In 1994-95, the International Association for the Evaluation of Educational Achievement (IEA) conducted the Third International Mathematics and Science Study (TIMSS) in 41 countries. The IEA is a collaborative of research institutions in 53 education systems around the world. Its primary purpose is to conduct large-scale comparative studies of educational achievement and to gain a better understanding of the effects of policies and practices on achievement within and across systems of education. Since its inception in 1959, the IEA has sponsored more than 15 studies of cross-national achievement, including TIMSS — the largest and most ambitious IEA study conducted to date. TIMSS assessed students in mathematics and science at three points in the education system — at the end of primary school (third and fourth grades in most countries), at the end of middle or lower-secondary school (seventh and eighth grades in most countries), and in the final year of secondary school (twelfth grade in most countries). Countries were required to participate in the assessment of students at the end of middle school, but could choose to participate in the other two assessments.

Achievement was measured through written tests of mathematics and science achievement taken by students in the third, fourth, seventh, and eighth grades. Students in their final year of secondary school were also tested in mathematics and science literacy. In addition, sub-populations of final-year students who had taken advanced mathematics or physics were tested in these subjects. In some countries, students in the fourth and eighth grades completed a performance assessment in addition to the written tests.

In the tradition of previous IEA studies, TIMSS sought to describe the contexts in which mathematics and science teaching and learning take place. To accomplish this, TIMSS gathered contextual information from students, teachers, and schools; investigated the curricula of the participating countries through an analysis of mathematics and science curriculum guides and textbooks; and compiled extensive information about the education systems of the participating countries. The mathematics and science achievement results for the three student populations, as well as background data collected from students and teachers, have been published in a series of reports.

1 While most IEA members are countries, some are education systems representing regions within countries.

The purpose of this report is to present information about the school contexts for learning mathematics and science, including school characteristics, policies, and practices. In each of the 41 education systems, the principal of each school sampled for the assessment was asked to complete a questionnaire addressing the school-level instructional context. The report is organized around five major topics:

- Role and responsibilities of schools and school principals
- School organization and staffing
- Organization for learning mathematics and science
- School resources
- School atmosphere

Table 1.1 presents the countries included in this report at each of the three grade levels. Results are reported for the upper grade of the primary school student population (fourth grade in most countries), the upper grade of the middle school student population (eighth grade in most countries), and for all students in their final year of secondary school (twelfth grade in most countries). Although there was considerable overlap in the questions asked of the school principals, some questions were not administered at all three populations.


Because the characteristics of its sample are not completely known, results for Israel at the final year of secondary school are not included in this report. Data for Greece and Latvia from the final year of secondary school are not included, as only advanced mathematics or physics students were sampled.

Information about population definitions and sampling procedures is provided in Appendix A.
# Table 1.1
Countries Included in Report

<table>
<thead>
<tr>
<th>Fourth Grade</th>
<th>Eighth Grade</th>
<th>Final Year of Secondary School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australia</td>
<td>Australia</td>
</tr>
<tr>
<td>Austria</td>
<td>Austria</td>
<td>Austria</td>
</tr>
<tr>
<td>Canada</td>
<td>Belgium (Flemish)</td>
<td>Canada</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Belgium (French)</td>
<td>Bulgaria</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Bulgaria</td>
<td>Canada</td>
</tr>
<tr>
<td>England</td>
<td>Colombia</td>
<td>France</td>
</tr>
<tr>
<td>Greece</td>
<td>Cyprus</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>Croatia</td>
<td>Germany</td>
</tr>
<tr>
<td>Hungary</td>
<td>Czech Republic</td>
<td>Hungary</td>
</tr>
<tr>
<td>Iceland</td>
<td>Denmark</td>
<td>Iceland</td>
</tr>
<tr>
<td>Iran, Islamic Republic</td>
<td>Indonesia</td>
<td>Italy</td>
</tr>
<tr>
<td>Ireland</td>
<td>France</td>
<td>Lithuania</td>
</tr>
<tr>
<td>Israel</td>
<td>Greece</td>
<td>New Zealand</td>
</tr>
<tr>
<td>Japan</td>
<td>Hong Kong</td>
<td>Norway</td>
</tr>
<tr>
<td>Korea, Republic of</td>
<td>Singapore</td>
<td>New Zealand</td>
</tr>
<tr>
<td>Kuwait</td>
<td>Latvia</td>
<td>Norway</td>
</tr>
<tr>
<td>Latvia</td>
<td>Netherlands</td>
<td>Norway</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Portugal</td>
<td>Portugal</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Romania</td>
<td>Romania</td>
</tr>
<tr>
<td>Norway</td>
<td>Russian Federation</td>
<td>Scotland</td>
</tr>
<tr>
<td>Norway</td>
<td>Scotland</td>
<td>South Africa</td>
</tr>
<tr>
<td>Portugal</td>
<td>Singapore</td>
<td>Spain</td>
</tr>
<tr>
<td>Portugal</td>
<td>Slovak Republic</td>
<td>Slovenia</td>
</tr>
<tr>
<td>Scotland</td>
<td>Slovenia</td>
<td>Sweden</td>
</tr>
<tr>
<td>Singapore</td>
<td>South Africa</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Spain</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Thailand</td>
<td>Sweden</td>
<td>Switzerland</td>
</tr>
<tr>
<td>United States</td>
<td>Thailand</td>
<td>United States</td>
</tr>
</tbody>
</table>


Table 1.2 presents information about the grades and students tested for TIMSS and included in this report. For grades four and eight, the table presents, for each country, the name the country uses for the grade, the years of formal schooling the students tested have had, and the average age of the students tested. In most countries, the fourth-grade students have had four years of formal schooling, not including pre-primary school; at the eighth grade, students in most countries have had eight years.

Table 1.2 also presents information about the students tested in the final year of secondary school. There are variations across and within countries with respect to the grades representing the final year of schooling. In some countries, all students in their final year of schooling are in the same grade (e.g., secondary schooling ends for all students in grade 12). In other countries, determining the final year of schooling is more complicated because there are one or more academic tracks, one or more vocational tracks, and apprenticeship programs. Nonetheless, the goal was to identify the final year of each type of program and test the students in that final year. More information about the structure of the upper-secondary systems and the students tested is provided in the international report for this population.

For the students in the final year of secondary school, Table 1.2 presents the grades tested in each country and the average age of these students, as well as the TIMSS Coverage Index (TCI), which is a measure of how much of the school-leaving age cohort is represented in the sample. The TCI reflects any omissions from the sample, such as students who were excluded because of handicap or who had dropped out of school, and, in some countries, tracks or educational programs that were not covered by the sample.

---

5 More information about the TIMSS Coverage Index and how it was computed for each country is provided in Appendix A.
Table 1.2

Information About the Grades Tested

<table>
<thead>
<tr>
<th>Country</th>
<th>Fourth Grade (TIMSS Population 1 Upper Grade)</th>
<th>Eighth Grade (TIMSS Population 2 Upper Grade)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Country’s Name for Grade Tested</td>
<td>Years of Formal Schooling Including Grade Tested</td>
</tr>
<tr>
<td>Australia</td>
<td>4 or 5</td>
<td>4 or 5</td>
</tr>
<tr>
<td>Austria</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Belgium (F)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Belgium (Fr)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Canada</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Colombia</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Cyprus</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Denmark</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>England</td>
<td>Year 5</td>
<td>5</td>
</tr>
<tr>
<td>France</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Germany</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Greece</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>Primary 4</td>
<td>4</td>
</tr>
<tr>
<td>Hungary</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Iceland</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Iran, Islamic Rep.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Ireland</td>
<td>4th Class</td>
<td>4</td>
</tr>
<tr>
<td>Israel</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Japan</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Korea</td>
<td>4th Grade</td>
<td>4</td>
</tr>
<tr>
<td>Kuwait</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Latvia</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Lithuania</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Netherlands</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Standard 3</td>
<td>4.5 - 5.5</td>
</tr>
<tr>
<td>Norway</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Portugal</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Romania</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Scottland</td>
<td>Year 5</td>
<td>5</td>
</tr>
<tr>
<td>Singapore</td>
<td>Primary 4</td>
<td>4</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Slovenia</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>South Africa</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Spain</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Sweden</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Switzerland (German)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>(French and Italian)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Thailand</td>
<td>Primary 4</td>
<td>4</td>
</tr>
<tr>
<td>United States</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

1 Years of Formal Schooling based on the number of years children in the grade level have been in formal schooling, beginning with primary education (International Standard Classification of Education Level 1). Does not include preprimary education.

2 Australia: Each state/territory has its own policy regarding age of entry to primary school. In four of the eight states/territories students in grades 4 and 8 were tested; in the other four states/territories students in grades 5 and 9 were tested.

3 New Zealand: The majority of students begin school on or near their fifth birthday so the “years of formal schooling” vary.

4 Russian Federation: 70% of students in the eighth grade have had 7 years of formal schooling.

A dash (–) indicates that the country did not test students in this grade level or that data are not presented in this report.
### Table 1.2 (Continued)

**Information About the Grades Tested**

<table>
<thead>
<tr>
<th>Country</th>
<th>Final Year of Secondary School (Varies Across and Within Countries)</th>
<th>Grades Tested for TIMSS</th>
<th>TIMSS Coverage Index (TCI)†</th>
<th>Average Age of Students Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Grade 12</td>
<td>68%</td>
<td>17.7</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>Grade 12 (academic); Grade 13 (higher technical and vocational); Grades 10, 11, 12 (intermediate technical and vocational); Grades 12, 13, 14 (apprenticeship programs)</td>
<td>76%</td>
<td>19.1</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>Grade 12 (all provinces except Quebec); Grades 13 and 14 (depending on program) in Quebec; Ontario OAC students in Grade 13</td>
<td>70%</td>
<td>18.6</td>
<td></td>
</tr>
<tr>
<td>Cyprus</td>
<td>Grade 12 of lycea and technical schools</td>
<td>48%</td>
<td>17.7</td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Grades 12 and 13 (technical and gymnasium); Grades 10, 11, 12 (vocational schools)</td>
<td>78%</td>
<td>17.8</td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>Grade 12 (general and vocational schools)</td>
<td>58%</td>
<td>19.1</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>Grade 12 (general and technicological schools), Grade 13 (vocational); Grade 11 and 13 (vocational)</td>
<td>84%</td>
<td>18.8</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>Grade 12 (former East Germany); Grade 13 (former West Germany)</td>
<td>75%</td>
<td>19.5</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>Grade 12 (academic and vocational); Grade 10 (trade school)</td>
<td>65%</td>
<td>17.5</td>
<td></td>
</tr>
<tr>
<td>Iceland</td>
<td>Grades 12, 13, 14</td>
<td>55%</td>
<td>21.2</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>Grades 12, 13, 14</td>
<td>52%</td>
<td>18.7</td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td>Grade 12</td>
<td>43%</td>
<td>18.1</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>Grade 12 (pre-university); Grade 11 (senior general secondary); Grade 12 (senior secondary vocational)</td>
<td>78%</td>
<td>18.5</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td>Grade 11 and Grade 12</td>
<td>70%</td>
<td>17.6</td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>Grade 12</td>
<td>84%</td>
<td>19.5</td>
<td></td>
</tr>
<tr>
<td>Russian Federation</td>
<td>Grade 11 (general secondary)</td>
<td>48%</td>
<td>16.9</td>
<td></td>
</tr>
<tr>
<td>Slovenia</td>
<td>Grade 12 (gymnasium and technical); Grade 11 (vocational)</td>
<td>88%</td>
<td>18.8</td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>Grade 12 (depending on whether reform had been implemented in school)</td>
<td>71%</td>
<td>18.9</td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>Grade 12 or 13 (gymnasium); Grade 12 (general and teacher training); Grade 11, 12, 13 (vocational)</td>
<td>82%</td>
<td>19.8</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>Grade 12</td>
<td>63%</td>
<td>18.1</td>
<td></td>
</tr>
</tbody>
</table>

† TIMSS Coverage Index (TCI): Estimated percentage of school-leaving age cohort covered by the TIMSS final-year sample. The TCI was computed by forming a ratio of the size of the student population covered by the TIMSS sample, as estimated from the sample itself, to the size of the school-leaving age cohort, which was derived from official census figures supplied by each country (see Appendix A).
TIMSS Achievement Results

To help interpret the school questionnaire data, this section summarizes the mathematics and science achievement of students in the fourth and eighth grades, and the mathematics and science literacy achievement of students in their final year of secondary school. Each table presents the mean (or average) achievement for the countries that participated in each assessment and whether the country mean is higher than, the same as, or lower than the international average.6

To illustrate the broad range of achievement across and within countries, each table also shows the distribution of student performance within each country. Achievement is shown for the 25th and 75th percentiles as well as for the 5th and 95th percentiles. Each percentile point indicates the percentages of students performing below and above that point on the scale. For example, 25% of the students in each country performed below the 25th percentile for that country, and 75% performed above the 25th percentile. The range between the 25th and 75th percentiles represents performance by the middle half of the students. In contrast, performance below the 5th and above the 95th percentiles represents the extremes in lower and higher achievement. The dark boxes at the midpoints of the distributions show the 95% confidence intervals around the average achievement in each country.7 These intervals can be compared with the international average. Countries with a triangle pointing up performed above the international average, those with a dot performed about the same as the international average, and those with triangles pointing down performed below the international average.

The countries, shown in decreasing order of mean achievement in the upper part of the tables, were judged to have met the TIMSS requirements for testing a representative sample of students. 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. In the fourth- and eighth-grade assessments, to provide a better curricular match, some countries elected to test students in grades that did not meet the TIMSS requirements, which led to their students being somewhat older than those in the other countries. Some countries encountered various difficulties in implementing the prescribed methods for within-school sampling. A discussion of the sampling procedures and outcomes for each country can be found in Appendix A.

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6 TIMSS used item response theory (IRT) methods to summarize the achievement. Data in this section are from six scales: third & fourth grade mathematics, third & fourth grade science, seventh & eighth grade mathematics, seventh & eighth grade science, final-year mathematics literacy, and final-year science literacy. Each scale was constructed to have a mean of 500 and a standard deviation of 100. For more detailed information, see the “IRT Scaling and Data Analysis” section of Appendix A.

7 See Appendix A for more details about calculating standard errors and confidence intervals for the TIMSS statistics.
Tables 1.3 and 1.4 present the mathematics and science achievement results, respectively, for students in the fourth grade in 26 countries. As shown in Table 1.3, in mathematics at fourth grade, Singapore was the top-performing country, followed by Korea, Japan, and Hong Kong. In science, shown in Table 1.4, the top-performing countries at fourth grade were Korea, Japan, the United States, and Austria.

Tables 1.5 and 1.6 present the mathematics and science achievement results, respectively, for students in the eighth grade in 41 countries. As shown in Table 1.5, in mathematics at eighth grade, Singapore was the top-performing country, followed by Korea, Japan, and Hong Kong. In science, shown in Table 1.6, the top-performing countries at eighth grade were Singapore, the Czech Republic, Japan, and Korea.

Tables 1.7 and 1.8 present achievement on the mathematics literacy scale and the science literacy scale, respectively, for students in their final year of secondary school in 21 countries. As shown in Table 1.7, in mathematics literacy, the top-performing countries were the Netherlands, Sweden, Denmark, and Switzerland. In science literacy, shown in Table 1.8, the top-performing countries were Sweden, the Netherlands, Iceland, and Norway. Not all countries were able to test all students in their final year of secondary school, and not all students of school-leaving age are still enrolled in school. Tables 1.7 and 1.8 also present, for each country, a value for the “TIMSS Coverage Index,” or TCI. The TCI is an estimate of the percentage of the school-leaving age cohort covered by the TIMSS final-year student sample.
### Table 1.3

**Distributions of Mathematics Achievement - Fourth Grade**

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean</th>
<th>Mathematics Achievement Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>625 (5.3)</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>611 (2.1)</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>597 (2.1)</td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>587 (4.3)</td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>567 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>550 (3.4)</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>545 (3.0)</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>532 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Scotland</td>
<td>520 (3.9)</td>
<td></td>
</tr>
<tr>
<td>England</td>
<td>513 (3.2)</td>
<td></td>
</tr>
<tr>
<td>Cyprus</td>
<td>502 (3.1)</td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>502 (3.0)</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td>499 (4.3)</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>492 (4.4)</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>475 (3.5)</td>
<td></td>
</tr>
<tr>
<td>Iceland</td>
<td>474 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Latvia (LSS)</td>
<td>525 (4.8)</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>577 (3.4)</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>546 (3.1)</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>559 (3.1)</td>
<td></td>
</tr>
<tr>
<td>Latvia (LSS)</td>
<td>525 (4.8)</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>577 (3.4)</td>
<td></td>
</tr>
<tr>
<td>Slovenia</td>
<td>552 (3.2)</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>548 (3.7)</td>
<td></td>
</tr>
<tr>
<td>Israel</td>
<td>531 (3.5)</td>
<td></td>
</tr>
<tr>
<td>Kuwait</td>
<td>400 (2.8)</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>490 (4.7)</td>
<td></td>
</tr>
</tbody>
</table>

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

- Australia
- Austria
- Latvia (LSS)
- Netherlands

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

- Slovenia

**Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A for Details):**

- Hungary

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

- Israel
- Kuwait
- Thailand

---

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

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

* See Table 1.2 for more information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
Table 1.4

Distributions of Science Achievement - Fourth Grade*

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean</th>
<th>Science Achievement Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea</td>
<td>597 (1.9)</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>574 (1.8)</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>565 (3.1)</td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>557 (3.1)</td>
<td></td>
</tr>
<tr>
<td>England</td>
<td>551 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>549 (3.0)</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>547 (5.0)</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>539 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Scotland</td>
<td>536 (4.2)</td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>533 (3.7)</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td>531 (4.9)</td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>530 (3.6)</td>
<td></td>
</tr>
<tr>
<td>Iceland</td>
<td>505 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>497 (4.1)</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>480 (4.0)</td>
<td></td>
</tr>
<tr>
<td>Cyprus</td>
<td>475 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Iran, Islamic Rep.</td>
<td>416 (3.9)</td>
<td></td>
</tr>
</tbody>
</table>

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

- Australia
- Austria
- Latvia (LSS)
- Netherlands

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

- Slovenia

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

- Hungary

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

- Israel
- Kuwait
- Thailand

International Average = 524
(Average of all Country Means)

▲ = Country mean significantly higher than international mean
▼ = Country mean significantly lower than international mean
● = No statistically significant difference between country mean and international mean

1 National Desired Population does not cover all of International Desired Population (see Table A.1). 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 Table A.1).
† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details).
* See Table 1.2 for more information about the grades tested in each country.
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
1 National Desired Population does not cover all of International Desired Population (see Table A.2). 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 Table A.2).

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

* See Table 1.2 for more information about the grades tested in each country.

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

### Table 1.5

Distributions of Mathematics Achievement - Eighth Grade*

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean Mathematics Achievement Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>643 (4.9)</td>
</tr>
<tr>
<td>Korea</td>
<td>607 (2.4)</td>
</tr>
<tr>
<td>Japan</td>
<td>605 (1.9)</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>588 (6.5)</td>
</tr>
<tr>
<td>1 Belgium (Fl)</td>
<td>565 (5.7)</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>564 (4.9)</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>547 (3.3)</td>
</tr>
<tr>
<td>Switzerland</td>
<td>545 (2.8)</td>
</tr>
<tr>
<td>France</td>
<td>538 (2.9)</td>
</tr>
<tr>
<td>Hungary</td>
<td>537 (3.2)</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>535 (5.3)</td>
</tr>
<tr>
<td>Ireland</td>
<td>527 (5.1)</td>
</tr>
<tr>
<td>Canada</td>
<td>527 (2.4)</td>
</tr>
<tr>
<td>Sweden</td>
<td>519 (3.0)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>508 (4.5)</td>
</tr>
<tr>
<td>Belgium (Fr)</td>
<td>506 (2.6)</td>
</tr>
<tr>
<td>Norway</td>
<td>503 (2.2)</td>
</tr>
<tr>
<td>United States</td>
<td>500 (4.6)</td>
</tr>
<tr>
<td>1 Latvia (LSS)</td>
<td>493 (3.1)</td>
</tr>
<tr>
<td>Spain</td>
<td>487 (2.0)</td>
</tr>
<tr>
<td>England</td>
<td>487 (4.5)</td>
</tr>
<tr>
<td>Italy</td>
<td>477 (3.5)</td>
</tr>
<tr>
<td>Cyprus</td>
<td>474 (1.9)</td>
</tr>
<tr>
<td>Portugal</td>
<td>454 (2.5)</td>
</tr>
<tr>
<td>Iran, Islamic Rep.</td>
<td>428 (2.2)</td>
</tr>
<tr>
<td>Australia</td>
<td>530 (4.0)</td>
</tr>
<tr>
<td>Austria</td>
<td>539 (3.0)</td>
</tr>
<tr>
<td>Belgium (Fr)</td>
<td>526 (3.4)</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>540 (6.3)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>541 (6.7)</td>
</tr>
<tr>
<td>Scotland</td>
<td>499 (5.5)</td>
</tr>
<tr>
<td>Colombia</td>
<td>385 (3.4)</td>
</tr>
<tr>
<td>1 Germany</td>
<td>509 (4.5)</td>
</tr>
<tr>
<td>Romania</td>
<td>482 (4.0)</td>
</tr>
<tr>
<td>Slovenia</td>
<td>541 (3.1)</td>
</tr>
<tr>
<td>Denmark</td>
<td>502 (2.8)</td>
</tr>
<tr>
<td>Greece</td>
<td>484 (3.1)</td>
</tr>
<tr>
<td>Thailand</td>
<td>522 (5.7)</td>
</tr>
<tr>
<td>1 Israel</td>
<td>522 (6.2)</td>
</tr>
<tr>
<td>Kuwait</td>
<td>392 (2.5)</td>
</tr>
<tr>
<td>South Africa</td>
<td>354 (4.4)</td>
</tr>
</tbody>
</table>

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

- Australia
- Austria
- Belgium (Fl)
- Bulgaria
- Netherlands
- Scotland

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

- Colombia
- 1 Germany
- Romania
- Slovenia

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

- Denmark
- Greece
- Thailand

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

- Israel
- Kuwait
- South Africa

International Average = 513 (Average of all Country Means)

▲ = Country mean significantly higher than international mean
▼ = Country mean significantly lower than international mean
● = No statistically significant difference between country mean and international mean

1 National Desired Population does not cover all of International Desired Population (see Table A.2). 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 Table A.2).

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

* See Table 1.2 for more information about the grades tested in each country.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
Table 1.6
Distributions of Science Achievement - Eighth Grade*

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean</th>
<th>Science Achievement Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>607 (5.5)</td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>574 (4.3)</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>571 (1.6)</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>565 (1.9)</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>554 (2.8)</td>
<td></td>
</tr>
<tr>
<td>England</td>
<td>552 (3.3)</td>
<td></td>
</tr>
<tr>
<td>† Belgium (Fi)</td>
<td>550 (4.2)</td>
<td></td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>544 (3.2)</td>
<td></td>
</tr>
<tr>
<td>Russian Federation</td>
<td>538 (4.0)</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>538 (4.5)</td>
<td></td>
</tr>
<tr>
<td>† Sweden</td>
<td>535 (3.0)</td>
<td></td>
</tr>
<tr>
<td>† United States</td>
<td>534 (4.7)</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>531 (2.6)</td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>527 (1.9)</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td>525 (4.4)</td>
<td></td>
</tr>
<tr>
<td>† Hong Kong</td>
<td>522 (4.7)</td>
<td></td>
</tr>
<tr>
<td>† Switzerland</td>
<td>522 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>517 (1.7)</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>498 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Iceland</td>
<td>494 (4.0)</td>
<td></td>
</tr>
<tr>
<td>† Latvia (LSS)</td>
<td>485 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>480 (2.3)</td>
<td></td>
</tr>
<tr>
<td>† Belgium (Fr)</td>
<td>476 (3.4)</td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td>470 (2.4)</td>
<td></td>
</tr>
<tr>
<td>† Egypt</td>
<td>463 (1.9)</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>545 (3.9)</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>558 (3.7)</td>
<td></td>
</tr>
<tr>
<td>Belgium (Fr)</td>
<td>471 (2.8)</td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>565 (5.3)</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>560 (5.0)</td>
<td></td>
</tr>
<tr>
<td>Scotland</td>
<td>517 (5.2)</td>
<td></td>
</tr>
<tr>
<td>Colombia</td>
<td>411 (4.1)</td>
<td></td>
</tr>
<tr>
<td>† Germany</td>
<td>531 (4.8)</td>
<td></td>
</tr>
<tr>
<td>Romania</td>
<td>486 (4.7)</td>
<td></td>
</tr>
<tr>
<td>Slovenia</td>
<td>560 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>478 (3.1)</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>497 (2.2)</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>525 (3.7)</td>
<td></td>
</tr>
<tr>
<td>Israel</td>
<td>524 (5.7)</td>
<td></td>
</tr>
<tr>
<td>Kuwait</td>
<td>430 (3.7)</td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>326 (6.6)</td>
<td></td>
</tr>
</tbody>
</table>

Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A for Details):
- Australia
- Austria
- Belgium (Fr)
- Bulgaria
- Netherlands
- Scotland
- Colombia
- Germany
- Romania
- Slovenia

Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A for Details):
- Denmark
- Greece
- Thailand

Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A for Details):
- Israel
- Kuwait
- South Africa

Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A for Details):
- International Average = 516 (Average of all Country Means)
- ▲ Country mean significantly higher than international mean
- ▼ Country mean significantly lower than international mean
- ♣ No statistically significant difference between country mean and international mean

1 National Desired Population does not cover all of International Desired Population (see Table A.2). 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 Table A.2).
† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details).
* See Table 1.2 for more information about the grades tested in each country.
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
Table 1.7
Distributions of Achievement in Mathematics Literacy - Final Year of Secondary School*

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean</th>
<th>TCI*</th>
<th>Mathematics Literacy Achievement Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>▲ 552 (4.3)</td>
<td>71%</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>▲ 540 (5.8)</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td>▲ 522 (4.5)</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>▼ 483 (3.2)</td>
<td>65%</td>
<td></td>
</tr>
<tr>
<td>Russian Federation</td>
<td>▼ 471 (6.2)</td>
<td>48%</td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td>▼ 469 (6.1)</td>
<td>43%</td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>● 466 (12.3)</td>
<td>78%</td>
<td></td>
</tr>
<tr>
<td>Cyprus</td>
<td>▼ 446 (2.5)</td>
<td>48%</td>
<td></td>
</tr>
</tbody>
</table>

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

- Australia
- Austria
- Canada
- France
- Iceland
- Italy
- Norway
- United States

Countries With Unapproved Student Sampling (See Appendix A for Details)

- Germany

Countries With Unapproved Sampling Procedures and Low Participation Rates (See Appendix A for Details)

- Denmark
- Netherlands
- Slovenia
- South Africa

---

1 National Desired Population does not cover all of International Desired Population (see Table A.3).
2 National Defined Population covers less than 90 percent of National Desired Population (see Table A.3).
† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details).
✦ The TIMSS Coverage Index (TCI) is an estimate of the percentage of the school-leaving age cohort covered by the TIMSS final-year student sample.
* See Table 1.2 for more information about the grades tested in each country.
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
### Table 1.8

Distributions of Achievement in Science Literacy - Final Year of Secondary School*

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean</th>
<th>TCI*</th>
<th>Science Literacy Achievement Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>▲ 559 (4.4)</td>
<td>71%</td>
<td></td>
</tr>
<tr>
<td>† New Zealand</td>
<td>▲ 529 (5.2)</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>▲ 523 (5.3)</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>● 487 (8.8)</td>
<td>78%</td>
<td></td>
</tr>
<tr>
<td>‡ Russian Federation</td>
<td>▼ 481 (5.7)</td>
<td>48%</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>▼ 471 (3.0)</td>
<td>65%</td>
<td></td>
</tr>
<tr>
<td>† Lithuania</td>
<td>▼ 461 (5.7)</td>
<td>43%</td>
<td></td>
</tr>
<tr>
<td>‡ Cyprus</td>
<td>▼ 448 (3.0)</td>
<td>48%</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean</th>
<th>TCI*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>● 527 (9.8)</td>
<td>68%</td>
</tr>
<tr>
<td>‡ Austria</td>
<td>▲ 520 (5.6)</td>
<td>76%</td>
</tr>
<tr>
<td>Canada</td>
<td>▲ 532 (2.6)</td>
<td>70%</td>
</tr>
<tr>
<td>France</td>
<td>● 487 (5.1)</td>
<td>84%</td>
</tr>
<tr>
<td>Iceland</td>
<td>▲ 549 (1.5)</td>
<td>55%</td>
</tr>
<tr>
<td>† Italy</td>
<td>▼ 475 (5.3)</td>
<td>52%</td>
</tr>
<tr>
<td>Norway</td>
<td>▲ 544 (4.1)</td>
<td>84%</td>
</tr>
<tr>
<td>United States</td>
<td>▼ 480 (3.3)</td>
<td>63%</td>
</tr>
</tbody>
</table>

#### Countries With Unapproved Student Sampling (See Appendix A for Details)

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean</th>
<th>TCI*</th>
</tr>
</thead>
<tbody>
<tr>
<td>† Germany</td>
<td>● 497 (5.1)</td>
<td>75%</td>
</tr>
</tbody>
</table>

#### Countries With Unapproved Sampling Procedures and Low Participation Rates (See Appendix A for Details)

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean</th>
<th>TCI*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>● 509 (3.6)</td>
<td>58%</td>
</tr>
<tr>
<td>‡ Netherlands</td>
<td>▲ 558 (5.3)</td>
<td>78%</td>
</tr>
<tr>
<td>Slovenia</td>
<td>● 517 (8.2)</td>
<td>88%</td>
</tr>
<tr>
<td>South Africa</td>
<td>▼ 349 (10.5)</td>
<td>49%</td>
</tr>
</tbody>
</table>

---

1 National Desired Population does not cover all of International Desired Population (see Table A.3).
2 National Defined Population covers less than 90 percent of National Desired Population (see Table A.3).
† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details).
‡ The TIMSS Coverage Index (TCI) is an estimate of the percentage of the school-leaving age cohort covered by the TIMSS final-year student sample.
* See Table 1.2 for more information about the grades tested in each country.
() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.