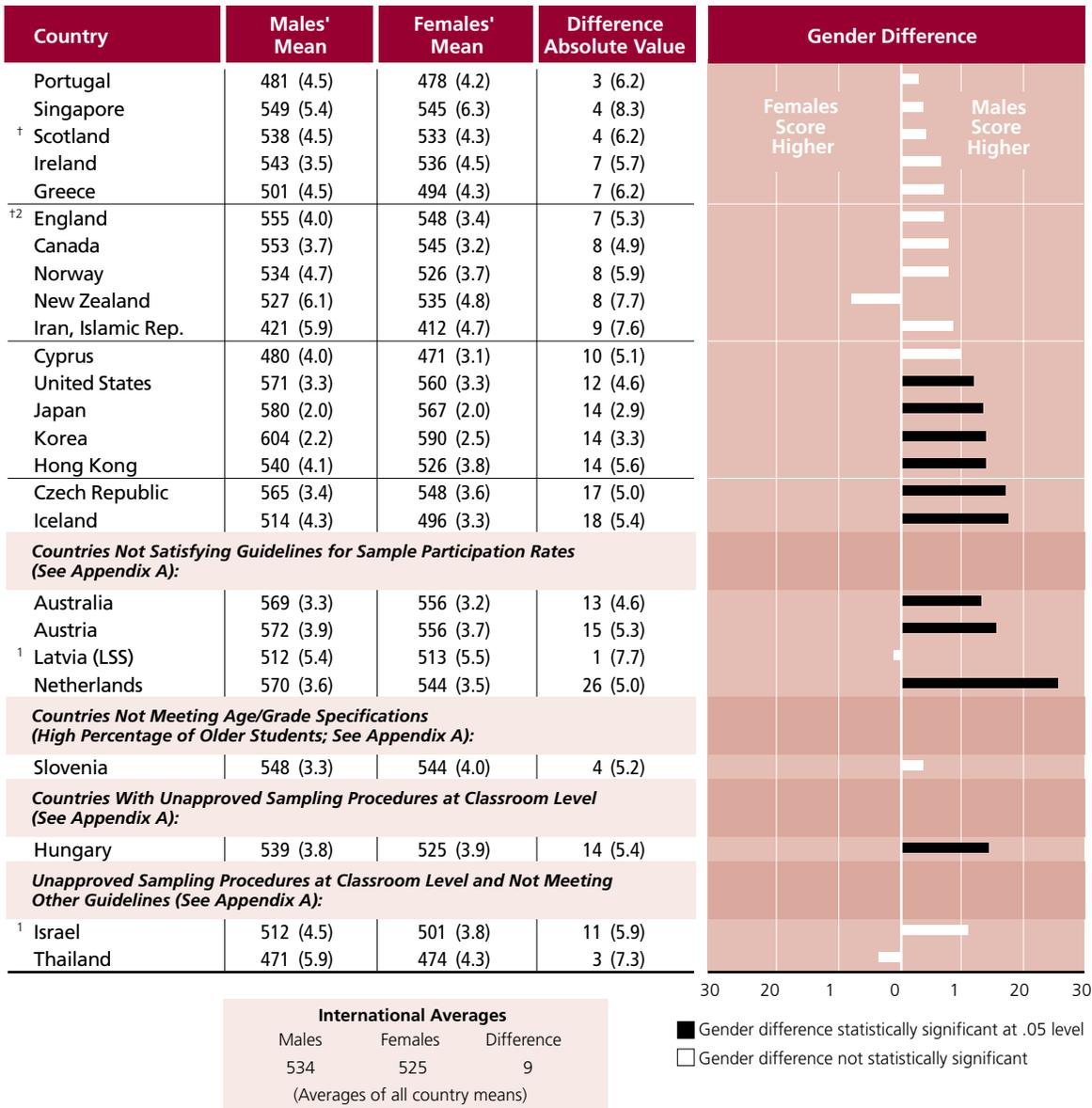
Exhibit 1.7

Exhibit 1.8

Exhibit 1.9

Exhibit 1.10

Exhibit 1.11

Exhibit 1.12

Exhibit 1.7

Gender Differences in Science Achievement
Fourth Grade*

Country	Males' Mean	Females' Mean	Difference Absolute Value	Gender Difference
Portugal	481 (4.5)	478 (4.2)	3 (6.2)	
Singapore	549 (5.4)	545 (6.3)	4 (8.3)	
† Scotland	538 (4.5)	533 (4.3)	4 (6.2)	
Ireland	543 (3.5)	536 (4.5)	7 (5.7)	
Greece	501 (4.5)	494 (4.3)	7 (6.2)	
†2 England	555 (4.0)	548 (3.4)	7 (5.3)	
Canada	553 (3.7)	545 (3.2)	8 (4.9)	
Norway	534 (4.7)	526 (3.7)	8 (5.9)	
New Zealand	527 (6.1)	535 (4.8)	8 (7.7)	
Iran, Islamic Rep.	421 (5.9)	412 (4.7)	9 (7.6)	
Cyprus	480 (4.0)	471 (3.1)	10 (5.1)	
United States	571 (3.3)	560 (3.3)	12 (4.6)	
Japan	580 (2.0)	567 (2.0)	14 (2.9)	
Korea	604 (2.2)	590 (2.5)	14 (3.3)	
Hong Kong	540 (4.1)	526 (3.8)	14 (5.6)	
Czech Republic	565 (3.4)	548 (3.6)	17 (5.0)	
Iceland	514 (4.3)	496 (3.3)	18 (5.4)	
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):				
Australia	569 (3.3)	556 (3.2)	13 (4.6)	
Austria	572 (3.9)	556 (3.7)	15 (5.3)	
1 Latvia (LSS)	512 (5.4)	513 (5.5)	1 (7.7)	
Netherlands	570 (3.6)	544 (3.5)	26 (5.0)	
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):				
Slovenia	548 (3.3)	544 (4.0)	4 (5.2)	
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):				
Hungary	539 (3.8)	525 (3.9)	14 (5.4)	
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):				
1 Israel	512 (4.5)	501 (3.8)	11 (5.9)	
Thailand	471 (5.9)	474 (4.3)	3 (7.3)	

Females Score Higher   **Males Score Higher**

30 20 1 0 1 20 30

■ Gender difference statistically significant at .05 level
□ Gender difference not statistically significant

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

International Averages

Males	Females	Difference
534	525	9

(Averages of all country means)

* Fourth grade in most countries; see Apendix A for information about the grades tested in each country.

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

1 National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.
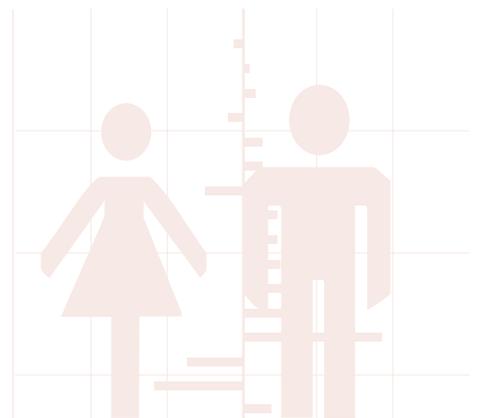
Exhibit 1.8

Average Percent Correct for Males and Females by Science Content Areas
Fourth Grade*

Country	Science Overall		Earth Science		Life Science	
	Males	**Females**	**Males**	**Females**	**Males**	**Females**
Canada	64 (0.7)	63 (0.6)	▲ 63 (0.9)	60 (0.7)	68 (0.7)	69 (0.8)
Cyprus	51 (0.7)	50 (0.6)	▲ 49 (0.9)	46 (0.7)	55 (0.7)	54 (0.7)
Czech Republic	▲ 67 (0.6)	64 (0.7)	▲ 67 (0.8)	61 (0.8)	72 (0.6)	71 (0.7)
[†2] England	64 (0.8)	63 (0.6)	▲ 63 (0.8)	60 (0.8)	68 (0.7)	68 (0.6)
Greece	54 (1.0)	53 (1.0)	52 (1.2)	52 (0.9)	61 (0.9)	61 (1.1)
Hong Kong	▲ 63 (0.8)	61 (0.7)	▲ 63 (0.7)	59 (0.6)	69 (0.8)	67 (0.7)
Iceland	▲ 56 (0.8)	54 (0.8)	▲ 57 (1.3)	52 (0.8)	60 (0.9)	60 (1.0)
Iran, Islamic Rep.	41 (1.0)	39 (0.9)	▲ 40 (1.0)	35 (0.7)	44 (1.2)	44 (0.9)
Ireland	61 (0.7)	61 (0.8)	▲ 62 (0.9)	59 (1.1)	65 (0.7)	66 (0.9)
Japan	▲ 70 (0.4)	69 (0.4)	▲ 68 (0.5)	65 (0.6)	73 (0.5)	73 (0.4)
Korea	▲ 75 (0.5)	73 (0.5)	▲ 73 (0.6)	70 (0.7)	76 (0.5)	75 (0.6)
New Zealand	59 (1.2)	61 (0.9)	58 (1.2)	57 (1.0)	64 (1.2)	▲ 68 (0.9)
Norway	61 (0.8)	60 (0.7)	▲ 61 (1.0)	58 (0.8)	66 (0.9)	67 (0.8)
Portugal	50 (0.9)	50 (0.8)	50 (1.0)	49 (0.8)	53 (0.9)	54 (0.9)
[†] Scotland	61 (0.9)	60 (0.8)	▲ 60 (0.9)	56 (0.9)	65 (0.9)	66 (0.9)
Singapore	65 (0.9)	64 (1.0)	59 (0.9)	57 (1.0)	70 (0.9)	69 (1.0)
United States	▲ 67 (0.6)	65 (0.6)	▲ 65 (0.7)	62 (0.9)	72 (0.7)	71 (0.6)
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):						
Australia	▲ 67 (0.6)	65 (0.6)	▲ 64 (0.7)	59 (0.7)	72 (0.6)	72 (0.5)
Austria	▲ 67 (0.9)	64 (0.7)	▲ 64 (0.9)	60 (1.0)	72 (0.9)	72 (0.8)
[1] Latvia (LSS)	55 (0.9)	57 (1.0)	56 (1.1)	57 (1.2)	59 (0.9)	61 (1.2)
Netherlands	▲ 70 (0.7)	65 (0.7)	▲ 65 (0.8)	58 (0.8)	▲ 75 (0.7)	71 (0.7)
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):						
Slovenia	64 (0.7)	63 (0.8)	65 (0.7)	63 (0.9)	68 (0.9)	68 (0.8)
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):						
Hungary	▲ 63 (0.8)	60 (0.7)	▲ 64 (0.9)	60 (0.8)	67 (0.8)	66 (0.8)
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):						
[1] Israel	58 (1.1)	57 (0.8)	53 (1.2)	50 (1.0)	62 (1.3)	61 (0.9)
Thailand	49 (1.2)	49 (0.8)	48 (1.2)	47 (0.9)	52 (1.0)	53 (0.8)

▲ = Gender difference statistically significant at .05 level, adjusted for multiple comparisons

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Fourth grade in most countries; see Appendix A for information about the grades tested in each country.
† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
1 National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit 1.8

(Continued)

Average Percent Correct for Males and Females by Science Content Areas
Fourth Grade*

Country	Physical Science		Environmental Issues and the Nature of Science	
	Males	**Females**	**Males**	**Females**
Canada	63 (0.9)	59 (0.8)	55 (1.1)	57 (0.7)
Cyprus	51 (0.8)	49 (0.8)	42 (1.2)	42 (1.1)
Czech Republic	▲ 65 (0.8)	59 (0.8)	56 (1.2)	56 (1.2)
[†2] England	62 (1.0)	59 (0.8)	55 (1.2)	58 (1.2)
Greece	51 (1.1)	47 (1.1)	43 (1.7)	43 (1.5)
Hong Kong	▲ 62 (1.0)	58 (0.9)	51 (1.3)	49 (1.2)
Iceland	▲ 54 (1.0)	49 (0.8)	48 (1.9)	46 (1.4)
Iran, Islamic Rep.	41 (1.2)	39 (1.1)	25 (1.2)	26 (1.3)
Ireland	58 (0.9)	56 (0.8)	55 (1.0)	55 (1.3)
Japan	▲ 71 (0.5)	69 (0.6)	62 (0.8)	63 (0.7)
Korea	▲ 76 (0.7)	73 (0.5)	69 (1.1)	71 (1.0)
New Zealand	57 (1.5)	56 (1.1)	51 (1.7)	▲ 57 (1.3)
Norway	57 (1.0)	53 (0.9)	53 (1.3)	52 (1.1)
Portugal	50 (1.1)	48 (1.0)	39 (1.3)	40 (1.2)
[†] Scotland	59 (1.0)	56 (0.9)	52 (1.5)	55 (1.2)
Singapore	65 (1.0)	63 (1.0)	53 (1.4)	54 (1.4)
United States	▲ 62 (0.7)	59 (0.7)	64 (0.9)	66 (0.9)
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):				
Australia	▲ 64 (0.9)	61 (0.7)	63 (1.0)	63 (1.0)
Austria	▲ 67 (1.1)	60 (0.8)	▲ 56 (1.3)	51 (1.0)
[1] Latvia (LSS)	55 (1.1)	54 (1.0)	45 (1.5)	47 (1.2)
Netherlands	▲ 68 (1.0)	61 (0.8)	61 (1.1)	61 (1.3)
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):				
Slovenia	63 (0.9)	59 (0.9)	53 (1.2)	▲ 56 (1.1)
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):				
Hungary	▲ 62 (1.0)	57 (1.0)	49 (1.2)	51 (1.1)
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):				
[1] Israel	56 (1.2)	55 (0.9)	52 (1.6)	52 (1.4)
Thailand	47 (1.4)	46 (1.0)	47 (1.8)	49 (1.4)

▲ = Gender difference statistically significant at .05 level, adjusted for multiple comparisons

*   Fourth grade in most countries; see Appendix A for information about the grades tested in each country.
[†]   Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
[1]   National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit 1.9

Gender Differences in Science Achievement
Eighth Grade*

Country	Males' Mean	Females' Mean	Difference Absolute Value	Gender Difference
Cyprus	461 (2.2)	465 (2.7)	4 (3.0)	
[†] United States	539 (4.9)	530 (5.2)	9 (3.6)	
Singapore	612 (6.7)	603 (7.0)	9 (8.1)	
Russian Federation	544 (4.9)	533 (3.7)	11 (3.4)	
Ireland	544 (6.6)	532 (5.2)	12 (7.6)	
Canada	537 (3.1)	525 (3.7)	12 (4.3)	
Norway	534 (3.2)	520 (2.0)	14 (3.7)	
[1] Lithuania	484 (3.8)	470 (4.0)	14 (3.9)	
Sweden	543 (3.4)	528 (3.4)	15 (3.4)	
[1] Latvia (LSS)	492 (3.3)	478 (3.2)	15 (3.5)	
[†] Belgium (Fl)	558 (6.0)	543 (5.8)	15 (8.7)	
[1] Switzerland	529 (3.2)	514 (3.0)	15 (3.7)	
Slovak Republic	552 (3.5)	537 (3.9)	15 (3.6)	
Iceland	501 (5.1)	486 (4.6)	16 (5.2)	
France	506 (2.7)	490 (3.3)	16 (3.1)	
Japan	579 (2.4)	562 (2.0)	17 (3.0)	
Iran, Islamic Rep.	477 (3.8)	461 (3.2)	17 (5.2)	
Spain	526 (2.1)	508 (2.3)	18 (2.9)	
Hungary	563 (3.1)	545 (3.4)	18 (3.6)	
[†2] England	562 (5.6)	542 (4.2)	20 (7.7)	
Portugal	490 (2.8)	468 (2.7)	22 (2.8)	
Czech Republic	586 (4.2)	562 (5.8)	24 (4.5)	
Korea	576 (2.7)	551 (2.3)	24 (3.8)	
New Zealand	538 (5.4)	512 (5.2)	25 (6.2)	
Hong Kong	535 (5.5)	507 (5.1)	27 (5.8)	
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):				
Australia	550 (5.2)	540 (4.1)	10 (5.3)	
Austria	566 (4.0)	549 (4.6)	18 (4.3)	
Belgium (Fr)	479 (4.8)	463 (2.9)	16 (5.5)	
Netherlands	570 (6.4)	550 (4.9)	20 (5.1)	
Scotland	527 (6.4)	507 (4.7)	20 (5.1)	
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):				
Colombia	418 (7.3)	405 (4.6)	13 (8.4)	
[†1] Germany	542 (5.9)	524 (4.9)	18 (4.8)	
Romania	492 (5.3)	480 (5.0)	12 (3.8)	
Slovenia	573 (3.2)	548 (3.2)	25 (4.1)	
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):				
Denmark	494 (3.6)	463 (3.9)	31 (4.5)	
Greece	505 (2.6)	489 (3.1)	16 (3.3)	
Thailand	524 (3.9)	526 (4.3)	2 (3.6)	
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):				
[1] Israel	545 (6.4)	512 (6.1)	33 (7.1)	
South Africa	337 (9.5)	315 (6.0)	21 (8.6)	

Gender Difference — Females Score Higher / Males Score Higher

Scale: 33 22 11 0 11 22 33

■ Gender difference statistically significant at .05 level
□ Gender difference not statistically significant

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

International Averages

Males	Females	Difference
525	509	17

(Averages of all country means)

* Eighth grade in most countries; see Appendix A for information about the grades tested in each country.

[†] Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
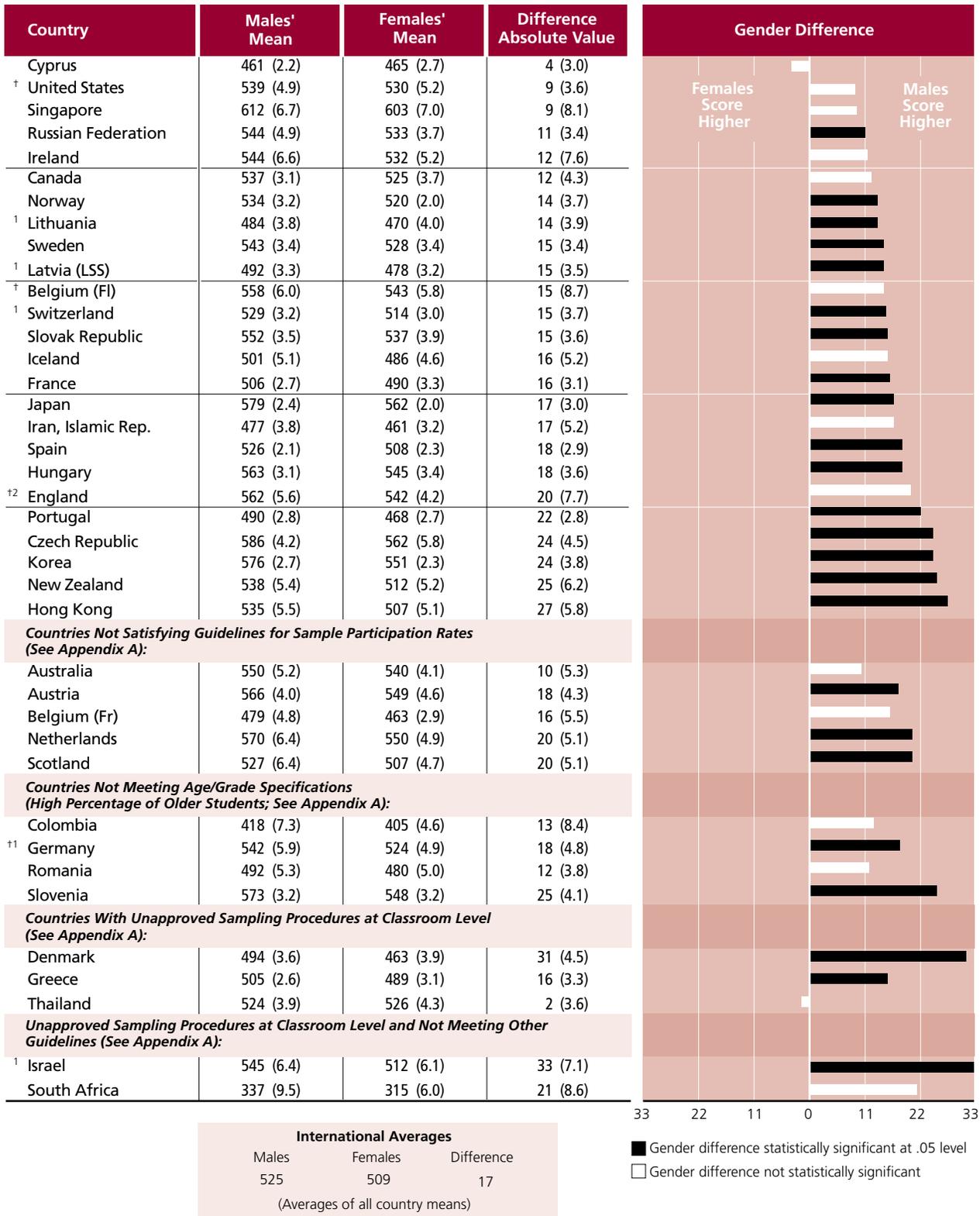
[1] National Desired Population does not cover all of International Desired Population (see Appendix A). Because coverage falls below 65%, Latvia is annotated LSS for Latvian Speaking Schools only.

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

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
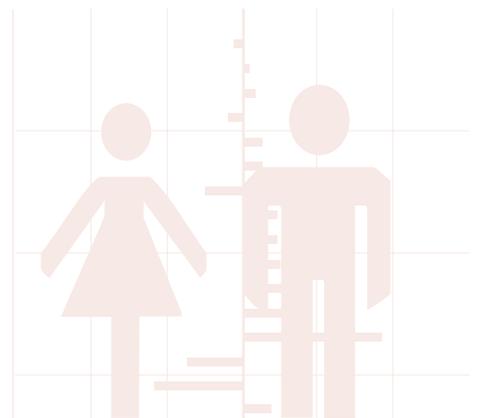
Exhibit 1.10

Average Percent Correct for Males and Females by Science Content Areas
Eighth Grade*

Country	Science Overall		Earth Science		Life Science	
	Males	**Females**	**Males**	**Females**	**Males**	**Females**
† Belgium (Fl)	62 (1.7)	59 (1.5)	64 (2.0)	60 (1.5)	64 (1.7)	64 (1.5)
Canada	60 (0.6)	58 (0.6)	59 (0.8)	56 (0.8)	62 (0.8)	63 (0.8)
Cyprus	46 (0.4)	47 (0.6)	47 (0.7)	46 (0.9)	47 (0.6)	▲ 51 (0.7)
Czech Republic	▲ 67 (0.8)	61 (1.1)	66 (1.1)	60 (1.6)	70 (0.9)	67 (1.2)
†2 England	63 (1.0)	60 (0.7)	61 (1.2)	58 (0.9)	65 (1.2)	63 (1.1)
France	▲ 55 (0.7)	52 (0.7)	57 (0.9)	53 (1.0)	57 (0.8)	55 (0.9)
Hong Kong	▲ 60 (1.1)	55 (1.1)	▲ 57 (1.2)	51 (1.1)	63 (1.2)	59 (1.2)
Hungary	▲ 63 (0.7)	59 (0.7)	▲ 62 (1.0)	57 (0.9)	66 (0.8)	65 (0.8)
Iceland	53 (1.2)	51 (0.9)	52 (1.5)	48 (1.3)	58 (1.2)	58 (1.2)
Iran, Islamic Rep.	▲ 49 (0.8)	45 (0.8)	▲ 47 (0.8)	42 (0.9)	50 (0.9)	47 (0.9)
Ireland	60 (1.3)	57 (1.0)	64 (1.4)	59 (1.2)	60 (1.4)	60 (1.3)
Japan	▲ 67 (0.5)	64 (0.4)	▲ 64 (0.5)	58 (0.6)	71 (0.5)	70 (0.5)
Korea	▲ 67 (0.5)	64 (0.5)	▲ 65 (0.7)	60 (0.7)	71 (0.7)	69 (0.7)
1 Latvia (LSS)	▲ 52 (0.8)	48 (0.6)	▲ 51 (1.1)	45 (1.0)	54 (0.9)	52 (0.8)
1 Lithuania	▲ 51 (0.8)	47 (0.8)	▲ 49 (1.1)	44 (1.1)	52 (1.0)	52 (1.0)
New Zealand	60 (1.0)	56 (1.0)	▲ 59 (1.1)	52 (1.1)	61 (1.2)	60 (1.1)
Norway	59 (0.6)	56 (0.4)	▲ 64 (0.8)	59 (0.7)	60 (0.8)	62 (0.6)
Portugal	▲ 52 (0.7)	48 (0.6)	▲ 53 (1.0)	47 (0.8)	55 (0.8)	52 (0.8)
Russian Federation	60 (0.9)	57 (0.7)	61 (0.9)	57 (0.9)	62 (0.9)	63 (0.7)
Singapore	71 (1.2)	69 (1.1)	66 (1.4)	63 (1.3)	72 (1.2)	71 (1.2)
Slovak Republic	▲ 62 (0.6)	57 (0.7)	▲ 62 (0.9)	58 (0.9)	61 (0.7)	59 (0.8)
Spain	▲ 58 (0.5)	54 (0.5)	▲ 59 (0.7)	54 (0.7)	▲ 60 (0.7)	57 (0.6)
Sweden	▲ 60 (0.6)	57 (0.6)	63 (0.8)	60 (0.8)	63 (0.7)	63 (0.8)
1 Switzerland	▲ 58 (0.6)	54 (0.5)	60 (0.9)	56 (0.7)	59 (0.8)	59 (0.7)
† United States	59 (1.0)	57 (1.0)	60 (1.0)	56 (1.1)	63 (1.2)	63 (1.1)
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):						
Australia	61 (1.0)	59 (0.8)	59 (1.0)	55 (0.9)	62 (1.0)	64 (0.8)
Austria	63 (0.8)	60 (0.8)	▲ 65 (0.9)	59 (1.0)	65 (0.8)	64 (0.9)
Belgium (Fr)	52 (1.0)	49 (0.7)	52 (1.3)	48 (0.9)	55 (1.1)	55 (1.0)
Netherlands	64 (1.2)	60 (1.1)	64 (1.6)	58 (1.4)	67 (1.4)	66 (1.6)
Scotland	57 (1.2)	53 (0.9)	▲ 56 (1.2)	48 (1.0)	58 (1.3)	55 (1.1)
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):						
Colombia	40 (1.4)	37 (0.8)	39 (1.4)	35 (1.1)	45 (1.6)	42 (1.0)
†1 Germany	59 (1.2)	57 (1.0)	58 (1.1)	56 (1.3)	63 (1.3)	63 (1.1)
Romania	51 (0.9)	49 (0.9)	50 (1.1)	48 (1.1)	55 (1.1)	55 (1.1)
Slovenia	▲ 64 (0.6)	59 (0.7)	▲ 67 (0.8)	62 (0.9)	66 (0.7)	63 (0.8)
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):						
Denmark	▲ 54 (0.6)	48 (0.8)	▲ 53 (0.9)	44 (0.9)	57 (0.9)	55 (1.0)
Greece	▲ 54 (0.6)	50 (0.6)	▲ 51 (0.8)	46 (0.7)	55 (0.7)	53 (0.7)
Thailand	57 (0.9)	58 (1.0)	56 (1.2)	56 (1.1)	65 (1.0)	67 (1.1)
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):						
1 Israel	▲ 61 (1.2)	54 (1.1)	▲ 59 (1.4)	52 (1.3)	63 (1.5)	59 (1.4)
South Africa	28 (1.8)	25 (1.2)	28 (1.6)	24 (1.0)	29 (1.9)	25 (1.3)

▲ = Gender difference statistically significant at .05 level, adjusted for multiple comparisons

* Eighth grade in most countries; see Appendix A for information about the grades tested in each country.

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

1 National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).

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

Country	Physics		Chemistry		Environmental Issues and the Nature of Science	
	Males	Females	Males	Females	Males	Females
† Belgium (Fl)	63 (1.7)	58 (1.4)	53 (1.6)	50 (1.8)	59 (1.6)	57 (2.3)
Canada	▲ 61 (0.6)	57 (0.5)	53 (0.9)	50 (0.9)	62 (0.8)	60 (1.0)
Cyprus	47 (0.6)	45 (0.7)	45 (0.9)	44 (0.8)	45 (1.0)	47 (0.9)
Czech Republic	▲ 67 (0.8)	60 (0.9)	▲ 64 (1.2)	56 (1.7)	▲ 64 (1.2)	55 (1.6)
†2 England	63 (1.0)	60 (0.8)	57 (1.2)	53 (1.4)	65 (1.6)	64 (1.2)
France	▲ 57 (0.7)	52 (0.7)	49 (1.2)	45 (1.2)	54 (1.3)	53 (1.1)
Hong Kong	▲ 62 (0.9)	54 (1.1)	▲ 57 (1.3)	52 (1.2)	57 (1.6)	53 (1.5)
Hungary	▲ 63 (0.7)	56 (0.8)	▲ 62 (0.9)	58 (1.0)	55 (1.2)	52 (1.1)
Iceland	54 (1.6)	52 (0.9)	43 (1.1)	41 (1.4)	49 (1.8)	48 (1.2)
Iran, Islamic Rep.	▲ 51 (1.0)	44 (0.8)	53 (1.0)	51 (1.1)	40 (1.4)	37 (1.5)
Ireland	▲ 59 (1.3)	54 (1.0)	56 (1.5)	52 (1.2)	60 (1.6)	60 (1.3)
Japan	▲ 68 (0.5)	65 (0.4)	▲ 62 (0.7)	59 (0.6)	61 (0.9)	58 (0.8)
Korea	▲ 67 (0.7)	62 (0.6)	65 (0.8)	61 (0.9)	▲ 66 (1.0)	61 (1.1)
1 Latvia (LSS)	▲ 55 (1.0)	48 (0.7)	50 (1.2)	46 (1.1)	48 (1.3)	46 (1.2)
1 Lithuania	▲ 56 (0.9)	48 (0.7)	50 (1.1)	45 (1.1)	41 (1.4)	38 (1.2)
New Zealand	▲ 60 (0.8)	55 (0.8)	▲ 56 (1.3)	50 (1.4)	60 (1.5)	58 (1.3)
Norway	▲ 59 (0.6)	55 (0.5)	▲ 52 (0.9)	47 (0.8)	56 (1.0)	55 (1.1)
Portugal	▲ 52 (0.6)	45 (0.6)	▲ 54 (1.1)	46 (1.0)	45 (1.1)	45 (1.1)
Russian Federation	▲ 60 (1.0)	55 (0.9)	60 (1.6)	55 (1.2)	49 (1.1)	50 (1.0)
Singapore	71 (1.0)	67 (1.0)	70 (1.6)	68 (1.5)	74 (1.3)	74 (1.4)
Slovak Republic	▲ 65 (0.7)	58 (0.8)	▲ 61 (1.0)	54 (1.0)	55 (1.1)	52 (1.1)
Spain	▲ 58 (0.5)	52 (0.6)	▲ 54 (0.9)	49 (0.8)	53 (0.8)	53 (1.0)
Sweden	▲ 60 (0.6)	54 (0.7)	▲ 59 (1.0)	52 (0.7)	53 (1.0)	51 (0.9)
1 Switzerland	▲ 60 (0.7)	55 (0.6)	▲ 53 (0.9)	46 (0.9)	53 (1.0)	49 (1.0)
† United States	57 (0.9)	54 (0.9)	55 (1.3)	51 (1.2)	59 (1.2)	62 (1.2)
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):						
Australia	62 (0.9)	58 (0.8)	56 (1.2)	52 (1.0)	62 (1.3)	63 (1.1)
Austria	▲ 64 (0.8)	59 (0.9)	61 (1.3)	56 (1.5)	56 (1.1)	54 (1.3)
Belgium (Fr)	53 (1.1)	50 (0.6)	44 (1.1)	39 (1.1)	47 (1.6)	46 (1.1)
Netherlands	▲ 65 (1.2)	60 (1.0)	▲ 56 (1.0)	49 (1.1)	66 (2.1)	65 (1.9)
Scotland	59 (1.0)	55 (0.9)	▲ 55 (1.7)	47 (1.1)	58 (1.7)	56 (1.6)
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A):						
Colombia	39 (1.5)	35 (0.9)	34 (1.6)	30 (1.0)	41 (2.0)	40 (1.0)
†1 Germany	60 (1.1)	55 (1.0)	57 (1.6)	52 (1.6)	50 (1.6)	52 (1.3)
Romania	51 (0.9)	46 (1.0)	48 (1.2)	45 (1.1)	42 (1.2)	41 (1.3)
Slovenia	▲ 64 (0.7)	58 (0.8)	59 (1.1)	54 (1.1)	60 (1.1)	57 (1.1)
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A):						
Denmark	▲ 57 (0.7)	49 (0.9)	▲ 44 (1.1)	38 (1.1)	50 (1.4)	44 (1.3)
Greece	▲ 55 (0.6)	50 (0.6)	▲ 54 (0.7)	49 (0.7)	51 (1.1)	51 (1.1)
Thailand	54 (0.8)	54 (0.9)	42 (1.2)	44 (1.5)	62 (1.2)	62 (1.3)
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A):						
1 Israel	▲ 62 (1.1)	54 (1.1)	▲ 58 (1.7)	50 (1.6)	57 (2.1)	49 (1.9)
South Africa	29 (1.9)	25 (1.3)	28 (2.0)	25 (1.2)	27 (1.9)	24 (1.5)

▲ = Gender difference statistically significant at .05 level, adjusted for multiple comparisons

*   Eighth grade in most countries; see Appendix A for information about the grades tested in each country.
†   Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
1   National Desired Population does not cover all of International Desired Population (see Appendix A). 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 Appendix A).
( ) 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), 1994-95.

Summary of Gender Differences in Average Mathematics and Science Achievement on TIMSS

Exhibit 1.11

Gender Differences in Science Literacy
Final Year of Secondary School*

Country	Males		Females		Difference	TCI	Gender Difference
	Percent of Students	Mean Achievement	Percent of Students	Mean Achievement			
[2] Cyprus	45 (2.1)	459 (5.8)	55 (2.1)	439 (3.0)	20 (6.5)	48%	
[†] New Zealand	49 (1.7)	543 (7.1)	51 (1.7)	515 (5.2)	28 (8.8)	70%	
Hungary	52 (2.5)	484 (4.2)	48 (2.5)	455 (4.3)	29 (6.0)	65%	
[1] Lithuania	35 (3.0)	481 (6.4)	65 (3.0)	450 (7.3)	31 (9.7)	43%	
Switzerland	56 (2.5)	540 (6.1)	44 (2.5)	500 (7.8)	40 (9.9)	82%	
[2] Russian Federation	38 (1.0)	510 (5.7)	62 (1.0)	463 (6.7)	47 (8.8)	48%	
Sweden	49 (2.5)	585 (5.9)	51 (2.5)	534 (3.5)	50 (6.8)	71%	
Czech Republic	51 (5.1)	512 (8.8)	49 (5.1)	460 (11.0)	51 (14.0)	78%	
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):							
Australia	42 (2.9)	547 (11.5)	58 (2.9)	513 (9.4)	34 (14.8)	68%	
[2] Austria	39 (3.2)	554 (8.7)	61 (3.2)	501 (5.8)	53 (10.4)	76%	
Canada	47 (1.4)	550 (3.6)	53 (1.4)	518 (3.8)	32 (5.2)	70%	
France	47 (3.1)	508 (6.7)	53 (3.1)	468 (4.8)	39 (8.3)	84%	
Iceland	48 (0.8)	572 (2.7)	52 (0.8)	530 (2.1)	41 (3.4)	55%	
[1] Italy	46 (3.3)	495 (6.7)	54 (3.3)	458 (5.6)	37 (8.8)	52%	
Norway	51 (2.0)	574 (5.1)	49 (2.0)	513 (4.5)	61 (6.8)	84%	
United States	50 (1.3)	492 (4.5)	50 (1.3)	469 (3.9)	23 (5.9)	63%	
Countries With Unapproved Student Sampling (See Appendix A):							
[†] Germany	56 (5.2)	514 (7.9)	44 (5.2)	478 (8.5)	35 (11.6)	75%	
Countries With Unapproved Sampling Procedures and Low Participation Rates (See Appendix A):							
Denmark	45 (2.0)	532 (5.4)	55 (2.0)	490 (4.1)	41 (6.8)	58%	
[2] Netherlands	52 (2.3)	582 (5.7)	48 (2.3)	532 (6.2)	49 (8.4)	78%	
Slovenia	51 (3.3)	541 (12.7)	49 (3.3)	494 (6.4)	47 (14.3)	88%	
South Africa	49 (1.6)	367 (11.5)	51 (1.6)	333 (13.0)	34 (17.4)	49%	

Gender Difference chart — Females Score Higher | Males Score Higher
Scale: 120 80 40 0 40 80 120

■ Gender difference statistically significant at .05 level
□ Gender difference not statistically significant

International Averages

Males	Females	Difference
521	482	39

(Averages of All Country Means)

* See Appendix A for characteristics of students tested.
† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A).
1 National Desired Population does not cover all of International Desired Population (see Appendix A).
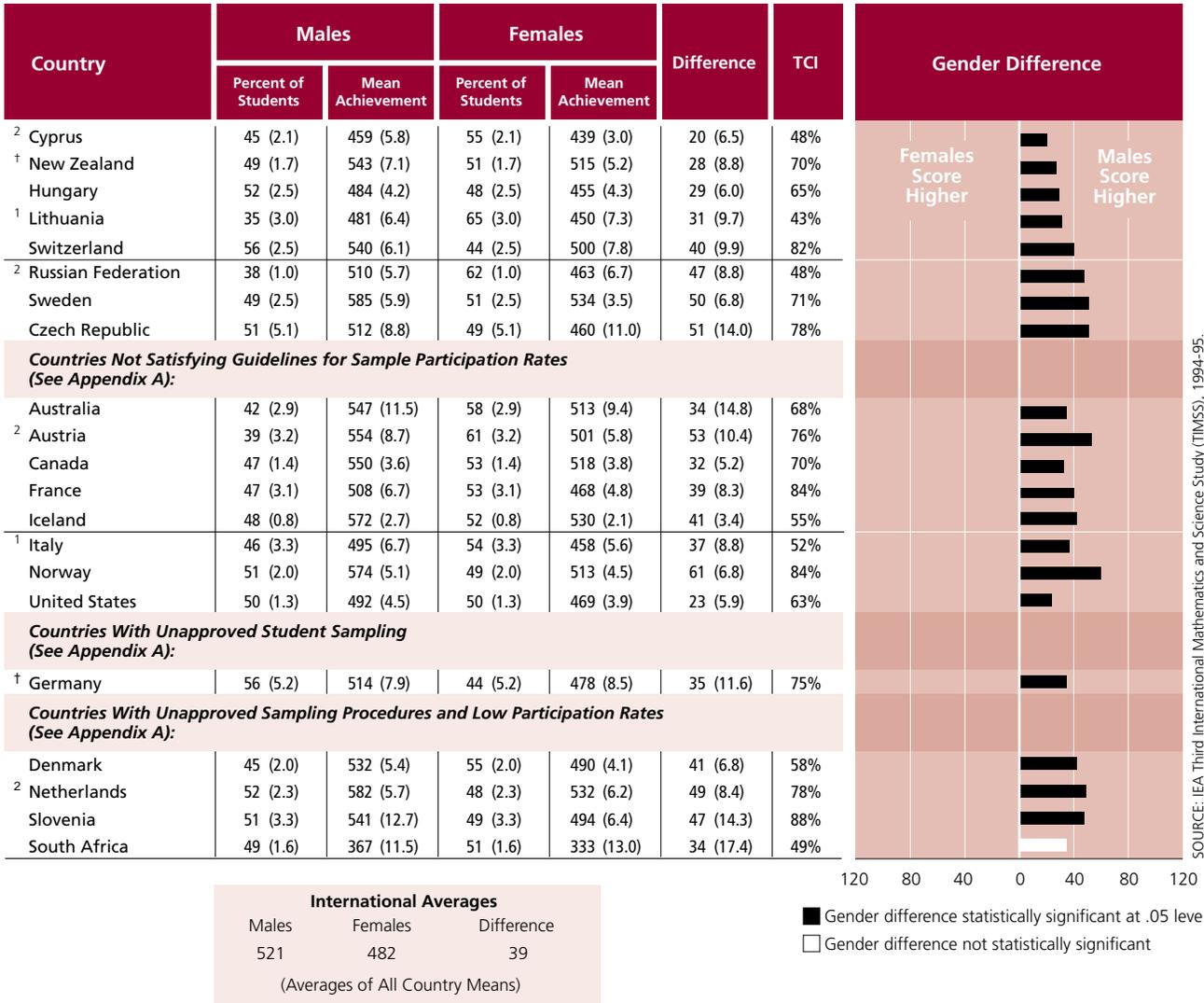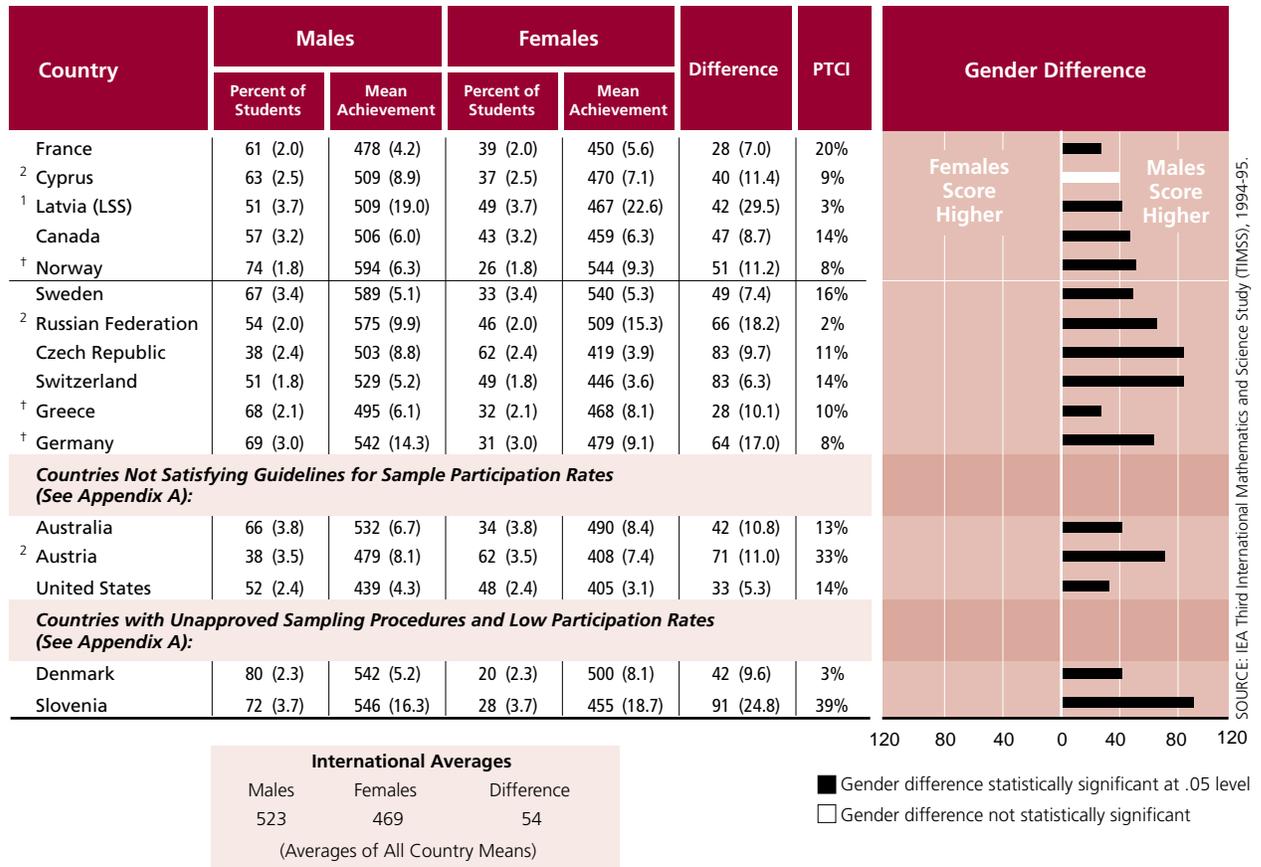2 National Defined Population covers less than 90 percent of National Desired Population (see Appendix A).
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Exhibit 1.12

Gender Differences in Physics Achievement
Final Year of Secondary School*

Country	Males		Females		Difference	PTCI	Gender Difference
	Percent of Students	Mean Achievement	Percent of Students	Mean Achievement			
France	61 (2.0)	478 (4.2)	39 (2.0)	450 (5.6)	28 (7.0)	20%	
2 Cyprus	63 (2.5)	509 (8.9)	37 (2.5)	470 (7.1)	40 (11.4)	9%	
1 Latvia (LSS)	51 (3.7)	509 (19.0)	49 (3.7)	467 (22.6)	42 (29.5)	3%	
Canada	57 (3.2)	506 (6.0)	43 (3.2)	459 (6.3)	47 (8.7)	14%	
† Norway	74 (1.8)	594 (6.3)	26 (1.8)	544 (9.3)	51 (11.2)	8%	
Sweden	67 (3.4)	589 (5.1)	33 (3.4)	540 (5.3)	49 (7.4)	16%	
2 Russian Federation	54 (2.0)	575 (9.9)	46 (2.0)	509 (15.3)	66 (18.2)	2%	
Czech Republic	38 (2.4)	503 (8.8)	62 (2.4)	419 (3.9)	83 (9.7)	11%	
Switzerland	51 (1.8)	529 (5.2)	49 (1.8)	446 (3.6)	83 (6.3)	14%	
† Greece	68 (2.1)	495 (6.1)	32 (2.1)	468 (8.1)	28 (10.1)	10%	
† Germany	69 (3.0)	542 (14.3)	31 (3.0)	479 (9.1)	64 (17.0)	8%	
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A):							
Australia	66 (3.8)	532 (6.7)	34 (3.8)	490 (8.4)	42 (10.8)	13%	
2 Austria	38 (3.5)	479 (8.1)	62 (3.5)	408 (7.4)	71 (11.0)	33%	
United States	52 (2.4)	439 (4.3)	48 (2.4)	405 (3.1)	33 (5.3)	14%	
Countries with Unapproved Sampling Procedures and Low Participation Rates (See Appendix A):							
Denmark	80 (2.3)	542 (5.2)	20 (2.3)	500 (8.1)	42 (9.6)	3%	
Slovenia	72 (3.7)	546 (16.3)	28 (3.7)	455 (18.7)	91 (24.8)	39%	

Females Score Higher — Males Score Higher

120 80 40 0 40 80 120

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

International Averages

Males	Females	Difference
523	469	54

(Averages of All Country Means)

■ Gender difference statistically significant at .05 level
□ Gender difference not statistically significant

* See Appendix A for characteristics of the students tested.

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

1 National Desired Population does not cover all of International Desired Population (see Appendix A). Because population 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 Appendix A).

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

Patterns Across Grades in the Gender Differences in Mathematics and Science Achievement

The TIMSS data summarized in this chapter indicate several important patterns of gender differences in average mathematics and science achievement.

- The gender differences in achievement in both curriculum areas widened at the upper grades. Thus, while males in the fourth grade had higher achievement than females in only some countries, by the final year of secondary school gender differences in performance were pervasive – with males having significantly higher achievement than females in both curriculum areas in almost every TIMSS country.

- The gender differences were more pronounced in science than in mathematics. Still, by the final year of secondary school, males had significantly higher average achievement than females in most countries in both mathematics and science.

- The data by content area for fourth and eighth grades showed that differences in performance by gender vary by content areas. For example, in mathematics males outperformed females in measurement but females exhibited a slight edge in algebra. In science, males outperformed females in earth science, physics, and chemistry, but not in life science or environmental issues.