



PISA 2012

Performance of Puerto Rico 15-Year-Old Students in Mathematics, Science, and Reading Literacy in an International Context

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Executive Summary

The Program for International Student Assessment (PISA) is a system of international assessments that allows countries to compare outcomes of learning as students near the end of compulsory schooling. PISA core assessments measure the performance of 15-year-old students in mathematics, science, and reading literacy every 3 years. Coordinated by the Organization for Economic Cooperation and Development (OECD), PISA was first implemented in 2000 in 32 countries. It has since grown to 65 countries in 2012.

In 2012, Puerto Rico administered PISA for the first time as a research study. The United States and the U.S. states of Connecticut, Florida, and Massachusetts also participated in PISA in 2012. In Puerto Rico, 56 public and private schools and 1,668 students participated in PISA. This resulted in an overall weighted school response rate of 100 percent and an overall weighted student participation rate of 91 percent.

This report focuses on the performance of Puerto Rico students relative to their peers around the world in education systems that participated in PISA 2012. Results are presented in terms of average scale score, the percentage of 15-year-old students reaching PISA proficiency levels, and the performance of education systems at selected percentiles. Performance along the index of economic, social, and cultural status (ESCS) index, the index of quality of schools' educational resources, and the index of schools' physical infrastructure are also examined.

In reporting PISA results for Puerto Rico, two types of comparison groups are provided—the aggregate comparison groups of the OECD average and the Latin America average, and individual education systems such as the United States. The OECD average is the average of all OECD member country averages with each country weighted equally. The Latin America average is the average of the eight Latin America participants in PISA with each country weighted equally. These countries include Brazil, Colombia, Costa Rica, Argentina, Peru, Chile, Uruguay, and Mexico. All differences described in this report are statistically significant at the .05 level. No statistical adjustments to account for multiple comparisons were used.

Key findings from the report include the following:

Mathematics literacy

- ▶ The Puerto Rico average mathematics literacy score (382) was lower than the OECD average, Latin America average, and U.S. average scores. Puerto Rico performance in mathematics literacy was the weakest of the three domains and the Puerto Rico average mathematics literacy score was lower than 58 of 65 education systems.
- ▶ Of the four content scales (*quantity, uncertainty and data, change and relationships, and space and shape*), Puerto Rico had the most education systems scoring above it on the *change and relationships* subscale, and the fewest education systems scoring above it on the *uncertainty and data* and the *space and shape* subscales.
- ▶ Nearly all students in Puerto Rico scored at proficiency levels 3 or below in mathematics literacy. The percentages of Puerto Rico students at proficiency levels 3, 2, 1, and below level 1 were lower than the OECD average and U.S. percentages. The percentage of Puerto Rico students at proficiency level 3 was lower than the Latin America average, but it was not measurably different than the Latin America average percentage at proficiency level 2. The percentage of Puerto Rico students at proficiency level 1 was higher than the Latin America average percentage but not measurably different than the Latin America average percentage at below proficiency level 1.
- ▶ The Puerto Rico average score at the 90th percentile was lower than the OECD average, Latin America average, and U.S. scores at the 90th percentile. The Puerto Rico average score at the 10th percentile was lower than the OECD average and U.S. scores at the 10th percentile but not measurably different from the Latin America average score at the 10th percentile. The Puerto Rico 90th-10th percentile gap of 157 scale score points was smaller than the OECD average, Latin America average, and U.S. 90th-10th percentile gaps. Mathematics literacy scores in Puerto Rico showed little variation and no education systems had a 90th-10th percentile gap smaller than Puerto Rico.

Science literacy

- ▶ Puerto Rico performance in science literacy was stronger than in mathematics literacy. The Puerto Rico average science literacy score (401) was lower than the OECD average and U.S. average scores but not measurably different than the Latin America average score. The Puerto Rico average science literacy score was lower than 55 of 65 education systems, compared to 58 for mathematics literacy.
- ▶ Nearly all students in Puerto Rico scored at proficiency levels 4 or below in science literacy. The percentages of Puerto Rico students scoring at proficiency levels 3 and 4 were lower than the OECD average and U.S. percentages but not measurably different than the Latin America average percentages. The percentage of Puerto Rico students scoring at proficiency level 2 was higher than the OECD average percentage but not measurably different than the Latin America average or U.S. percentages. The percentages of Puerto Rico students scoring at proficiency levels 1a, 1b, and below 1 were higher than the OECD average and U.S. percentages, but not measurably different than the Latin America average percentages.
- ▶ The Puerto Rico average score at the 90th percentile was lower than the OECD average and U.S. scores at the 90th percentile but not measurably different than the Latin America average score at the 90th percentile. The Puerto Rico average score at the 10th percentile was also lower than the OECD average and U.S. scores at the 10th percentile but not measurably different than the Latin America average score at the 10th percentile. The Puerto Rico 90th-10th percentile gap of 201 scale score points was smaller than the OECD average and U.S. 90th-10th percentile gaps but not measurably different than the Latin America average 90th-10th percentile gap. As with mathematics literacy, the 90th-10th percentile gap in science literacy was relatively small and only 2 education systems had 90th-10th percentile gaps smaller than Puerto Rico in science literacy.

Reading literacy

- ▶ Puerto Rico performance in reading literacy was the strongest of the three domains. The Puerto Rico average reading literacy score (404) was lower than the OECD average and U.S. average scores but not measurably different than the Latin America average score. The Puerto Rico average reading literacy score was lower than 53 of 65 education systems, compared to 58 for mathematics literacy and 55 for science literacy.
- ▶ Similar to science literacy, nearly all students in Puerto Rico scored at proficiency levels 4 or below in reading literacy. The percentages of Puerto Rico students scoring at proficiency levels 3 and 4 were lower than the OECD average and U.S. percentages but not measurably different than the Latin America average percentages. The percentage of Puerto Rico students scoring at proficiency level 2 was higher than the OECD average percentage but not measurably different than the Latin America average or U.S. percentages. The percentages of Puerto Rico students scoring at proficiency levels 1a, 1b, and below 1 were higher than the OECD average and U.S. percentages but not measurably different than the Latin America average percentages.
- ▶ The Puerto Rico average score at the 90th percentile was lower than the OECD average and U.S. scores at the 90th percentile but not measurably different than the Latin America average score at the 90th percentile. The Puerto Rico average score at the 10th percentile was also lower than the OECD average and U.S. scores at the 10th percentile but not measurably different than the Latin America average score at the 10th percentile. The Puerto Rico 90th-10th percentile gap of 224 scale score points was not measurably different than the OECD average, Latin America average, and U.S. 90th-10th percentile gaps. As with mathematics literacy and science literacy, the 90th-10th percentile gap in reading literacy was relatively small and only 6 education systems had 90th-10th percentile gaps smaller than Puerto Rico in reading literacy.



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Introduction

What is PISA?

The Program for International Student Assessment (PISA) is a system of international assessments that allows countries to compare outcomes of learning as students near the end of compulsory schooling. PISA core assessments measure the performance of 15-year-old students in mathematics, science, and reading literacy every 3 years. Coordinated by the Organization for Economic Cooperation and Development (OECD), PISA was first implemented in 2000 in 32 countries. It has since grown to 65 countries in 2012. In 2012, Puerto Rico administered PISA for the first time as a research study.

What PISA Measures

PISA's goal is to assess students' preparation for the challenges of life as young adults. PISA assesses the application of knowledge in mathematics, science, and reading literacy to problems within a real-life context (OECD 1999). PISA does not focus explicitly on curricular outcomes and uses the term "literacy" in each subject area to indicate its broad focus on the application of knowledge and skills. For example, when assessing mathematics, PISA examines how well 15-year-old students can understand, use, and reflect on mathematics for a variety of real-life problems and settings that they may not encounter in the classroom. Scores on the PISA scales represent skill levels along a continuum of literacy skills.

Each PISA data collection cycle assesses one of the three core subject areas in depth (considered the major subject area), although all three core subjects are assessed in each cycle (the other two subjects are considered minor subject areas for that assessment year). Mathematics was the major subject area in 2012. In 2012, mathematics, science, and reading literacy were assessed primarily through a paper-and-pencil assessment. In addition, education systems could participate in optional paper-based financial literacy, computer-based mathematics and reading, and computer-based problem solving assessments. Puerto Rico did not participate in these optional assessments.

Design and Administration of PISA

Puerto Rico administered PISA in 2012 as a research study that was funded and carried out by the Puerto Rico Department of Education (PRDE). The National Center for Education Statistics (NCES) is the U.S. PISA national center and is responsible for the implementation of PISA in the United States. NCES facilitated Puerto Rico's participation as a territory of the United States. Since PISA was administered in Puerto Rico as a research study, Puerto Rico's results were not reported by the OECD. Although Puerto Rico's results and data were not officially released, Puerto Rico followed all international procedures and met all sampling, data collection, and response rate requirements. Puerto Rico's participation in 2012 was designed to give PRDE and educators an idea of how Puerto Rico 15-year-olds perform in an international context, as well as to pave the way for full participation in PISA in 2015.

Mathematics Literacy

In PISA 2012, the major subject was mathematics literacy, defined as:

An individual's capacity to formulate, employ, and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts, and tools to describe, explain, and predict phenomena. It assists individuals to recognize the role that mathematics plays in the world and to make the well-founded judgments and decisions needed by constructive, engaged, and reflective citizens (OECD 2013a, p. 25).

More specifically, the PISA mathematics assessment and this report looks at four mathematical content categories:

Mathematical content categories (OECD 2013a, pp. 33-35):

- ▶ Change and relationship: Can students model change and relationships with the appropriate functions and equations?
- ▶ Space and shape: Can students understand perspective, create and read maps, and manipulate 3D objects?

- ▶ Quantity: Are 15-year-olds able to comprehend multiple representations of numbers, engage in mental calculation, employ estimation, and assess the reasonableness of results?
- ▶ Uncertainty and data: Can students use probability and statistics and other techniques of data representation and description to mathematically describe, model, and interpret uncertainty?

Mathematics literacy is reported both in terms of proficiency levels and scale scores (reported on a scale of 0–1,000). Exhibit 1 (see below) describes the six mathematics literacy proficiency levels and their respective cut scores.

Exhibit 1. Description of PISA proficiency levels on mathematics literacy scale: 2012

| Proficiency level and lower cut score | Task descriptions |
|--|---|
| Level 6 669 | At level 6, students can conceptualize, generalize, and utilize information based on their investigations and modeling of complex problem situations, and can use their knowledge in relatively non-standard contexts. They can link different information sources and representations and flexibly translate among them. Students at this level are capable of advanced mathematical thinking and reasoning. These students can apply this insight and understanding, along with a mastery of symbolic and formal mathematical operations and relationships, to develop new approaches and strategies for attacking novel situations. Students at this level can reflect on their actions, and can formulate and precisely communicate their actions and reflections regarding their findings, interpretations, arguments and the appropriateness of these to the original situations. |
| Level 5 607 | At level 5, students can develop and work with models for complex situations, identifying constraints and specifying assumptions. They can select, compare, and evaluate appropriate problem-solving strategies for dealing with complex problems related to these models. Students at this level can work strategically using broad, well-developed thinking and reasoning skills, appropriate linked representations, symbolic and formal characterizations, and insight pertaining to these situations. They begin to reflect on their work and can formulate and communicate their interpretations and reasoning. |
| Level 4 545 | At level 4, students can work effectively with explicit models for complex concrete situations that may involve constraints or call for making assumptions. They can select and integrate different representations, including symbolic, linking them directly to aspects of real-world situations. Students at this level can utilize their limited range of skills and can reason with some insight, in straightforward contexts. They can construct and communicate explanations and arguments based on their interpretations, arguments, and actions. |
| Level 3 482 | At level 3, students can execute clearly described procedures, including those that require sequential decisions. Their interpretations are sufficiently sound to be a base for building a simple model or for selecting and applying simple problem-solving strategies. Students at this level can interpret and use representations based on different information sources and reason directly from them. They typically show some ability to handle percentages, fractions and decimal numbers, and to work with proportional relationships. Their solutions reflect that they have engaged in basic interpretation and reasoning. |
| Level 2 420 | At level 2, students can interpret and recognize situations in contexts that require no more than direct inference. They can extract relevant information from a single source and make use of a single representational mode. Students at this level can employ basic algorithms, formulae, procedures, or conventions to solve problems involving whole numbers. They are capable of making literal interpretations of the results. |
| Level 1 358 | At level 1, students can answer questions involving familiar contexts where all relevant information is present and the questions are clearly defined. They are able to identify information and to carry out routine procedures according to direct instructions in explicit situations. They can perform actions that are almost always obvious and follow immediately from the given stimuli. |

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into mathematics literacy levels according to their scores. Cut scores in the exhibit are rounded; exact cut scores are provided in appendix A. Scores are reported on a scale from 0 to 1,000. SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Science Literacy

In PISA 2012, science literacy is defined as:

An individual's scientific knowledge and use of that knowledge to identify questions, to acquire new knowledge, to explain scientific phenomena, and to draw evidence based conclusions about science-related issues; understanding of the characteristic features of science as a form of human knowledge and inquiry; awareness of how science

and technology shape our material, intellectual, and cultural environments; and willingness to engage in science-related issues, and with the ideas of science, as a reflective citizen (OECD 2013a, p. 100).

Science literacy is reported both in terms of proficiency levels and scale scores (reported on a scale of 0–1,000). Exhibit 2 (see below) describes the six science literacy proficiency levels and their respective cut scores.

Exhibit 2. Description of PISA proficiency levels on science literacy scale: 2012

| Proficiency level and lower cut score | Task descriptions |
|---------------------------------------|---|
| Level 6 708 | At level 6, students can consistently identify, explain, and apply scientific knowledge and knowledge about science in a variety of complex life situations. They can link different information sources and explanations and use evidence from those sources to justify decisions. They clearly and consistently demonstrate advanced scientific thinking and reasoning, and they use their scientific understanding in support of solutions to unfamiliar scientific and technological situations. Students at this level can use scientific knowledge and develop arguments in support of recommendations and decisions that center on personal, social, or global situations. |
| Level 5 633 | At level 5, students can identify the scientific components of many complex life situations, apply both scientific concepts and knowledge about science to these situations, and can compare, select and evaluate appropriate scientific evidence for responding to life situations. Students at this level can use well-developed inquiry abilities, link knowledge appropriately, and bring critical insights to situations. They can construct explanations based on evidence and arguments based on their critical analysis. |
| Level 4 559 | At level 4, students can work effectively with situations and issues that may involve explicit phenomena requiring them to make inferences about the role of science or technology. They can select and integrate explanations from different disciplines of science or technology and link those explanations directly to aspects of life situations. Students at this level can reflect on their actions and they can communicate decisions using scientific knowledge and evidence. |
| Level 3 484 | At level 3, students can identify clearly described scientific issues in a range of contexts. They can select facts and knowledge to explain phenomena and apply simple models or inquiry strategies. Students at this level can interpret and use scientific concepts from different disciplines and can apply them directly. They can develop short statements using facts and make decisions based on scientific knowledge. |
| Level 2 410 | At level 2, students have adequate scientific knowledge to provide possible explanations in familiar contexts or draw conclusions based on simple investigations. They are capable of direct reasoning and making literal interpretations of the results of scientific inquiry or technological problem solving. |
| Level 1 335 | At level 1, students have such a limited scientific knowledge that it can only be applied to a few, familiar situations. They can present scientific explanations that are obvious and follow explicitly from given evidence. |

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into science literacy levels according to their scores. Cut scores in the exhibit are rounded; exact cut scores are provided in appendix A. Scores are reported on a scale from 0 to 1,000.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Reading Literacy

In PISA 2012, reading literacy is defined as:

Reading literacy is understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society (OECD 2013a, p. 61).

Reading literacy is reported both in terms of proficiency levels and scale scores (reported on a scale of 0–1,000). Exhibit 3 (see following page) describes the seven reading literacy proficiency levels and their respective cut scores.

Reporting PISA 2012 Results

This report presents performance on PISA 2012 in mathematics, science, and reading literacy from the perspective of Puerto Rico, which administered PISA in 2012 as a research study. Results are presented for the 66 education systems, including Puerto Rico, that participated in PISA 2012. Results are also presented for three U.S. states that participated under the U.S. PISA national center—Connecticut, Florida, and Massachusetts.

In this report, results are presented in terms of average scale scores and the percentage of 15-year-old students reaching each proficiency level. Results are also presented in terms of the performance of education systems at select percentiles. This report also presents average scale scores in terms of various indices. These indices include the economic, social, and cultural status (ESCS) index, an index of quality of schools' educational resources, and an index of quality of schools' physical infrastructure. Full descriptions of these indices can be found in appendix A.

In reporting PISA results, this report provides three main comparison groups for Puerto Rico—the OECD average, the Latin America average, and the United States. The OECD average is the average of all OECD member country averages with each country weighted equally. The Latin America average is the average of the eight Latin America participants in PISA with each country weighted equally. These countries include: Brazil, Colombia, Costa Rica, Argentina, Peru, Chile, Uruguay, and Mexico.

This report's tables and figures follow the OECD convention of placing OECD member countries and all other participating education systems in the main part of the tables and figures. These are all referred to as education systems in this report, and there are 66 altogether, including Puerto Rico. Results for the three U.S. states that participated under the U.S. PISA national center are presented in a separate part of the tables and figures. Connecticut, Florida, and Massachusetts are not included in counts of education systems performing above, below or not measurably different from Puerto Rico.

All statistically significant differences described in this report are at the .05 level. Differences that are statistically significant are discussed using comparative terms such as "higher" and "lower." Differences that are not statistically significant are either not discussed or referred to as "not measurably different." In almost all instances, the tests for significance used were standard *t* tests (see appendix A for additional details on interpreting statistical significance). No adjustments were made for multiple comparisons.



Exhibit 3. Description of PISA proficiency levels on reading literacy scale: 2012

| Proficiency level and lower cut score | Task descriptions |
|---------------------------------------|--|
| Level 6 698 | At level 6, tasks typically require the reader to make multiple inferences, comparisons, and contrasts that are both detailed and precise. They require demonstration of a full and detailed understanding of one or more texts and may involve integrating information from more than one text. Tasks may require the reader to deal with unfamiliar ideas, in the presence of prominent competing information, and to generate abstract categories for interpretations. Reflect and evaluate tasks may require the reader to hypothesize about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives, and applying sophisticated understandings from beyond the text. A salient condition for access and retrieve tasks at this level is precision of analysis and fine attention to detail that is inconspicuous in the texts. |
| Level 5 626 | At level 5, tasks that involve retrieving information require the reader to locate and organize several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypothesis, drawing on specialized knowledge. Both interpretative and reflective tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all aspects of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations. |
| Level 4 553 | At level 4, tasks that involve retrieving information require the reader to locate and organize several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances of language in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require readers to use formal or public knowledge to hypothesize about or critically evaluate a text. Readers must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar. |
| Level 3 480 | At level 3, tasks require the reader to locate, and in some cases recognize the relationship between, several pieces of information that must meet multiple conditions. Interpretative tasks at this level require the reader to integrate several parts of a text in order to identify a main idea, understand a relationship, or construe the meaning of a word or phrase. They need to take into account many features in comparing, contrasting or categorizing. Often the required information is not prominent or there is much competing information; or there are other text obstacles, such as ideas that are contrary to expectation or negatively worded. Reflective tasks at this level may require connections, comparisons, and explanations, or they may require the reader to evaluate a feature of the text. Some reflective tasks require readers to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but require the reader to draw on less common knowledge. |
| Level 2 407 | At level 2, some tasks require the reader to locate one or more pieces of information, which may need to be inferred and may need to meet several conditions. Others require recognizing the main idea in a text, understanding relationships, or construing meaning within a limited part of the text when the information is not prominent and the reader must make low level inferences. Tasks at this level may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require readers to make a comparison or several connections between the text and outside knowledge, by drawing on personal experience and attitudes. |
| Level 1a 335 | At level 1a, tasks require the reader to locate one or more independent pieces of explicitly stated information; to recognize the main theme or author's purpose in a text about a familiar topic, or to make a simple connection between information in the text and common, everyday knowledge. Typically, the required information in the text is prominent and there is little, if any, competing information. The reader is explicitly directed to consider relevant factors in the task and in the text. |
| Level 1b 262 | At level 1b, tasks require the reader to locate a single piece of explicitly stated information in a prominent position in a short, syntactically simple text with a familiar context and text type, such as a narrative or a simple list. The text typically provides support to the reader, such as repetition of information, pictures, or familiar symbols. There is minimal competing information. In tasks requiring interpretation the reader may need to make simple connections between adjacent pieces of information. |

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into reading literacy levels according to their scores. Cut scores in the exhibit are rounded; exact cut scores are provided in appendix A. Scores are reported on a scale from 0 to 1,000. SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Mathematics Performance in Puerto Rico and Internationally

Average Score

- ▶ Average scores ranged from 613 in Shanghai-China to 368 in Peru.
- ▶ The Puerto Rico average score was 382. This was lower than the OECD average, Latin America average, 58 education systems (including the

U.S.), and the 3 education systems under the U.S. PISA national center of Massachusetts, Connecticut, and Florida. The Puerto Rico average was higher than 1 education system (Peru) and not measurably different than 6 education systems, including Argentina, Colombia, Tunisia, Jordan, Qatar, and Indonesia.

Table 1. Average scores of 15-year-old students on PISA mathematics literacy scale, by education system: 2012

| Education system | Average score | Education system | Average score |
|---------------------------|---------------|--|---------------|
| OECD average | 494 ▲ | | |
| Latin America average | 397 ▲ | | |
| <i>Shanghai-China</i> | 613 ▲ | <i>Lithuania</i> | 479 ▲ |
| <i>Singapore</i> | 573 ▲ | Sweden | 478 ▲ |
| <i>Hong Kong-China</i> | 561 ▲ | Hungary | 477 ▲ |
| <i>Chinese Taipei</i> | 560 ▲ | <i>Croatia</i> | 471 ▲ |
| Korea, Republic of | 554 ▲ | Israel | 466 ▲ |
| <i>Macao-China</i> | 538 ▲ | Greece | 453 ▲ |
| Japan | 536 ▲ | <i>Serbia, Republic of</i> | 449 ▲ |
| <i>Liechtenstein</i> | 535 ▲ | Turkey | 448 ▲ |
| Switzerland | 531 ▲ | <i>Romania</i> | 445 ▲ |
| Netherlands | 523 ▲ | <i>Cyprus</i> | 440 ▲ |
| Estonia | 521 ▲ | <i>Bulgaria</i> | 439 ▲ |
| Finland | 519 ▲ | <i>United Arab Emirates</i> | 434 ▲ |
| Canada | 518 ▲ | <i>Kazakhstan</i> | 432 ▲ |
| Poland | 518 ▲ | <i>Thailand</i> | 427 ▲ |
| Belgium | 515 ▲ | Chile | 423 ▲ |
| Germany | 514 ▲ | <i>Malaysia</i> | 421 ▲ |
| <i>Vietnam</i> | 511 ▲ | Mexico | 413 ▲ |
| Austria | 506 ▲ | <i>Montenegro, Republic of</i> | 410 ▲ |
| Australia | 504 ▲ | <i>Uruguay</i> | 409 ▲ |
| Ireland | 501 ▲ | <i>Costa Rica</i> | 407 ▲ |
| Slovenia | 501 ▲ | <i>Albania</i> | 394 ▲ |
| Denmark | 500 ▲ | <i>Brazil</i> | 391 ▲ |
| New Zealand | 500 ▲ | <i>Argentina</i> | 388 |
| Czech Republic | 499 ▲ | <i>Tunisia</i> | 388 |
| France | 495 ▲ | <i>Jordan</i> | 386 |
| United Kingdom | 494 ▲ | Puerto Rico | 382 |
| Iceland | 493 ▲ | <i>Colombia</i> | 376 |
| <i>Latvia</i> | 491 ▲ | <i>Qatar</i> | 376 |
| Luxembourg | 490 ▲ | <i>Indonesia</i> | 375 |
| Norway | 489 ▲ | <i>Peru</i> | 368 ▼ |
| Portugal | 487 ▲ | | |
| Italy | 485 ▲ | Education systems under the U.S. PISA national center | |
| Spain | 484 ▲ | <i>Massachusetts</i> | 514 ▲ |
| <i>Russian Federation</i> | 482 ▲ | <i>Connecticut</i> | 506 ▲ |
| Slovak Republic | 482 ▲ | <i>Florida</i> | 467 ▲ |
| United States | 481 ▲ | | |

▲ Average score is higher than Puerto Rico average score.

▼ Average score is lower than Puerto Rico average score.

NOTE: Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Scores are reported on a scale from 0 to 1,000. All average scores reported as higher or lower than the Puerto Rico average score are different at the .05 level of statistical significance. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Average Score in Content Domains

- ▶ The Puerto Rico *quantity* subscale average score was 379; the Puerto Rico *uncertainty and data* subscale average score was 392; the Puerto Rico *change and relationships* subscale average score was 364; and the Puerto Rico *space and shape* subscale average score was 378.
- ▶ On each of the mathematics content subscales, the Puerto Rico average score was lower than the OECD average and the Latin America average. It was also lower than the United States and the 3 education systems under the U.S. PISA national center of Massachusetts, Connecticut, and Florida in all four subscales.
- ▶ Of the four content subscales, Puerto Rico had the most education systems scoring above it (60) on the *change and relationships* subscale. Puerto Rico had the fewest education systems scoring above it (57) on the *uncertainty and data* and the *space and shape* subscales.

Table 2. Average scores of 15-year-old students on PISA mathematics literacy content subscales, by education system: 2012

| Quantity | | Uncertainty and data | | Change and relationships | | Space and shape | |
|--|---------------|--|---------------|--|---------------|--|---------------|
| Education system | Average score | Education system | Average score | Education system | Average score | Education system | Average score |
| OECD average | 495 ▲ | OECD average | 493 ▲ | OECD average | 493 ▲ | OECD average | 490 ▲ |
| Latin America average | 397 ▲ | Latin America average | 402 ▲ | Latin America average | 384 ▲ | Latin America average | 393 ▲ |
| <i>Shanghai-China</i> | 591 ▲ | <i>Shanghai-China</i> | 592 ▲ | <i>Shanghai-China</i> | 624 ▲ | <i>Shanghai-China</i> | 649 ▲ |
| <i>Singapore</i> | 569 ▲ | <i>Singapore</i> | 559 ▲ | <i>Singapore</i> | 580 ▲ | <i>Chinese Taipei</i> | 592 ▲ |
| <i>Hong Kong-China</i> | 566 ▲ | <i>Hong Kong-China</i> | 553 ▲ | <i>Hong Kong-China</i> | 564 ▲ | <i>Singapore</i> | 580 ▲ |
| <i>Chinese Taipei</i> | 543 ▲ | <i>Chinese Taipei</i> | 549 ▲ | <i>Chinese Taipei</i> | 561 ▲ | Korea, Republic of | 573 ▲ |
| <i>Liechtenstein</i> | 538 ▲ | Korea, Republic of | 538 ▲ | Korea, Republic of | 559 ▲ | <i>Hong Kong-China</i> | 567 ▲ |
| Korea, Republic of | 537 ▲ | Netherlands | 532 ▲ | <i>Macao-China</i> | 542 ▲ | <i>Macao-China</i> | 558 ▲ |
| Netherlands | 532 ▲ | Japan | 528 ▲ | Japan | 542 ▲ | Japan | 558 ▲ |
| Switzerland | 531 ▲ | <i>Liechtenstein</i> | 526 ▲ | <i>Liechtenstein</i> | 542 ▲ | Switzerland | 544 ▲ |
| <i>Macao-China</i> | 531 ▲ | <i>Macao-China</i> | 525 ▲ | Estonia | 530 ▲ | <i>Liechtenstein</i> | 539 ▲ |
| Finland | 527 ▲ | Switzerland | 522 ▲ | Switzerland | 530 ▲ | Poland | 524 ▲ |
| Estonia | 525 ▲ | <i>Vietnam</i> | 519 ▲ | Canada | 525 ▲ | Estonia | 513 ▲ |
| Belgium | 519 ▲ | Finland | 519 ▲ | Finland | 520 ▲ | Canada | 510 ▲ |
| Poland | 519 ▲ | Poland | 517 ▲ | Netherlands | 518 ▲ | Belgium | 509 ▲ |
| Japan | 518 ▲ | Canada | 516 ▲ | Germany | 516 ▲ | Netherlands | 507 ▲ |
| Germany | 517 ▲ | Estonia | 510 ▲ | Belgium | 513 ▲ | Germany | 507 ▲ |
| Canada | 515 ▲ | Germany | 509 ▲ | <i>Vietnam</i> | 509 ▲ | <i>Vietnam</i> | 507 ▲ |
| Austria | 510 ▲ | Ireland | 509 ▲ | Poland | 509 ▲ | Finland | 507 ▲ |
| <i>Vietnam</i> | 509 ▲ | Belgium | 508 ▲ | Australia | 509 ▲ | Slovenia | 503 ▲ |
| Ireland | 505 ▲ | Australia | 508 ▲ | Austria | 506 ▲ | Austria | 501 ▲ |
| Czech Republic | 505 ▲ | New Zealand | 506 ▲ | Ireland | 501 ▲ | Czech Republic | 499 ▲ |
| Slovenia | 504 ▲ | Denmark | 505 ▲ | New Zealand | 501 ▲ | <i>Latvia</i> | 497 ▲ |
| Denmark | 502 ▲ | United Kingdom | 502 ▲ | Czech Republic | 499 ▲ | Denmark | 497 ▲ |
| Australia | 500 ▲ | Austria | 499 ▲ | Slovenia | 499 ▲ | Australia | 497 ▲ |
| New Zealand | 499 ▲ | Norway | 497 ▲ | France | 497 ▲ | <i>Russian Federation</i> | 496 ▲ |
| Iceland | 496 ▲ | Slovenia | 496 ▲ | <i>Latvia</i> | 496 ▲ | Portugal | 491 ▲ |
| France | 496 ▲ | Iceland | 496 ▲ | United Kingdom | 496 ▲ | New Zealand | 491 ▲ |
| Luxembourg | 495 ▲ | France | 492 ▲ | Denmark | 494 ▲ | Slovak Republic | 490 ▲ |
| United Kingdom | 494 ▲ | United States | 488 ▲ | <i>Russian Federation</i> | 491 ▲ | France | 489 ▲ |
| Norway | 492 ▲ | Czech Republic | 488 ▲ | United States | 488 ▲ | Iceland | 489 ▲ |
| Spain | 491 ▲ | Spain | 487 ▲ | Luxembourg | 488 ▲ | Italy | 487 ▲ |
| Italy | 491 ▲ | Portugal | 486 ▲ | Iceland | 487 ▲ | Luxembourg | 486 ▲ |
| <i>Latvia</i> | 487 ▲ | Luxembourg | 483 ▲ | Portugal | 486 ▲ | Norway | 480 ▲ |
| Slovak Republic | 486 ▲ | Sweden | 483 ▲ | Spain | 482 ▲ | Ireland | 478 ▲ |
| <i>Lithuania</i> | 483 ▲ | Italy | 482 ▲ | Hungary | 481 ▲ | Spain | 477 ▲ |
| Sweden | 482 ▲ | <i>Latvia</i> | 478 ▲ | <i>Lithuania</i> | 479 ▲ | United Kingdom | 475 ▲ |
| Portugal | 481 ▲ | Hungary | 476 ▲ | Norway | 478 ▲ | Hungary | 474 ▲ |
| <i>Croatia</i> | 480 ▲ | <i>Lithuania</i> | 474 ▲ | Italy | 477 ▲ | <i>Lithuania</i> | 472 ▲ |
| Israel | 480 ▲ | Slovak Republic | 472 ▲ | Slovak Republic | 474 ▲ | Sweden | 469 ▲ |
| United States | 478 ▲ | <i>Croatia</i> | 468 ▲ | Sweden | 469 ▲ | United States | 463 ▲ |
| <i>Russian Federation</i> | 478 ▲ | Israel | 465 ▲ | <i>Croatia</i> | 468 ▲ | <i>Croatia</i> | 460 ▲ |
| Hungary | 476 ▲ | <i>Russian Federation</i> | 463 ▲ | Israel | 462 ▲ | <i>Kazakhstan</i> | 450 ▲ |
| <i>Serbia, Republic of</i> | 456 ▲ | Greece | 460 ▲ | Turkey | 448 ▲ | Israel | 449 ▲ |
| Greece | 455 ▲ | <i>Serbia, Republic of</i> | 448 ▲ | Greece | 446 ▲ | <i>Romania</i> | 447 ▲ |
| <i>Romania</i> | 443 ▲ | Turkey | 447 ▲ | <i>Romania</i> | 446 ▲ | <i>Serbia, Republic of</i> | 446 ▲ |
| <i>Bulgaria</i> | 443 ▲ | Cyprus | 442 ▲ | <i>United Arab Emirates</i> | 442 ▲ | Turkey | 443 ▲ |
| Turkey | 442 ▲ | <i>Romania</i> | 437 ▲ | <i>Serbia, Republic of</i> | 442 ▲ | <i>Bulgaria</i> | 442 ▲ |
| Cyprus | 439 ▲ | <i>Thailand</i> | 433 ▲ | Cyprus | 440 ▲ | Greece | 436 ▲ |
| <i>United Arab Emirates</i> | 431 ▲ | <i>United Arab Emirates</i> | 432 ▲ | <i>Bulgaria</i> | 434 ▲ | Cyprus | 436 ▲ |
| <i>Kazakhstan</i> | 428 ▲ | <i>Bulgaria</i> | 432 ▲ | <i>Kazakhstan</i> | 433 ▲ | <i>Malaysia</i> | 434 ▲ |
| Chile | 421 ▲ | Chile | 430 ▲ | <i>Thailand</i> | 414 ▲ | <i>Thailand</i> | 432 ▲ |
| <i>Thailand</i> | 419 ▲ | <i>Malaysia</i> | 422 ▲ | Chile | 411 ▲ | <i>United Arab Emirates</i> | 425 ▲ |
| Mexico | 414 ▲ | <i>Montenegro, Republic of</i> | 415 ▲ | Mexico | 405 ▲ | Chile | 419 ▲ |
| Uruguay | 411 ▲ | <i>Costa Rica</i> | 414 ▲ | <i>Costa Rica</i> | 402 ▲ | <i>Albania</i> | 418 ▲ |
| <i>Malaysia</i> | 409 ▲ | <i>Kazakhstan</i> | 414 ▲ | Uruguay | 401 ▲ | Uruguay | 413 ▲ |
| <i>Montenegro, Republic of</i> | 409 ▲ | Mexico | 413 ▲ | <i>Malaysia</i> | 401 ▲ | Mexico | 413 ▲ |
| <i>Costa Rica</i> | 406 ▲ | Uruguay | 407 ▲ | <i>Montenegro, Republic of</i> | 399 ▲ | <i>Montenegro, Republic of</i> | 412 ▲ |
| Brazil | 393 ▲ | Brazil | 402 ▲ | <i>Albania</i> | 388 ▲ | <i>Costa Rica</i> | 397 ▲ |
| Argentina | 391 ▲ | Tunisia | 399 | Jordan | 387 | Jordan | 385 |
| Albania | 386 | Jordan | 394 | Tunisia | 379 | Argentina | 385 |
| Puerto Rico | 379 | Puerto Rico | 392 | Argentina | 379 | Indonesia | 383 |
| Tunisia | 378 | Argentina | 389 | Brazil | 372 | Tunisia | 382 |
| Colombia | 375 | Colombia | 388 | Indonesia | 364 | Brazil | 381 |
| Qatar | 371 | Albania | 386 | Puerto Rico | 364 | Qatar | 380 |
| Jordan | 367 ▼ | Indonesia | 384 | Qatar | 363 | Puerto Rico | 378 |
| Peru | 365 ▼ | Qatar | 382 | Colombia | 357 | Peru | 370 |
| Indonesia | 362 ▼ | Peru | 373 ▼ | Peru | 349 ▼ | Colombia | 369 |
| Education systems under the U.S. PISA national center | | Education systems under the U.S. PISA national center | | Education systems under the U.S. PISA national center | | Education systems under the U.S. PISA national center | |
| Massachusetts | 506 ▲ | Massachusetts | 523 ▲ | Massachusetts | 518 ▲ | Massachusetts | 498 ▲ |
| Connecticut | 502 ▲ | Connecticut | 512 ▲ | Connecticut | 515 ▲ | Connecticut | 487 ▲ |
| Florida | 458 ▲ | Florida | 475 ▲ | Florida | 476 ▲ | Florida | 446 ▲ |

▲ Average score is higher than Puerto Rico average score.
▼ Average score is lower than Puerto Rico average score.

NOTE: Education systems are ordered by 2012 average subscale score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Scores are reported on a scale from 0 to 1,000. All average scores reported as higher or lower than the Puerto Rico average score are different at the .05 significance level of statistical significance. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Performance at Mathematics Literacy Proficiency Levels

- ▶ Nearly all students in Puerto Rico scored at proficiency levels 3 or below.
- ▶ The percentage of Puerto Rico students scoring at proficiency level 3 was lower than the OECD average, Latin America average, and the U.S. average.
- ▶ The percentage of Puerto Rico students scoring at proficiency level 2 was lower than the U.S. percentage but not measurably different than the OECD average or Latin America average percentages.
- ▶ The percentage of Puerto Rico students scoring at proficiency level 1 was higher than the OECD average, Latin America average, and U.S. percentages; below proficiency level 1, the percentage of Puerto Rico students was higher than the OECD average and U.S. percentages but not measurably different than the Latin America average percentage.

Table 3. Percentage distribution of 15-year-old students on PISA mathematics literacy scale, by proficiency level and education system: 2012

| Education system | Percent | | | | | | |
|--|---------------|-------------|-------------|------------|----------|----------|----------|
| | Below level 1 | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Level 6 |
| OECD average | 8.0* | 15.0* | 22.5 | 23.7* | 18.1 | 9.3 | 3.3 |
| Latin America average | 32.0 | 30.9* | 22.5 | 10.5* | 3.3 | 0.7 | 0.1 |
| <i>Albania</i> | 32.5 | 28.1* | 22.9 | 12.0* | 3.6 | 0.8 | ‡ |
| <i>Argentina</i> | 34.9 | 31.6* | 22.2 | 9.2* | 1.8 | 0.3! | ‡ |
| Australia | 6.1* | 13.5* | 21.9 | 24.6* | 19.0 | 10.5 | 4.3 |
| Austria | 5.7* | 13.0* | 21.9 | 24.2* | 21.0 | 11.0 | 3.3 |
| Belgium | 7.0* | 12.0* | 18.4 | 22.4* | 20.6 | 13.4 | 6.1 |
| <i>Brazil</i> | 35.2 | 31.9* | 20.4 | 8.9* | 2.9 | 0.7 | ‡ |
| <i>Bulgaria</i> | 20.0* | 23.8* | 24.4 | 17.9* | 9.9 | 3.4 | 0.7 |
| Canada | 3.6* | 10.2* | 21.0 | 26.4* | 22.4 | 12.1 | 4.3 |
| Chile | 22.0* | 29.5* | 25.3* | 15.4* | 6.2 | 1.5 | 0.1! |
| <i>Chinese Taipei</i> | 4.5* | 8.3* | 13.1* | 17.1* | 19.7 | 19.2 | 18.0 |
| <i>Colombia</i> | 41.6* | 32.2* | 17.8 | 6.4 | 1.6 | 0.3! | ‡ |
| <i>Costa Rica</i> | 23.6* | 36.2 | 26.8* | 10.1* | 2.6 | 0.5! | ‡ |
| <i>Croatia</i> | 9.5* | 20.4* | 26.7* | 22.9* | 13.5 | 5.4 | 1.6! |
| <i>Cyprus</i> | 19.0* | 23.0* | 25.5* | 19.2* | 9.6 | 3.1 | 0.6! |
| Czech Republic | 6.8* | 14.2* | 21.7 | 24.8* | 19.7 | 9.6 | 3.2 |
| Denmark | 4.4* | 12.5* | 24.4 | 29.0* | 19.8 | 8.3 | 1.7 |
| Estonia | 2.0* | 8.6* | 22.0 | 29.4* | 23.4 | 11.0 | 3.6 |
| Finland | 3.3* | 8.9* | 20.5 | 28.8* | 23.2 | 11.7 | 3.5 |
| France | 8.7* | 13.6* | 22.1 | 23.8* | 18.9 | 9.8 | 3.1 |
| Germany | 5.5* | 12.2* | 19.4 | 23.7* | 21.7 | 12.8 | 4.7 |
| Greece | 14.5* | 21.2* | 27.2* | 22.1* | 11.2 | 3.3 | 0.6 |
| <i>Hong Kong-China</i> | 2.6* | 5.9* | 12.0* | 19.7* | 26.1 | 21.4 | 12.3 |
| Hungary | 9.9* | 18.2* | 25.3* | 23.0* | 14.4 | 7.1 | 2.1 |
| Iceland | 7.5* | 14.0* | 23.6 | 25.7* | 18.1 | 8.9 | 2.3 |
| <i>Indonesia</i> | 42.3* | 33.4* | 16.8 | 5.7 | 1.5! | ‡ | ‡ |
| Ireland | 4.8* | 12.1* | 23.9 | 28.2* | 20.3 | 8.5 | 2.2 |
| Israel | 15.9* | 17.6* | 21.6 | 21.0* | 14.6 | 7.2 | 2.2 |
| Italy | 8.5* | 16.1* | 24.1 | 24.6* | 16.7 | 7.8 | 2.2 |
| Japan | 3.2* | 7.9* | 16.9 | 24.7* | 23.7 | 16.0 | 7.6 |
| <i>Jordan</i> | 36.5 | 32.1* | 21.0 | 8.1* | 1.8 | ‡ | ‡ |
| <i>Kazakhstan</i> | 14.5* | 30.7* | 31.5* | 16.9* | 5.4 | 0.9! | ‡ |
| Korea, Republic of | 2.7* | 6.4* | 14.7* | 21.4* | 23.9 | 18.8 | 12.1 |
| <i>Latvia</i> | 4.8* | 15.1* | 26.6* | 27.8* | 17.6 | 6.5 | 1.5 |
| <i>Liechtenstein</i> | 3.5!* | 10.6* | 15.2 | 22.7* | 23.2 | 17.4 | 7.4 |
| <i>Lithuania</i> | 8.7* | 17.3* | 25.9* | 24.6* | 15.4 | 6.6 | 1.4 |
| Luxembourg | 8.8* | 15.5* | 22.3 | 23.6* | 18.5 | 8.6 | 2.6 |
| <i>Macao-China</i> | 3.2* | 7.6* | 16.4* | 24.0* | 24.4 | 16.8 | 7.6 |
| <i>Malaysia</i> | 23.0* | 28.8* | 26.0* | 14.9* | 6.0 | 1.2 | 0.1! |
| Mexico | 22.8* | 31.9* | 27.8* | 13.1* | 3.7 | 0.6 | ‡ |
| <i>Montenegro, Republic of</i> | 27.5* | 29.1* | 24.2 | 13.1* | 4.9 | 0.9 | ‡ |
| Netherlands | 3.8* | 11.0* | 17.9 | 24.2* | 23.8 | 14.9 | 4.4 |
| New Zealand | 7.5* | 15.1* | 21.6 | 22.7* | 18.1 | 10.5 | 4.5 |
| Norway | 7.2* | 15.1* | 24.3 | 25.7* | 18.3 | 7.3 | 2.1 |
| <i>Peru</i> | 47.0* | 27.6* | 16.1* | 6.7 | 2.1 | 0.5! | ‡ |
| Poland | 3.3* | 11.1* | 22.1 | 25.5* | 21.3 | 11.7 | 5.0 |
| Portugal | 8.9* | 16.0* | 22.8 | 24.0* | 17.7 | 8.5 | 2.1 |
| Puerto Rico | 34.2 | 39.8 | 20.6 | 4.6 | ‡ | ‡ | ‡ |
| <i>Qatar</i> | 47.0* | 22.6* | 15.2* | 8.8* | 4.5 | 1.7 | 0.3 |
| <i>Romania</i> | 14.0* | 26.8* | 28.3* | 19.2* | 8.4 | 2.6 | 0.6! |
| <i>Russian Federation</i> | 7.5* | 16.5* | 26.6* | 26.0* | 15.7 | 6.3 | 1.5 |
| <i>Serbia, Republic of</i> | 15.5* | 23.4* | 26.5* | 19.5* | 10.5 | 3.5 | 1.1 |
| <i>Shanghai-China</i> | 0.8* | 2.9* | 7.5* | 13.1* | 20.2 | 24.6 | 30.8 |
| <i>Singapore</i> | 2.2* | 6.1* | 12.2* | 17.5* | 22.0 | 21.0 | 19.0 |
| Slovak Republic | 11.1* | 16.4* | 23.1 | 22.1* | 16.4 | 7.8 | 3.1 |
| Slovenia | 5.1* | 15.0* | 23.6 | 23.9* | 18.7 | 10.3 | 3.4 |
| Spain | 7.8* | 15.8* | 24.9* | 26.0* | 17.6 | 6.7 | 1.3 |
| Sweden | 9.5* | 17.5* | 24.7* | 23.9* | 16.3 | 6.5 | 1.6 |
| Switzerland | 3.6* | 8.9* | 17.8 | 24.5* | 23.9 | 14.6 | 6.8 |
| <i>Thailand</i> | 19.1* | 30.6* | 27.3* | 14.5* | 5.8 | 2.0 | 0.5! |
| <i>Tunisia</i> | 36.5 | 31.3* | 21.1 | 8.0* | 2.3 | 0.7! | ‡ |
| Turkey | 15.5* | 26.5* | 25.5* | 16.5* | 10.1 | 4.7 | 1.2! |
| <i>United Arab Emirates</i> | 20.5* | 25.8* | 24.9* | 16.9* | 8.5 | 2.9 | 0.5 |
| United Kingdom | 7.8* | 14.0* | 23.2 | 24.8* | 18.4 | 9.0 | 2.9 |
| United States | 8.0* | 17.9* | 26.3* | 23.3* | 15.8 | 6.6 | 2.2 |
| <i>Uruguay</i> | 29.2 | 26.5* | 23.0 | 14.4* | 5.4 | 1.3 | ‡ |
| <i>Vietnam</i> | 3.6* | 10.6* | 22.8 | 28.4* | 21.3 | 9.8 | 3.5 |
| Education systems under the U.S. PISA national center | | | | | | | |
| <i>Connecticut</i> | 6.8* | 13.8* | 20.0 | 24.3* | 18.6 | 11.5 | 4.9 |
| <i>Florida</i> | 9.7* | 20.6* | 27.9* | 23.0* | 13.0 | 4.9 | 0.9! |
| <i>Massachusetts</i> | 5.3* | 12.5* | 20.4 | 24.3* | 18.9 | 12.7 | 5.8 |

! Interpret data with caution. Estimate is unstable due to high coefficient of variation.

‡ Reporting standards not met.

* p < .05. Significantly different from the Puerto Rico percentage at the .05 level of statistical significance.

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into mathematics literacy levels according to their scores. Exact cut scores are as follows: below level 1 (a score less than or equal to 357.77); level 1 (a score greater than 357.77 and less than or equal to 420.07); level 2 (a score greater than 420.07 and less than or equal to 482.38); level 3 (a score greater than 482.38 and less than or equal to 544.68); level 4 (a score greater than 544.68 and less than or equal to 606.99); level 5 (a score greater than 606.99 and less than or equal to 669.30); and level 6 (a score greater than 669.30). Scores are reported on a scale from 0 to 1,000. The OECD average is the average of the national percentages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national percentages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Detail may not sum to totals because of rounding. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Performance at Proficiency Levels in Content Domains

- ▶ Overall, students in Puerto Rico found the *change and relationships* subscale particularly challenging; 47.8 percent of students scored below proficiency level 1 on the *change and relationships* subscale. In comparison, students did better on the *uncertainty and data* subscale where 29 percent of students scored below proficiency level 1. This pattern held true for Latin America countries on average; 39.6 percent of students scored below proficiency level 1 on the *change and relationships* subscale while 27.4 percent of students scored below proficiency level 1 on the *uncertainty and data* subscale in Latin America countries on average.
- ▶ For the *quantity* subscale, the percentages of Puerto Rico students at proficiency levels 3 and 4 were lower than the OECD average, Latin America average, and U.S. percentages.
- ▶ The percentage of Puerto Rico students at proficiency level 2 was lower than the U.S. percentage but not measurably different than the OECD average or Latin America percentages.
- ▶ The percentage of Puerto Rico students at proficiency level 1 was higher than the OECD average, Latin America average, and U.S. percentages; below proficiency level 1, the percentage of Puerto Rico students was higher than the OECD average and U.S. percentages but not measurably different than the Latin America average percentage.
- ▶ For the *uncertainty* subscale, the percentage of Puerto Rico students at proficiency level 3 was lower than the OECD average, Latin America average, and U.S. percentages.
- ▶ The percentage of Puerto Rico students at proficiency level 2 was not measurably different than the OECD average, Latin America average, and U.S. percentages. However, the percentage of Puerto Rico students at proficiency level 1 was higher than the OECD average, Latin America average, and U.S. percentages.
- ▶ The percentage of Puerto Rico students below proficiency level 1 was higher than the OECD average and U.S. percentages but not measurably different than the Latin America average percentage.
- ▶ For the *change and relationships* subscale, the percentages of Puerto Rico students at proficiency levels 2, 3, and 4 were lower than the OECD average, Latin America average, and U.S. percentages.
- ▶ The percentage of Puerto Rico students at proficiency level 1 was higher than the OECD average and U.S. percentages but not measurably different than the Latin America average percentage.
- ▶ The percentage of Puerto Rico students below proficiency level 1 was higher than the OECD average, Latin America average, and U.S. percentages.
- ▶ For the *space and shape* subscale, the percentage of Puerto Rico students at proficiency level 3 was lower than the OECD average, Latin America average, and U.S. percentages.
- ▶ The percentage of Puerto Rico students at proficiency level 2 was lower than the U.S. percentage but not measurably different than the OECD average and Latin America average percentages.
- ▶ The percentage of Puerto Rico students at proficiency level 1 was higher than the OECD average, Latin America average, and U.S. percentages. The percentage of Puerto Rico students below proficiency level 1 was higher than the OECD average and U.S. percentages but not measurably different than the Latin America average percentage.

Table 4. Percentage distribution of 15-year-old students on PISA mathematics literacy content subscales, by proficiency level and education system: 2012

| Education system | Quantity | | | | | | |
|--|---------------|-------------|-------------|------------|-------------|----------|----------|
| | Below level 1 | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Level 6 |
| OECD average | 9.2* | 14.3* | 21.1 | 22.9* | 18.5* | 10.1 | 3.9 |
| Latin America average | 33.6 | 27.2* | 21.8 | 11.6* | 4.5* | 1.2 | 0.2 |
| <i>Albania</i> | 36.4 | 26.2* | 21.2 | 11.4* | 3.9* | 0.8 | ‡ |
| <i>Argentina</i> | 34.0 | 29.4* | 22.9 | 10.5* | 2.6* | 0.5 | ‡ |
| <i>Australia</i> | 8.4* | 13.8* | 21.2 | 22.8* | 18.3* | 10.5 | 4.9 |
| <i>Austria</i> | 5.0* | 12.4* | 20.9 | 24.6* | 22.3* | 11.3 | 3.5 |
| <i>Belgium</i> | 6.9* | 11.2* | 17.9 | 21.8* | 21.2* | 14.5 | 6.6 |
| <i>Brazil</i> | 36.5 | 27.0* | 20.2 | 10.5* | 4.3* | 1.3 | 0.2! |
| <i>Bulgaria</i> | 20.2* | 21.7* | 23.4 | 18.2* | 10.9* | 4.3 | 1.2 |
| <i>Canada</i> | 5.9* | 11.0* | 19.7 | 24.2* | 20.9* | 12.6 | 5.8 |
| <i>Chile</i> | 24.6* | 26.7* | 23.9* | 15.5* | 7.1* | 1.9 | 0.3 |
| <i>Chinese Taipei</i> | 5.1* | 9.2* | 14.0* | 19.3* | 22.1* | 18.7 | 11.6 |
| <i>Colombia</i> | 43.1 | 27.2* | 18.0 | 8.3 | 2.7* | 0.6 | 0.1! |
| <i>Costa Rica</i> | 27.2* | 30.8 | 25.8* | 11.3* | 3.9* | 0.9! | ‡ |
| <i>Croatia</i> | 9.1* | 18.0* | 24.9* | 23.4* | 15.3* | 7.0 | 2.3 |
| <i>Cyprus</i> | 21.6* | 21.2* | 23.8* | 18.5* | 10.3* | 3.7 | 0.9 |
| <i>Czech Republic</i> | 7.7* | 12.4* | 20.6 | 23.5* | 19.8* | 11.0 | 4.9 |
| <i>Denmark</i> | 5.5* | 12.9* | 22.9 | 26.1* | 20.0* | 9.7 | 2.9 |
| <i>Estonia</i> | 2.7* | 8.5* | 19.8 | 27.8* | 24.0* | 12.4 | 4.7 |
| <i>Finland</i> | 2.9* | 8.1* | 19.3 | 27.7* | 24.3* | 12.7 | 5.0 |
| <i>France</i> | 9.4* | 14.1* | 20.7 | 22.3* | 18.9* | 10.7 | 4.0 |
| <i>Germany</i> | 6.1* | 11.6* | 17.7 | 23.4* | 22.1* | 13.5 | 5.6 |
| <i>Greece</i> | 16.4* | 19.3* | 24.4* | 21.5* | 12.7* | 4.5 | 1.1 |
| <i>Hong Kong-China</i> | 3.3* | 5.3* | 11.4* | 18.6* | 24.6* | 22.1 | 14.6 |
| <i>Hungary</i> | 11.7* | 18.1* | 23.5 | 21.6* | 15.3* | 7.5 | 2.4 |
| <i>Iceland</i> | 9.3* | 13.3* | 20.8 | 24.1* | 18.5* | 10.2 | 3.9 |
| <i>Indonesia</i> | 50.0* | 27.1* | 14.8* | 5.8 | 2.0! | ‡ | ‡ |
| <i>Ireland</i> | 5.9* | 12.0* | 21.8 | 26.0* | 20.6* | 10.4 | 3.3 |
| <i>Israel</i> | 15.6* | 15.2* | 19.1 | 19.8* | 16.2* | 9.4 | 4.8 |
| <i>Italy</i> | 9.6* | 14.6* | 21.7 | 23.6* | 18.0* | 9.2 | 3.3 |
| <i>Japan</i> | 4.9* | 10.3* | 19.5 | 25.2* | 22.3* | 12.7 | 5.1 |
| <i>Jordan</i> | 47.2* | 26.0* | 16.7* | 7.4 | 2.1* | 0.6! | ‡ |
| <i>Kazakhstan</i> | 18.5* | 29.5* | 28.1* | 16.1* | 6.2* | 1.4 | 0.2! |
| <i>Korea, Republic of</i> | 3.4* | 7.4* | 16.2* | 23.9* | 25.1* | 17.1 | 6.8 |
| <i>Latvia</i> | 5.9* | 15.4* | 26.5* | 26.6* | 17.8* | 6.5 | 1.2 |
| <i>Liechtenstein</i> | 4.6* | 8.2* | 16.6 | 19.1* | 23.1* | 19.9 | 8.4 |
| <i>Lithuania</i> | 9.1* | 16.1* | 25.1* | 24.1* | 16.0* | 7.4 | 2.2 |
| <i>Luxembourg</i> | 9.2* | 14.5* | 20.8 | 22.8* | 19.3* | 9.8 | 3.6 |
| <i>Macao-China</i> | 3.4* | 8.4* | 17.7 | 24.6* | 25.0* | 15.0 | 5.8 |
| <i>Malaysia</i> | 30.4* | 26.0* | 21.9 | 13.1* | 6.4* | 1.9 | 0.3! |
| <i>Mexico</i> | 25.9* | 27.5* | 25.3* | 14.5* | 5.4* | 1.3 | 0.2 |
| <i>Montenegro, Republic of</i> | 28.5* | 27.5* | 23.8 | 13.7* | 4.9* | 1.3 | ‡ |
| <i>Netherlands</i> | 4.2* | 10.3* | 16.4* | 21.3* | 24.0* | 16.9 | 6.9 |
| <i>New Zealand</i> | 8.8* | 14.6* | 21.0 | 21.9* | 18.0* | 10.8 | 4.8 |
| <i>Norway</i> | 7.8* | 14.2* | 23.3 | 25.6* | 18.0* | 8.1 | 3.0 |
| <i>Peru</i> | 47.9* | 24.8* | 15.9* | 7.5 | 2.9* | 0.9! | ‡ |
| <i>Poland</i> | 3.1* | 10.5* | 21.1 | 26.9* | 21.6* | 12.2 | 4.4 |
| <i>Portugal</i> | 10.4* | 16.4* | 23.0 | 23.5* | 17.2* | 7.5 | 2.0 |
| Puerto Rico | 37.8 | 34.0 | 20.3 | 6.9 | 0.9! | ‡ | ‡ |
| <i>Qatar</i> | 48.5* | 21.6* | 14.8* | 8.8 | 4.4* | 1.6 | 0.3 |
| <i>Romania</i> | 18.5* | 24.1* | 24.8* | 18.3* | 9.5* | 3.7 | 1.1! |
| <i>Russian Federation</i> | 9.6* | 16.7* | 25.9* | 24.4* | 15.0* | 6.6 | 1.9 |
| <i>Serbia, Republic of</i> | 15.4* | 21.2* | 25.2* | 19.9* | 11.8* | 4.8 | 1.6 |
| <i>Shanghai-China</i> | 1.3* | 3.7* | 8.8* | 16.3* | 23.7* | 25.3 | 20.9 |
| <i>Singapore</i> | 2.5* | 6.3* | 11.9* | 18.5* | 23.3* | 20.5 | 16.9 |
| <i>Slovak Republic</i> | 11.4* | 15.5* | 21.6 | 21.6* | 17.0* | 9.0 | 3.9 |
| <i>Slovenia</i> | 6.0* | 13.3* | 22.7 | 24.1* | 19.2* | 10.7 | 4.1 |
| <i>Spain</i> | 9.7* | 14.3* | 21.4 | 23.7* | 18.5* | 9.2 | 3.2 |
| <i>Sweden</i> | 10.2* | 15.9* | 23.5 | 23.9* | 16.6* | 7.5 | 2.4 |
| <i>Switzerland</i> | 4.0* | 8.9* | 17.3 | 23.7* | 23.9* | 15.0 | 7.1 |
| <i>Thailand</i> | 24.6* | 28.5* | 24.9* | 13.8* | 5.8* | 2.0 | 0.4! |
| <i>Tunisia</i> | 42.4 | 26.4* | 19.0 | 8.4 | 2.8* | 0.7! | ‡ |
| <i>Turkey</i> | 19.6* | 24.8* | 23.3 | 16.4* | 10.1* | 4.8 | 1.0! |
| <i>United Arab Emirates</i> | 24.3* | 22.9* | 22.3 | 16.4* | 9.4* | 3.6 | 1.0 |
| <i>United Kingdom</i> | 9.4* | 14.3* | 21.2 | 23.0* | 18.4* | 9.8 | 3.8 |
| <i>United States</i> | 10.9* | 18.3* | 24.0* | 21.5* | 14.7* | 7.6 | 3.0 |
| <i>Uruguay</i> | 29.9* | 24.0* | 22.3 | 14.7* | 6.8* | 2.0 | 0.3! |
| <i>Vietnam</i> | 5.4* | 11.2* | 22.4 | 26.1* | 20.3* | 10.5 | 4.2 |
| Education systems under the U.S. PISA national center | | | | | | | |
| <i>Connecticut</i> | 9.4* | 13.5* | 19.2 | 22.0* | 19.4* | 11.5 | 5.1 |
| <i>Florida</i> | 14.6* | 20.8* | 25.1* | 21.4* | 12.1* | 4.9 | 1.1! |
| <i>Massachusetts</i> | 7.9* | 12.6* | 19.9 | 23.7* | 18.5* | 11.8 | 5.6 |

See notes at end of table.

Table 4. Percentage distribution of 15-year-old students on PISA mathematics literacy content subscales, by proficiency level and education system: 2012 (continued)

| Education system | Uncertainty and data | | | | | | |
|--|----------------------|-------------|-------------|------------|----------|----------|----------|
| | Percent | | | | | | |
| | Below level 1 | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Level 6 |
| OECD average | 8.3* | 14.7* | 22.5 | 23.8* | 18.1 | 9.2 | 3.3 |
| Latin America average | 27.4 | 33.1* | 25.5 | 10.7* | 2.8 | 0.4 | #! |
| <i>Albania</i> | 36.3* | 27.0* | 21.6* | 10.9* | 3.5 | 0.7 | ‡ |
| <i>Argentina</i> | 35.0* | 30.0* | 22.8 | 9.7* | 2.2 | 0.4 | ‡ |
| <i>Australia</i> | 6.0* | 12.5* | 21.4* | 24.6* | 19.8 | 11.1 | 4.6 |
| <i>Austria</i> | 7.3* | 13.8* | 21.4* | 24.1* | 20.9 | 9.7 | 2.8 |
| <i>Belgium</i> | 8.8* | 12.0* | 19.1* | 21.8* | 19.2 | 12.5 | 6.5 |
| <i>Brazil</i> | 26.5 | 35.1 | 25.5 | 10.0* | 2.5 | 0.3! | ‡ |
| <i>Bulgaria</i> | 20.7* | 24.8* | 25.8 | 18.0* | 8.1 | 2.3 | 0.3! |
| <i>Canada</i> | 4.1* | 10.1* | 20.9* | 26.8* | 21.9 | 12.1 | 4.0 |
| <i>Chile</i> | 16.8* | 29.4* | 29.3* | 17.1* | 6.2 | 1.1 | 0.1! |
| <i>Chinese Taipei</i> | 4.4* | 8.6* | 14.4* | 19.2* | 21.5 | 18.7 | 13.1 |
| <i>Colombia</i> | 32.4 | 36.8 | 23.0 | 6.6 | 1.2 | 0.1! | ‡ |
| <i>Costa Rica</i> | 17.8* | 37.1 | 31.1* | 11.8* | 2.1 | ‡ | ‡ |
| <i>Croatia</i> | 10.8* | 19.8* | 26.4 | 22.6* | 13.6 | 5.3 | 1.4 |
| <i>Cyprus</i> | 17.5* | 22.2* | 26.9 | 20.8* | 9.5 | 2.7 | 0.4! |
| <i>Czech Republic</i> | 7.7* | 15.1* | 24.5 | 25.2* | 17.5 | 7.7 | 2.2 |
| <i>Denmark</i> | 4.5* | 11.6* | 23.3 | 27.8* | 21.2 | 9.4 | 2.3 |
| <i>Estonia</i> | 2.9* | 10.1* | 23.8 | 29.7* | 21.7 | 9.3 | 2.5 |
| <i>Finland</i> | 4.2* | 9.5* | 19.7* | 27.4* | 22.9 | 11.9 | 4.4 |
| <i>France</i> | 10.5* | 14.1* | 20.3* | 22.6* | 19.5 | 9.8 | 3.2 |
| <i>Germany</i> | 7.2* | 12.3* | 19.9* | 22.9* | 20.4 | 12.4 | 5.0 |
| <i>Greece</i> | 12.3* | 19.4* | 27.5 | 24.2* | 12.2 | 3.8 | 0.7 |
| <i>Hong Kong-China</i> | 2.3* | 6.0* | 13.2* | 22.5* | 26.9 | 20.0 | 9.2 |
| <i>Hungary</i> | 10.9* | 16.9* | 25.2 | 23.1* | 15.4 | 6.9 | 1.7 |
| <i>Iceland</i> | 8.8* | 13.2* | 21.2* | 24.5* | 19.5 | 9.8 | 3.1 |
| <i>Indonesia</i> | 35.7* | 36.1 | 20.4* | 6.2 | 1.3! | ‡ | ‡ |
| <i>Ireland</i> | 4.7* | 11.1* | 21.3* | 27.7* | 22.2 | 10.1 | 2.8 |
| <i>Israel</i> | 16.7* | 16.9* | 21.4* | 20.9* | 14.3 | 7.1 | 2.6 |
| <i>Italy</i> | 9.8* | 15.9* | 23.5 | 24.3* | 16.8 | 7.5 | 2.1 |
| <i>Japan</i> | 3.2* | 8.7* | 18.0* | 26.2* | 24.2 | 14.5 | 5.2 |
| <i>Jordan</i> | 30.3 | 33.6* | 24.3 | 9.4* | 1.8 | ‡ | ‡ |
| <i>Kazakhstan</i> | 17.1* | 37.4 | 33.1* | 11.1* | 1.3 | ‡ | ‡ |
| <i>Korea, Republic of</i> | 3.6* | 7.6* | 16.7* | 23.6* | 23.8 | 16.4 | 8.3 |
| <i>Latvia</i> | 6.1* | 17.5* | 28.3 | 27.6* | 15.4 | 4.3 | 0.7 |
| <i>Liechtenstein</i> | 5.0* | 9.9* | 18.1* | 22.2* | 22.7 | 15.4 | 6.7 |
| <i>Lithuania</i> | 10.1* | 17.9* | 26.2 | 23.8* | 14.6 | 6.1 | 1.4 |
| <i>Luxembourg</i> | 11.2* | 16.7* | 21.6* | 22.0* | 17.4 | 8.4 | 2.7 |
| <i>Macao-China</i> | 3.5* | 8.5* | 18.7* | 26.3* | 24.8 | 13.7 | 4.5 |
| <i>Malaysia</i> | 21.6* | 27.6* | 28.4 | 15.8* | 5.5 | 1.1 | ‡ |
| <i>Mexico</i> | 20.2* | 34.4 | 30.4* | 12.3* | 2.4 | 0.2 | ‡ |
| <i>Montenegro, Republic of</i> | 25.3 | 28.3* | 25.5 | 14.0* | 5.5 | 1.2 | ‡ |
| <i>Netherlands</i> | 4.1* | 10.2* | 17.3* | 21.7* | 22.0 | 16.7 | 8.0 |
| <i>New Zealand</i> | 8.0* | 13.5* | 20.5* | 21.8* | 18.6 | 11.4 | 6.2 |
| <i>Norway</i> | 6.5* | 12.8* | 23.7 | 26.7* | 19.3 | 8.5 | 2.6 |
| <i>Peru</i> | 42.2* | 32.1* | 18.1* | 5.9 | 1.4 | ‡ | ‡ |
| <i>Poland</i> | 3.3* | 10.7* | 21.4* | 26.9* | 22.2 | 11.6 | 4.0 |
| <i>Portugal</i> | 8.4* | 15.9* | 23.5 | 25.1* | 17.7 | 7.9 | 1.5 |
| Puerto Rico | 29.0 | 38.1 | 25.4 | 6.6 | ‡ | ‡ | ‡ |
| <i>Qatar</i> | 44.4* | 23.3* | 16.0* | 9.4* | 4.7 | 1.9 | 0.3 |
| <i>Romania</i> | 15.0* | 27.3* | 30.6* | 18.9* | 6.7 | 1.4 | ‡ |
| <i>Russian Federation</i> | 10.5* | 20.2* | 28.4 | 24.0* | 12.6 | 3.9 | 0.5! |
| <i>Serbia, Republic of</i> | 14.3* | 23.2* | 28.6 | 20.6* | 9.8 | 2.9 | 0.6! |
| <i>Shanghai-China</i> | 1.0* | 3.4* | 9.0* | 17.0* | 23.6 | 24.3 | 21.7 |
| <i>Singapore</i> | 2.7* | 7.0* | 14.2* | 19.4* | 22.7 | 18.9 | 15.1 |
| <i>Slovak Republic</i> | 12.7* | 17.1* | 24.3 | 22.2* | 15.0 | 6.6 | 2.1 |
| <i>Slovenia</i> | 6.4* | 15.2* | 23.4 | 24.2* | 18.3 | 9.9 | 2.6 |
| <i>Spain</i> | 8.5* | 15.0* | 23.3 | 25.4* | 18.3 | 7.7 | 1.9 |
| <i>Sweden</i> | 9.1* | 15.8* | 24.9 | 24.6* | 16.5 | 7.0 | 2.1 |
| <i>Switzerland</i> | 5.0* | 9.9* | 18.9* | 24.4* | 22.4 | 13.4 | 6.0 |
| <i>Thailand</i> | 15.3* | 29.1* | 31.4* | 16.5* | 5.8 | 1.6 | 0.3! |
| <i>Tunisia</i> | 27.8 | 35.3 | 25.2 | 8.8 | 2.4 | ‡ | ‡ |
| <i>Turkey</i> | 15.8* | 25.0* | 26.3 | 17.8* | 9.6 | 4.5 | 0.9! |
| <i>United Arab Emirates</i> | 19.6* | 26.9* | 26.0 | 17.3* | 7.5 | 2.2 | 0.5 |
| <i>United Kingdom</i> | 6.9* | 13.1* | 21.4* | 24.6* | 19.9 | 10.2 | 3.8 |
| <i>United States</i> | 7.1* | 16.0* | 24.9 | 24.8* | 17.6 | 7.4 | 2.1 |
| <i>Uruguay</i> | 27.8 | 30.3* | 24.1 | 12.4* | 4.5 | 0.8 | ‡ |
| <i>Vietnam</i> | 2.5* | 8.4* | 20.4* | 29.8* | 25.9 | 10.5 | 2.5 |
| Education systems under the U.S. PISA national center | | | | | | | |
| <i>Connecticut</i> | 5.8* | 12.6* | 20.2* | 24.1* | 19.9 | 12.2 | 5.3 |
| <i>Florida</i> | 7.5* | 19.1* | 28.1 | 25.2* | 14.2 | 4.6 | 1.3! |
| <i>Massachusetts</i> | 3.9* | 10.2* | 20.1* | 25.1* | 21.1 | 13.3 | 6.3 |

See notes at end of table.

Table 4. Percentage distribution of 15-year-old students on PISA mathematics literacy content subscales, by proficiency level and education system: 2012 (continued)

| Education system | Change and relationships | | | | | | |
|--|--------------------------|-------------|-------------|------------|-------------|----------|----------|
| | Percent | | | | | | |
| | Below level 1 | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Level 6 |
| OECD average | 10.4* | 14.5* | 20.9* | 22.2* | 17.5* | 9.9 | 4.6 |
| Latin America average | 39.6* | 25.7 | 19.3* | 10.3* | 3.9* | 1.1 | 0.2 |
| <i>Albania</i> | 36.0* | 26.6 | 21.2* | 11.4* | 3.8* | 0.9 | ‡ |
| <i>Argentina</i> | 40.8* | 26.9 | 19.5 | 9.8* | 2.5 | 0.5 | ‡ |
| <i>Australia</i> | 7.3* | 12.8* | 20.3* | 22.8* | 18.9* | 11.7 | 6.2 |
| <i>Austria</i> | 8.8* | 12.6* | 19.2 | 21.3* | 19.8* | 12.3 | 5.9 |
| <i>Belgium</i> | 9.5* | 10.2* | 16.7 | 21.1* | 21.0* | 14.6 | 7.0 |
| <i>Brazil</i> | 46.3 | 24.0* | 16.5 | 8.4* | 3.3* | 1.1 | 0.3! |
| <i>Bulgaria</i> | 24.9* | 21.8* | 21.1* | 15.9* | 9.7* | 4.7 | 1.8 |
| <i>Canada</i> | 4.1* | 9.4* | 18.9 | 25.6* | 22.1* | 13.7 | 6.2 |
| <i>Chile</i> | 29.7* | 26.0 | 21.6* | 14.0* | 6.5* | 2.0 | 0.3 |
| <i>Chinese Taipei</i> | 5.2* | 8.5* | 12.8 | 17.3* | 18.8* | 18.1 | 19.4 |
| <i>Colombia</i> | 52.2 | 24.7 | 14.4 | 6.1 | 2.0 | 0.6 | ‡ |
| <i>Costa Rica</i> | 29.3* | 31.0 | 24.1* | 11.3* | 3.6* | 0.7 | ‡ |
| <i>Croatia</i> | 14.7* | 18.4* | 22.7* | 20.9* | 14.1* | 6.7 | 2.5 |
| <i>Cyprus</i> | 21.0* | 21.6* | 23.4* | 18.1* | 10.8* | 4.0 | 1.1 |
| <i>Czech Republic</i> | 9.1* | 12.6* | 20.4* | 22.9* | 18.8* | 10.7 | 5.5 |
| <i>Denmark</i> | 6.6* | 14.7* | 23.7* | 25.9* | 18.0* | 8.6 | 2.6 |
| <i>Estonia</i> | 1.9* | 7.5* | 19.6 | 28.0* | 24.7* | 13.2 | 5.1 |
| <i>Finland</i> | 4.5* | 9.7* | 19.6* | 26.2* | 21.9* | 12.1 | 6.0 |
| <i>France</i> | 10.4* | 13.1* | 19.6* | 22.8* | 18.9* | 10.4 | 4.7 |
| <i>Germany</i> | 8.6* | 10.6* | 17.2 | 21.4* | 20.3* | 14.4 | 7.6 |
| <i>Greece</i> | 18.9* | 20.9* | 23.7* | 19.8* | 11.4* | 4.2 | 1.0 |
| <i>Hong Kong-China</i> | 3.3* | 5.9* | 11.9* | 18.8* | 24.1* | 21.0 | 15.0 |
| <i>Hungary</i> | 11.1* | 16.7* | 22.9* | 22.6* | 15.4* | 8.1 | 3.2 |
| <i>Iceland</i> | 10.5* | 14.5* | 22.7* | 23.4* | 17.4* | 8.6 | 2.9 |
| <i>Indonesia</i> | 48.1 | 29.0 | 15.5 | 5.8 | 1.4! | ‡ | ‡ |
| <i>Ireland</i> | 5.3* | 12.3* | 23.2* | 28.0* | 19.8* | 9.0 | 2.4 |
| <i>Israel</i> | 19.2* | 16.8* | 19.7 | 19.2* | 14.1* | 7.5 | 3.5 |
| <i>Italy</i> | 11.8* | 16.4* | 23.3* | 23.1* | 15.9* | 7.2 | 2.3 |
| <i>Japan</i> | 4.7* | 8.1* | 15.9 | 21.7* | 21.3* | 16.4 | 11.9 |
| <i>Jordan</i> | 37.2* | 27.8 | 21.4* | 10.4* | 2.5 | ‡ | ‡ |
| <i>Kazakhstan</i> | 18.4* | 26.5 | 27.6* | 18.2* | 7.1* | 1.8 | 0.4! |
| <i>Korea, Republic of</i> | 3.2* | 6.4* | 13.8 | 20.9* | 22.3* | 18.6 | 14.8 |
| <i>Latvia</i> | 6.2* | 13.9* | 23.7* | 25.9* | 19.1* | 8.8 | 2.4 |
| <i>Liechtenstein</i> | 4.7* | 9.2* | 15.0 | 19.9* | 20.3* | 20.1 | 10.8 |
| <i>Lithuania</i> | 8.9* | 17.2* | 25.5* | 24.3* | 15.6* | 6.7 | 1.8 |
| <i>Luxembourg</i> | 11.2* | 15.3* | 21.1* | 21.8* | 18.1* | 9.4 | 3.2 |
| <i>Macao-China</i> | 3.5* | 7.6* | 15.4 | 22.9* | 23.8* | 17.3 | 9.5 |
| <i>Malaysia</i> | 33.3* | 26.3 | 21.4* | 12.0* | 5.4* | 1.4 | 0.2! |
| <i>Mexico</i> | 29.4* | 28.1 | 24.2* | 12.7* | 4.4* | 1.0 | 0.1 |
| <i>Montenegro, Republic of</i> | 34.7* | 25.4 | 20.5* | 12.9* | 4.9* | 1.3 | ‡ |
| <i>Netherlands</i> | 6.0* | 10.4* | 18.0 | 22.6* | 23.0* | 15.0 | 5.0 |
| <i>New Zealand</i> | 10.3* | 14.1* | 19.5* | 20.7* | 17.6* | 11.1 | 6.7 |
| <i>Norway</i> | 12.1* | 16.5* | 22.3* | 23.4* | 15.6* | 7.2 | 3.0 |
| <i>Peru</i> | 55.3* | 21.0* | 13.6 | 6.5 | 2.6 | 0.8! | ‡ |
| <i>Poland</i> | 6.4* | 12.8* | 21.1* | 23.8* | 19.0* | 11.2 | 5.7 |
| <i>Portugal</i> | 10.3* | 15.5* | 22.6* | 22.7* | 17.2* | 9.1 | 2.6 |
| Puerto Rico | 47.8 | 28.3 | 16.0 | 6.2 | 1.4! | ‡ | ‡ |
| <i>Qatar</i> | 52.0 | 19.6* | 13.7 | 8.2* | 4.5* | 1.7 | 0.4 |
| <i>Romania</i> | 16.1* | 25.3 | 26.0* | 18.7* | 9.5* | 3.4 | 1.1 |
| <i>Russian Federation</i> | 7.6* | 14.7* | 23.2* | 26.3* | 17.5* | 8.0 | 2.7 |
| <i>Serbia, Republic of</i> | 21.1* | 21.4* | 23.3* | 17.9* | 10.2* | 4.4 | 1.7 |
| <i>Shanghai-China</i> | 1.0* | 3.0* | 7.4* | 12.8* | 17.7* | 21.8 | 36.2 |
| <i>Singapore</i> | 2.7* | 6.3* | 11.4* | 16.5* | 20.7* | 19.5 | 22.9 |
| <i>Slovak Republic</i> | 15.2* | 15.0* | 21.3* | 21.3* | 15.5* | 8.1 | 3.6 |
| <i>Slovenia</i> | 7.4* | 14.8* | 22.3* | 22.6* | 17.7* | 10.4 | 4.8 |
| <i>Spain</i> | 9.4* | 15.8* | 24.2* | 24.8* | 17.3* | 6.9 | 1.6 |
| <i>Sweden</i> | 14.9* | 17.5* | 22.3* | 20.6* | 14.8* | 7.3 | 2.6 |
| <i>Switzerland</i> | 4.9* | 9.9* | 17.5 | 22.7* | 21.7* | 14.9 | 8.5 |
| <i>Thailand</i> | 27.7* | 27.1 | 23.5* | 13.2* | 5.7* | 2.2 | 0.7! |
| <i>Tunisia</i> | 41.6 | 26.8 | 19.1 | 8.7* | 2.8 | 0.9! | ‡ |
| <i>Turkey</i> | 16.2* | 25.0 | 25.6* | 17.3* | 10.4* | 4.3 | 1.2! |
| <i>United Arab Emirates</i> | 18.6* | 24.0* | 24.9* | 18.3* | 9.3* | 3.9 | 1.1 |
| <i>United Kingdom</i> | 8.4* | 13.9* | 22.2* | 23.9* | 17.7* | 9.9 | 3.9 |
| <i>United States</i> | 7.9* | 17.0* | 24.0* | 23.9* | 15.7* | 8.2 | 3.3 |
| <i>Uruguay</i> | 33.9* | 23.5* | 20.4* | 13.2* | 6.5* | 1.9 | 0.5! |
| <i>Vietnam</i> | 5.3* | 11.7* | 21.7* | 26.2* | 20.1* | 10.7 | 4.4 |
| Education systems under the U.S. PISA national center | | | | | | | |
| <i>Connecticut</i> | 7.0* | 12.5* | 19.7 | 22.3* | 18.2* | 12.8 | 7.6 |
| <i>Florida</i> | 9.1* | 18.8* | 26.3* | 23.4* | 14.2* | 6.3 | 2.0! |
| <i>Massachusetts</i> | 6.2* | 11.9* | 19.4 | 22.0* | 20.1* | 12.5 | 8.0 |

See notes at end of table.

Table 4. Percentage distribution of 15-year-old students on PISA mathematics literacy content subscales, by proficiency level and education system: 2012 (continued)

| Education system | Space and shape | | | | | | |
|--|-----------------|-------------|-------------|------------|----------|----------|----------|
| | Below level 1 | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Level 6 |
| OECD average | 10.0* | 15.8* | 22.3 | 22.2* | 16.3 | 8.9 | 4.5 |
| Latin America average | 34.5 | 29.5* | 21.3 | 10.1* | 3.6 | 0.9 | 0.1 |
| <i>Albania</i> | 27.0* | 23.9* | 22.8* | 15.3* | 7.3 | 2.6 | 1.0 |
| <i>Argentina</i> | 36.5 | 31.6* | 21.4 | 8.4* | 1.9 | 0.3! | ‡ |
| <i>Australia</i> | 8.1* | 15.3* | 21.9 | 23.5* | 16.9 | 9.3 | 5.0 |
| <i>Austria</i> | 7.3* | 13.7* | 21.8 | 23.7* | 19.0 | 10.2 | 4.3 |
| <i>Belgium</i> | 8.4* | 12.7* | 19.4 | 21.7* | 18.4 | 12.4 | 6.9 |
| <i>Brazil</i> | 40.3 | 30.6* | 18.8 | 7.3* | 2.4 | 0.6! | 0.1! |
| <i>Bulgaria</i> | 19.1* | 23.2* | 24.9* | 18.0* | 10.1 | 3.8 | 0.9 |
| <i>Canada</i> | 5.3* | 12.0* | 22.0 | 24.7* | 19.9 | 11.0 | 5.1 |
| <i>Chile</i> | 25.0* | 28.4* | 24.1* | 14.3* | 6.2 | 1.7 | 0.3 |
| <i>Chinese Taipei</i> | 4.6* | 7.2* | 10.9* | 13.3* | 16.0 | 16.9 | 31.1 |
| <i>Colombia</i> | 45.7* | 29.3* | 16.5 | 6.3* | 1.8 | 0.2! | ‡ |
| <i>Costa Rica</i> | 29.9* | 34.9* | 23.4* | 8.5* | 2.5 | 0.6! | ‡ |
| <i>Croatia</i> | 11.2* | 23.2* | 28.2* | 20.8* | 10.9 | 4.1 | 1.7! |
| <i>Cyprus</i> | 19.8* | 24.4* | 25.8* | 17.9* | 8.7 | 2.9 | 0.6 |
| <i>Czech Republic</i> | 8.3* | 14.2* | 21.4 | 23.2* | 18.1 | 10.2 | 4.7 |
| <i>Denmark</i> | 5.1* | 13.1* | 24.3* | 29.0* | 18.9 | 7.6 | 1.9 |
| <i>Estonia</i> | 4.3* | 11.6* | 22.0 | 25.9* | 20.1 | 10.8 | 5.2 |
| <i>Finland</i> | 4.7* | 12.0* | 23.1* | 27.1* | 19.5 | 10.0 | 3.8 |
| <i>France</i> | 9.5* | 15.9* | 22.1 | 23.1* | 17.0 | 8.8 | 3.4 |
| <i>Germany</i> | 6.5* | 12.6* | 20.8 | 24.2* | 20.1 | 11.2 | 4.7 |
| <i>Greece</i> | 18.9* | 24.2* | 26.6* | 18.7* | 8.7 | 2.5 | 0.4 |
| <i>Hong Kong-China</i> | 3.2* | 6.4* | 12.2* | 18.1* | 22.6 | 20.3 | 17.1 |
| <i>Hungary</i> | 10.8* | 19.2* | 25.7* | 21.9* | 13.0 | 6.5 | 2.9 |
| <i>Iceland</i> | 7.4* | 14.4* | 24.8* | 26.9* | 17.3 | 7.7 | 1.6 |
| <i>Indonesia</i> | 38.8 | 30.4* | 19.8 | 7.8* | 2.8 | 0.4! | ‡ |
| <i>Ireland</i> | 10.2* | 16.5* | 24.7* | 24.5* | 15.7 | 6.5 | 1.8 |
| <i>Israel</i> | 19.4* | 20.1* | 22.4 | 19.5* | 11.8 | 5.1 | 1.6 |
| <i>Italy</i> | 10.7* | 15.9* | 22.4 | 21.7* | 15.7 | 9.0 | 4.6 |
| <i>Japan</i> | 2.3* | 6.1* | 14.4* | 22.4* | 23.1 | 17.9 | 13.8 |
| <i>Jordan</i> | 37.4 | 30.8* | 20.6 | 8.5* | 2.1 | ‡ | ‡ |
| <i>Kazakhstan</i> | 13.6* | 24.2* | 28.6* | 19.8* | 10.0 | 3.1 | 0.7! |
| <i>Korea, Republic of</i> | 2.8* | 5.9* | 12.7* | 18.6* | 20.9 | 18.5 | 20.6 |
| <i>Latvia</i> | 5.2* | 13.7* | 25.4* | 26.7* | 18.2 | 8.0 | 2.8 |
| <i>Liechtenstein</i> | 3.9!* | 7.6* | 16.2 | 23.9* | 21.7 | 16.9 | 9.8 |
| <i>Lithuania</i> | 12.2* | 18.3* | 24.1* | 22.0* | 14.6 | 6.5 | 2.2 |
| <i>Luxembourg</i> | 8.7* | 16.9* | 23.5* | 22.9* | 17.0 | 8.2 | 2.7 |
| <i>Macao-China</i> | 3.7* | 7.0* | 13.8* | 19.9* | 21.8 | 18.2 | 15.6 |
| <i>Malaysia</i> | 19.1* | 26.4* | 26.1* | 17.5* | 8.2 | 2.4 | 0.3! |
| <i>Mexico</i> | 25.0* | 29.4* | 26.2* | 13.7* | 4.6 | 1.0 | 0.1 |
| <i>Montenegro, Republic of</i> | 25.2* | 30.8* | 25.2* | 13.0* | 4.8 | 0.9 | ‡ |
| <i>Netherlands</i> | 5.8* | 12.5* | 20.9 | 25.1* | 21.1 | 10.6 | 4.1 |
| <i>New Zealand</i> | 8.5* | 16.3* | 23.4* | 22.8* | 15.8 | 8.6 | 4.4 |
| <i>Norway</i> | 11.1* | 16.5* | 23.4* | 23.0* | 15.4 | 7.5 | 3.2 |
| <i>Peru</i> | 45.4* | 26.5* | 17.0 | 7.5* | 2.7 | 0.8! | ‡ |
| <i>Poland</i> | 3.7* | 11.7* | 21.1 | 23.2* | 19.0 | 12.9 | 8.5 |
| <i>Portugal</i> | 11.1* | 15.9* | 20.7 | 20.2* | 17.2 | 10.0 | 5.0 |
| Puerto Rico | 37.0 | 39.4 | 19.2 | 3.9 | ‡ | ‡ | ‡ |
| <i>Qatar</i> | 44.7* | 23.4* | 16.0 | 9.2* | 4.5 | 1.8 | 0.3 |
| <i>Romania</i> | 16.2* | 24.0* | 26.9* | 18.5* | 9.4 | 3.8 | 1.2! |
| <i>Russian Federation</i> | 6.9* | 14.8* | 23.9* | 24.2* | 17.3 | 9.0 | 3.8 |
| <i>Serbia, Republic of</i> | 18.6* | 22.7* | 24.4* | 18.3* | 10.1 | 4.2 | 1.7 |
| <i>Shanghai-China</i> | 0.7* | 2.4* | 5.5* | 9.8* | 14.9 | 20.8 | 45.9 |
| <i>Singapore</i> | 3.2* | 6.4* | 11.2* | 16.7* | 19.7 | 19.4 | 23.4 |
| <i>Slovak Republic</i> | 11.2* | 15.1* | 21.6 | 21.4* | 16.0 | 9.6 | 5.1 |
| <i>Slovenia</i> | 6.5* | 14.0* | 22.8 | 22.8* | 17.9 | 10.7 | 5.2 |
| <i>Spain</i> | 10.1* | 17.7* | 24.7* | 23.4* | 15.6 | 6.6 | 2.0 |
| <i>Sweden</i> | 12.0* | 18.4* | 25.4* | 22.8* | 14.3 | 5.4 | 1.6 |
| <i>Switzerland</i> | 3.5* | 7.9* | 16.0 | 22.3* | 23.1 | 16.1 | 11.1 |
| <i>Thailand</i> | 21.7* | 25.8* | 25.1* | 15.5* | 7.4 | 3.3 | 1.4 |
| <i>Tunisia</i> | 40.8 | 28.4* | 18.9 | 8.2* | 2.6 | 0.8! | ‡ |
| <i>Turkey</i> | 22.5* | 23.0* | 21.6 | 14.9* | 9.4 | 5.7 | 2.9 |
| <i>United Arab Emirates</i> | 25.5* | 24.7* | 22.5 | 15.9* | 7.9 | 2.8 | 0.7 |
| <i>United Kingdom</i> | 12.0* | 17.5* | 23.8* | 22.5* | 14.5 | 7.0 | 2.7 |
| <i>United States</i> | 13.5* | 20.9* | 25.0* | 20.6* | 12.4 | 5.4 | 2.2 |
| <i>Uruguay</i> | 28.5* | 25.5* | 22.6 | 14.8* | 6.7 | 1.6 | ‡ |
| <i>Vietnam</i> | 6.4* | 12.8* | 21.8 | 24.2* | 18.6 | 10.7 | 5.5 |
| Education systems under the U.S. PISA national center | | | | | | | |
| <i>Connecticut</i> | 11.6* | 16.7* | 20.4 | 21.1* | 15.8 | 9.6 | 4.7 |
| <i>Florida</i> | 16.4* | 22.5* | 26.5* | 20.5* | 9.6 | 3.9 | ‡ |
| <i>Massachusetts</i> | 9.2* | 15.3* | 21.2 | 21.4* | 16.4 | 10.5 | 5.96 |

! Interpret data with caution. Estimate is unstable due to high coefficient of variation.

‡ Reporting standards not met.

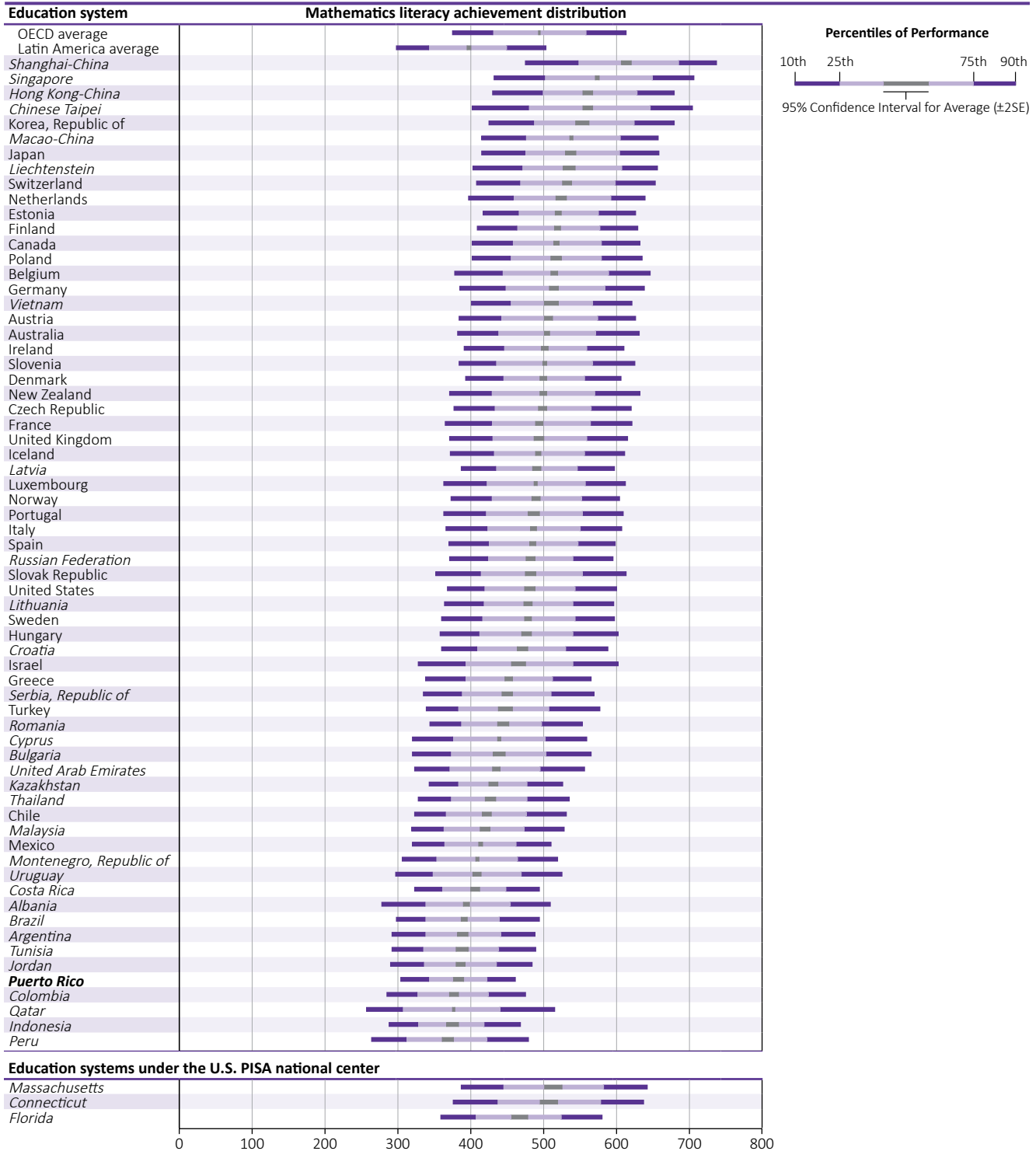
* p<.05. Significantly different from the Puerto Rico percentage at the .05 level of statistical significance.

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into mathematics literacy levels according to their content subscale scores. Exact cut scores are as follows: below level 1 (a score less than or equal to 357.77); level 1 (a score greater than 357.77 and less than or equal to 420.07); level 2 (a score greater than 420.07 and less than or equal to 482.38); level 3 (a score greater than 482.38 and less than or equal to 544.68); level 4 (a score greater than 544.68 and less than or equal to 606.99); level 5 (a score greater than 606.99 and less than or equal to 669.30); and level 6 (a score greater than 669.30). Scores are reported on a scale from 0 to 1,000. The OECD average is the average of the national percentages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national percentages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Detail may not sum to totals because of rounding. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only. SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Performance at Select Percentiles

- ▶ Figure 1 shows the distribution of achievement on the mathematics literacy scale at select percentiles. Each country's percentile distribution is shown, allowing comparison of cut scores for high, low, and average performers in each education systems. Performance along percentiles also allows comparison of the distribution of achievement across education systems.
- ▶ The Puerto Rico average scores at the 75th and 90th percentiles were lower than the Latin America average scores at the corresponding percentiles but not measurably different from the Latin America average scores at the 10th and 25th percentiles.
- ▶ Sixty-two education systems (including the U.S.) and the 3 education systems under the U.S. PISA national center of Massachusetts, Connecticut, and Florida had higher scores than Puerto Rico at the 90th percentile and 3 education systems had scores not measurably different than Puerto Rico at the 90th percentile.
- ▶ Fifty-four education systems (including the U.S.) and the 3 education systems under the U.S. PISA national center of Massachusetts, Connecticut, and Florida had higher scores than Puerto Rico at the 10th percentile. Seven education systems had lower scores than Puerto Rico at the 10th percentile, and 4 education systems had scores not measurably different than Puerto Rico at the 10th percentile.
- ▶ The Puerto Rico 90th-10th percentile gap was 157 scale score points. This was smaller than the OECD average and Latin America average 90th-10th percentile gaps. Mathematics literacy scores in Puerto Rico showed little variation and no education systems had a 90th-10th percentile gap smaller than Puerto Rico. Only one education system (Costa Rica) had a 90th-10th percentile gap not measurably different than Puerto Rico.

Figure 1. Distribution of achievement of 15-year-old students on PISA mathematics literacy scale, by education system: 2012



NOTE: This figure shows the threshold (or cut) scores for the following: (a) 10th percentile- the bottom 10 percent of students; (b) 25th percentile- the bottom 25 percent of students; (d) 75th percentile- the top 25 percent of students; (e) 90th percentile- the top 10 percent of students. The percentile ranges are specific to each education system's distribution of scores, enabling users to compare cut scores across education systems. This figure also shows the 95% confidence interval for the average. The lower threshold (or cut) score for the 95% confidence interval for the average is the average score minus 2 standard errors. The upper threshold (or cut) score for the 95% confidence interval for the average is the average score plus 2 standard errors. Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Detail may not sum to totals because of rounding. Scores are reported on a scale from 0 to 1,000. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

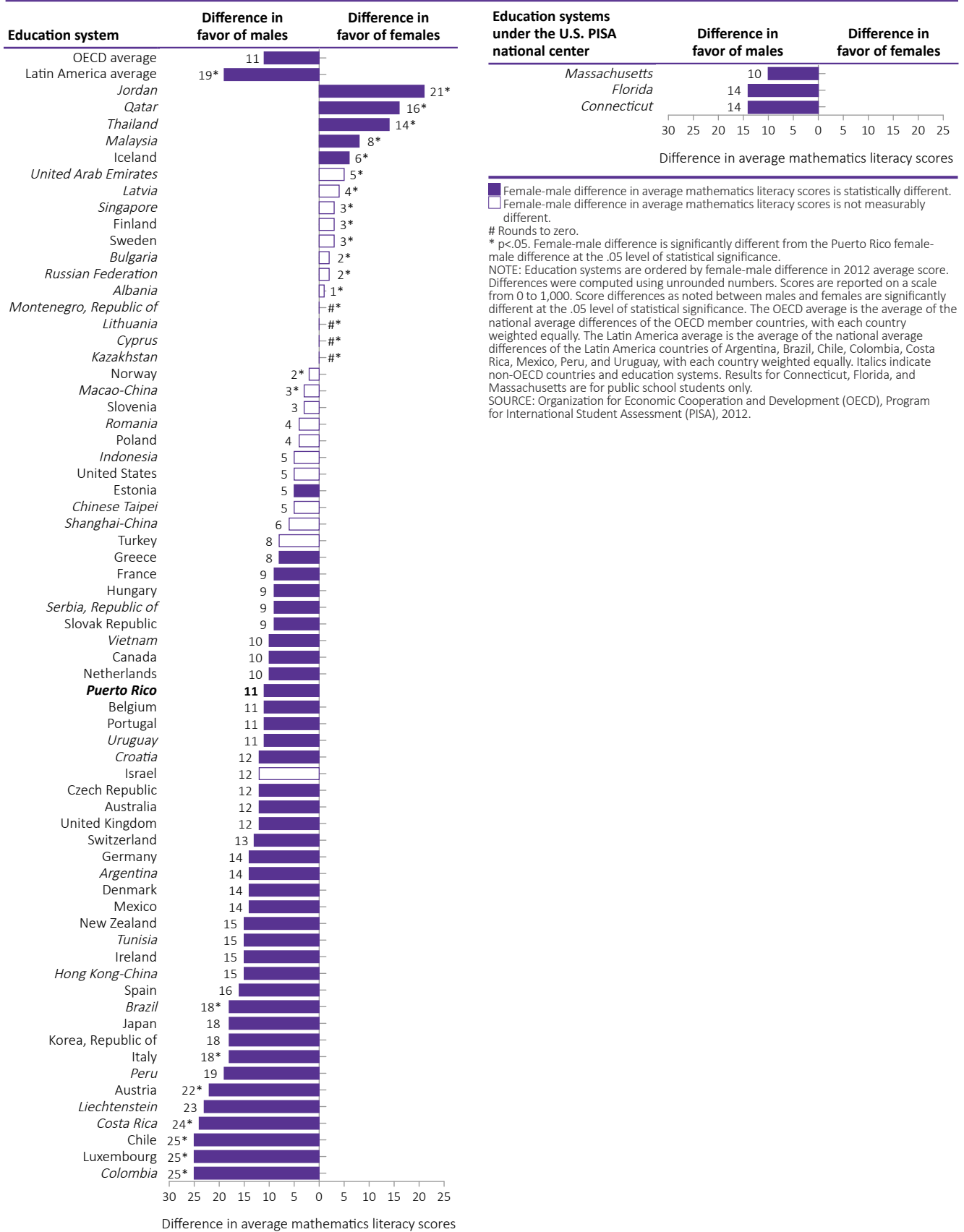
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Average Scores of Female and Male Students

- ▶ On average, male students scored higher than female students by 11 scale score points in mathematics literacy in Puerto Rico.
- ▶ The Latin America average had a gender gap larger than that of Puerto Rico, while the U.S. and OECD average had gender gaps not measurably different than Puerto Rico.
- ▶ Most education systems (43 of 66 education systems), the OECD countries on average, and the Latin America countries on average had a significant gender gap on the mathematics literacy scale. In 38 education systems (including Puerto Rico), the OECD countries on average, the Latin America countries on average, and in the 3 education systems under the U.S. PISA national center, male students had a higher average score. In 5 education systems, the gender gap favored female students. However, there was no measurable gender gap in 23 education systems (including the U.S.).
- ▶ The gender gap ranged from 5 scale score points in Estonia, where male students had a higher average score, to 25 scale score points in Chile, Luxembourg, and Colombia, where male students had higher average scores.
- ▶ Twenty-six education systems had a gender gap significantly different than that of Puerto Rico. However, 39 education systems and the 3 education systems under the U.S. PISA national center of Connecticut, Florida, and Massachusetts, had gender gaps not measurably different from Puerto Rico.

Figure 2. Difference in average scores of 15-year-old female and male students on PISA mathematics literacy scale, by education system: 2012



Performance at Quarters of the Economic, Social, and Cultural Status Index

- ▶ The PISA index of students' economic, social, and cultural status (ESCS) captures a range of aspects of a student's family and home background that combines information on parents' education and occupations and home possessions. Details on the ESCS index can be found in appendix A.
- ▶ The Puerto Rico mathematics literacy score was 357 at the bottom quarter of the national ESCS index, 372 at the second quarter, 387 at the third quarter, and 416 at the top quarter.
- ▶ The Puerto Rico average mathematics literacy score was lower than the OECD average and U.S. average mathematics scores at each national quarter of the ESCS index.
- ▶ The Puerto Rico average mathematics literacy score was not measurably different than the Latin America average mathematics literacy score at the bottom quarter of the national ESCS index but was lower than the Latin America average mathematics literacy scores at the second, third, and top quarters of the index.

Table 5. Average scores of 15-year-old students on PISA mathematics literacy scale, by national quarters of the PISA index of economic, social, and cultural status (ESCS) and education system: 2012

| Education system | Average Score | | | | All students |
|--|-------------------------------------|----------------|---------------|-------------|--------------|
| | National quarters of the ESCS index | | | | |
| | Bottom quarter | Second quarter | Third quarter | Top quarter | |
| OECD average | 452* | 482* | 506* | 542* | 494 |
| Latin America average | 358 | 384* | 404* | 446* | 397 |
| <i>Albania</i> | — | — | — | — | 394 |
| <i>Argentina</i> | 355 | 379 | 394 | 433 | 388 |
| Australia | 463* | 492* | 521* | 550* | 504 |
| Austria | 458* | 495* | 519* | 552* | 506 |
| Belgium | 468* | 497* | 534* | 567* | 515 |
| <i>Brazil</i> | 360 | 377 | 395 | 437* | 391 |
| <i>Bulgaria</i> | 384* | 424* | 449* | 501* | 439 |
| Canada | 486* | 509* | 529* | 558* | 518 |
| Chile | 378* | 409* | 429* | 477* | 423 |
| <i>Chinese Taipei</i> | 497* | 546* | 572* | 626* | 560 |
| <i>Colombia</i> | 343* | 365 | 382 | 417 | 376 |
| <i>Costa Rica</i> | 373* | 394* | 412* | 450* | 407 |
| <i>Croatia</i> | 438* | 459* | 471* | 517* | 471 |
| <i>Cyprus</i> | 398* | 428* | 448* | 492* | 440 |
| Czech Republic | 450* | 486* | 508* | 552* | 499 |
| Denmark | 460* | 489* | 513* | 545* | 500 |
| Estonia | 496* | 508* | 523* | 559* | 521 |
| Finland | 488* | 509* | 529* | 555* | 519 |
| France | 442* | 476* | 511* | 561* | 495 |
| Germany | 467* | 502* | 540* | 569* | 514 |
| Greece | 413* | 439* | 460* | 502* | 453 |
| <i>Hong Kong-China</i> | 532* | 554* | 567* | 600* | 561 |
| Hungary | 422* | 464* | 486* | 539* | 477 |
| Iceland | 464* | 481* | 508* | 526* | 493 |
| <i>Indonesia</i> | 356 | 363 | 374* | 408 | 375 |
| Ireland | 462* | 489* | 512* | 545* | 501 |
| Israel | 409* | 452* | 490* | 524* | 466 |
| Italy | 447* | 475* | 498* | 522* | 485 |
| Japan | 500* | 528* | 551* | 575* | 536 |
| <i>Jordan</i> | 361 | 375 | 395 | 419 | 386 |
| <i>Kazakhstan</i> | 405* | 427* | 437* | 458* | 432 |
| Korea, Republic of | 516* | 538* | 567* | 595* | 554 |
| <i>Latvia</i> | 453* | 472* | 508* | 532* | 491 |
| <i>Liechtenstein</i> | 490* | 552* | 542* | 564* | 535 |
| <i>Lithuania</i> | 439* | 465* | 491* | 522* | 479 |
| Luxembourg | 438* | 470* | 508* | 546* | 490 |
| <i>Macao-China</i> | 521* | 535* | 543* | 558* | 538 |
| <i>Malaysia</i> | 388* | 406* | 425* | 465* | 421 |
| Mexico | 385* | 407* | 417* | 447* | 413 |
| <i>Montenegro, Republic of</i> | 375* | 401* | 413* | 453* | 410 |
| Netherlands | 484* | 513* | 537* | 565* | 523 |
| New Zealand | 444* | 493* | 514* | 559* | 500 |
| Norway | 459* | 479* | 504* | 522* | 489 |
| <i>Peru</i> | 317* | 352* | 382 | 421 | 368 |
| Poland | 473* | 501* | 526* | 571* | 518 |
| Portugal | 441* | 474* | 495* | 548* | 487 |
| Puerto Rico | 357 | 372 | 387 | 416 | 382 |
| <i>Qatar</i> | 338* | 377 | 399* | 401 | 376 |
| <i>Romania</i> | 407* | 428* | 444* | 501* | 445 |
| <i>Russian Federation</i> | 445* | 468* | 496* | 521* | 482 |
| <i>Serbia, Republic of</i> | 416* | 436* | 450* | 495* | 449 |
| <i>Shanghai-China</i> | 562* | 602* | 627* | 660* | 613 |
| <i>Singapore</i> | 523* | 557* | 588* | 627* | 573 |
| Slovak Republic | 416* | 473* | 496* | 545* | 482 |
| Slovenia | 458* | 486* | 511* | 552* | 501 |
| Spain | 442* | 471* | 495* | 533* | 484 |
| Sweden | 443* | 470* | 495* | 518* | 478 |
| Switzerland | 488* | 519* | 543* | 576* | 531 |
| <i>Thailand</i> | 407* | 412* | 421* | 468* | 427 |
| <i>Tunisia</i> | 362 | 370 | 393 | 430 | 388 |
| Turkey | 412* | 436* | 447* | 498* | 448 |
| <i>United Arab Emirates</i> | 391* | 427* | 454* | 466* | 434 |
| United Kingdom | 458* | 477* | 508* | 545* | 494 |
| United States | 442* | 462* | 494* | 532* | 481 |
| <i>Uruguay</i> | 364 | 390* | 414* | 472* | 409 |
| <i>Vietnam</i> | 473* | 499* | 518* | 555* | 511 |
| Education systems under the U.S. PISA national center | | | | | |
| <i>Connecticut</i> | 450* | 482* | 529* | 570* | 506 |
| <i>Florida</i> | 430* | 455* | 465* | 521* | 467 |
| <i>Massachusetts</i> | 459* | 491* | 533* | 576* | 514 |

— Not available.

*p<.05. Significantly different from the Puerto Rico average score at the .05 level of statistical significance.

NOTE: The PISA index of economic, social and cultural status (ESCS) was created using student reports on parental occupation, the highest level of parental education, and an index of home possessions related to family wealth, home educational resources and possessions related to “classical” culture in the family home. The home possessions relating to “classical” culture in the family home included possessions such as works of classical literature, books of poetry, and works of art (e.g. paintings). The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA),

Science Performance in Puerto Rico and Internationally

Average Score

- ▶ Average scores ranged from 580 in Shanghai-China to 373 in Peru.
- ▶ The Puerto Rico average score was 401. This was lower than the OECD average, 55 education systems (including the U.S.), and the 3 education

systems under the U.S. PISA national center of Massachusetts, Connecticut, and Florida. The Puerto Rico average was higher than 3 education systems and not measurably different than the Latin America average and 7 education systems, including Argentina, Brazil, Colombia, the Republic of Montenegro, Jordan, Tunisia, and Albania.

Table 6. Average scores of 15-year-old students on PISA science literacy scale, by education system: 2012

| Education system | Average score | Education system | Average score |
|------------------------|---------------|--|---------------|
| OECD average | 501 ▲ | | |
| Latin America average | 411 | | |
| <i>Shanghai-China</i> | 580 ▲ | <i>Russian Federation</i> | 486 ▲ |
| <i>Hong Kong-China</i> | 555 ▲ | Sweden | 485 ▲ |
| <i>Singapore</i> | 551 ▲ | Iceland | 478 ▲ |
| Japan | 547 ▲ | Slovak Republic | 471 ▲ |
| Finland | 545 ▲ | Israel | 470 ▲ |
| Estonia | 541 ▲ | Greece | 467 ▲ |
| Korea, Republic of | 538 ▲ | Turkey | 463 ▲ |
| <i>Vietnam</i> | 528 ▲ | <i>United Arab Emirates</i> | 448 ▲ |
| Poland | 526 ▲ | <i>Bulgaria</i> | 446 ▲ |
| Canada | 525 ▲ | Chile | 445 ▲ |
| <i>Liechtenstein</i> | 525 ▲ | <i>Serbia, Republic of</i> | 445 ▲ |
| Germany | 524 ▲ | <i>Thailand</i> | 444 ▲ |
| <i>Chinese Taipei</i> | 523 ▲ | <i>Romania</i> | 439 ▲ |
| Netherlands | 522 ▲ | <i>Cyprus</i> | 438 ▲ |
| Ireland | 522 ▲ | <i>Costa Rica</i> | 429 ▲ |
| Australia | 521 ▲ | <i>Kazakhstan</i> | 425 ▲ |
| <i>Macao-China</i> | 521 ▲ | <i>Malaysia</i> | 420 ▲ |
| New Zealand | 516 ▲ | <i>Uruguay</i> | 416 ▲ |
| Switzerland | 515 ▲ | Mexico | 415 ▲ |
| Slovenia | 514 ▲ | <i>Montenegro, Republic of</i> | 410 |
| United Kingdom | 514 ▲ | <i>Jordan</i> | 409 |
| Czech Republic | 508 ▲ | <i>Argentina</i> | 406 |
| Austria | 506 ▲ | <i>Brazil</i> | 405 |
| Belgium | 505 ▲ | Puerto Rico | 401 |
| <i>Latvia</i> | 502 ▲ | <i>Colombia</i> | 399 |
| France | 499 ▲ | <i>Tunisia</i> | 398 |
| Denmark | 498 ▲ | <i>Albania</i> | 397 |
| United States | 497 ▲ | <i>Qatar</i> | 384 ▼ |
| Spain | 496 ▲ | <i>Indonesia</i> | 382 ▼ |
| <i>Lithuania</i> | 496 ▲ | <i>Peru</i> | 373 ▼ |
| Norway | 495 ▲ | | |
| Hungary | 494 ▲ | Education systems under the U.S. PISA national center | |
| Italy | 494 ▲ | <i>Massachusetts</i> | 527 ▲ |
| <i>Croatia</i> | 491 ▲ | <i>Connecticut</i> | 521 ▲ |
| Luxembourg | 491 ▲ | <i>Florida</i> | 485 ▲ |
| Portugal | 489 ▲ | | |

▲ Average score is higher than Puerto Rico average score.

▼ Average score is lower than Puerto Rico average score.

NOTE: Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Scores are reported on a scale from 0 to 1,000. All average scores reported as higher or lower than the Puerto Rico average score are different at the .05 level of statistical significance. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Performance at Science Literacy Proficiency Levels

- ▶ Nearly all students in Puerto Rico scored at proficiency levels 4 or below.
- ▶ The percentages of Puerto Rico students scoring at proficiency levels 3 and 4 were lower than the OECD average and U.S. percentages but not measurably different than the Latin America average percentages.
- ▶ The percentage of Puerto Rico students scoring at proficiency level 2 was higher than the OECD average percentage but not measurably different than the Latin America average or U.S. percentages.
- ▶ The percentages of Puerto Rico students scoring at proficiency levels 1 and below level 1 were higher than the OECD average and U.S. percentages but not measurably different than the Latin America average percentages.

Table 7. Percentage distribution of 15-year-old students on PISA science literacy scale, by proficiency level and education system: 2012

| Education system | Percent | | | | | | Level 6 |
|--|---------------|-------------|-------------|-------------|-------------|----------|----------|
| | Below level 1 | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | |
| OECD average | 4.8* | 13.0* | 24.5* | 28.8* | 20.5* | 7.2 | 1.1 |
| Latin America average | 17.3 | 32.3 | 32.0 | 14.6 | 3.4 | 0.4 | ‡ |
| <i>Albania</i> | 23.5 | 29.6* | 28.5 | 14.4 | 3.6 | 0.4! | ‡ |
| <i>Argentina</i> | 19.8 | 31.0* | 31.1 | 14.8 | 3.0 | 0.2! | ‡ |
| <i>Australia</i> | 3.4* | 10.2* | 21.5* | 28.5* | 22.8* | 10.9 | 2.6 |
| <i>Austria</i> | 3.6* | 12.2* | 24.3* | 30.1* | 21.9* | 7.0 | 0.8 |
| <i>Belgium</i> | 5.9* | 11.8* | 21.5* | 28.7* | 23.0* | 8.1 | 0.9 |
| <i>Brazil</i> | 18.6 | 35.1 | 30.7 | 12.5 | 2.8 | 0.3! | ‡ |
| <i>Bulgaria</i> | 14.4 | 22.5* | 26.3 | 22.5* | 11.2* | 2.8 | 0.3! |
| <i>Canada</i> | 2.4* | 8.0* | 21.0* | 32.0* | 25.3* | 9.5 | 1.8 |
| <i>Chile</i> | 8.1* | 26.3* | 34.6* | 22.4* | 7.5* | 1.0 | #! |
| <i>Chinese Taipei</i> | 1.6* | 8.2* | 20.8* | 33.7* | 27.3* | 7.8 | 0.6 |
| <i>Colombia</i> | 19.8 | 36.3 | 30.8 | 11.0 | 1.9 | ‡ | ‡ |
| <i>Costa Rica</i> | 8.6* | 30.7* | 39.2* | 17.8* | 3.4 | 0.2! | ‡ |
| <i>Croatia</i> | 3.2* | 14.0* | 29.1 | 31.4* | 17.6* | 4.3 | ‡ |
| <i>Cyprus</i> | 14.4* | 23.7* | 30.3 | 21.3* | 8.4* | 1.8 | 0.2! |
| <i>Czech Republic</i> | 3.3* | 10.5* | 24.7* | 31.7* | 22.2* | 6.7 | 0.9 |
| <i>Denmark</i> | 4.7* | 12.0* | 25.7 | 31.3* | 19.6* | 6.1 | 0.7 |
| <i>Estonia</i> | 0.5* | 4.5* | 19.0* | 34.5* | 28.7* | 11.1 | 1.7 |
| <i>Finland</i> | 1.8* | 5.9* | 16.8* | 29.6* | 28.8* | 13.9 | 3.2 |
| <i>France</i> | 6.1* | 12.6* | 22.9* | 29.2* | 21.3* | 6.9 | 1.0 |
| <i>Germany</i> | 2.9* | 9.3* | 20.5* | 28.9* | 26.2* | 10.6 | 1.6 |
| <i>Greece</i> | 7.4* | 18.1* | 31.0 | 28.8* | 12.2* | 2.3 | ‡ |
| <i>Hong Kong-China</i> | 1.2* | 4.4* | 13.0* | 29.8* | 34.9* | 14.9 | 1.8 |
| <i>Hungary</i> | 4.1* | 14.0* | 26.4 | 30.9* | 18.7* | 5.5 | 0.5! |
| <i>Iceland</i> | 8.0* | 16.0* | 27.5 | 27.2* | 16.2* | 4.6 | 0.6 |
| <i>Indonesia</i> | 24.7 | 41.9* | 26.3 | 6.5* | ‡ | ‡ | ‡ |
| <i>Ireland</i> | 2.6* | 8.5* | 22.0* | 31.1* | 25.0* | 9.3 | 1.5 |
| <i>Israel</i> | 11.2* | 17.7* | 24.8* | 24.4* | 16.1* | 5.2 | 0.6! |
| <i>Italy</i> | 4.9* | 13.8* | 26.0 | 30.1* | 19.1* | 5.5 | 0.6 |
| <i>Japan</i> | 2.0* | 6.4* | 16.3* | 27.5* | 29.5* | 14.8 | 3.4 |
| <i>Jordan</i> | 18.2 | 31.4* | 32.2 | 15.0 | 3.0 | ‡ | ‡ |
| <i>Kazakhstan</i> | 11.3* | 30.7* | 36.8* | 17.8* | 3.3 | 0.2! | ‡ |
| <i>Korea, Republic of</i> | 1.2* | 5.5* | 18.0* | 33.6* | 30.1* | 10.6 | 1.1! |
| <i>Latvia</i> | 1.8* | 10.5* | 28.2 | 35.1* | 20.0* | 4.0 | 0.3! |
| <i>Liechtenstein</i> | ‡ | 9.6* | 22.0 | 30.8* | 26.7* | 9.1 | ‡ |
| <i>Lithuania</i> | 3.4* | 12.7* | 27.6 | 32.9* | 18.3* | 4.7 | 0.4 |
| <i>Luxembourg</i> | 7.2* | 15.1* | 24.2* | 26.2* | 19.2* | 7.0 | 1.2 |
| <i>Macao-China</i> | 1.4* | 7.4* | 22.2* | 36.2* | 26.2* | 6.2 | 0.4 |
| <i>Malaysia</i> | 14.5 | 31.0* | 33.9 | 16.5* | 3.7 | 0.3! | ‡ |
| <i>Mexico</i> | 12.6 | 34.4 | 37.0* | 13.8 | 2.1 | 0.1! | ‡ |
| <i>Montenegro, Republic of</i> | 18.7 | 32.0 | 29.7 | 15.4 | 3.8* | 0.4! | ‡ |
| <i>Netherlands</i> | 3.1* | 10.1* | 20.1* | 29.1* | 25.8* | 10.5 | 1.3 |
| <i>New Zealand</i> | 4.7* | 11.6* | 21.7* | 26.4* | 22.3* | 10.7 | 2.7 |
| <i>Norway</i> | 6.0* | 13.6* | 24.8* | 28.9* | 19.0* | 6.4 | 1.1 |
| <i>Peru</i> | 31.5* | 37.0 | 23.5* | 7.0* | 1.0 | ‡ | ‡ |
| <i>Poland</i> | 1.3* | 7.7* | 22.5* | 33.1* | 24.5* | 9.1 | 1.7 |
| <i>Portugal</i> | 4.7* | 14.3* | 27.3 | 31.4* | 17.8* | 4.2 | 0.3! |
| Puerto Rico | 19.4 | 36.1 | 29.8 | 12.4 | 2.1! | ‡ | ‡ |
| <i>Qatar</i> | 34.6* | 28.0* | 19.6* | 11.2 | 5.1* | 1.3 | 0.1 |
| <i>Romania</i> | 8.7* | 28.7* | 34.6* | 21.0* | 6.2* | 0.9 | ‡ |
| <i>Russian Federation</i> | 3.6* | 15.1* | 30.1 | 31.2* | 15.7* | 3.9 | 0.3! |
| <i>Serbia, Republic of</i> | 10.3* | 24.7* | 32.4 | 22.8* | 8.1* | 1.6 | ‡ |
| <i>Shanghai-China</i> | 0.3!* | 2.4* | 10.0* | 24.6* | 35.5* | 23.0 | 4.2 |
| <i>Singapore</i> | 2.2* | 7.4* | 16.7* | 24.0* | 27.0* | 16.9 | 5.8 |
| <i>Slovak Republic</i> | 9.2* | 17.6* | 27.0 | 26.2* | 15.0* | 4.3 | 0.6! |
| <i>Slovenia</i> | 2.4* | 10.4* | 24.5* | 30.0* | 23.0* | 8.4 | 1.2 |
| <i>Spain</i> | 3.7* | 12.0* | 27.3 | 32.8* | 19.4* | 4.5 | 0.3 |
| <i>Sweden</i> | 7.3* | 15.0* | 26.2 | 28.0* | 17.2* | 5.6 | 0.7 |
| <i>Switzerland</i> | 3.0* | 9.8* | 22.8* | 31.3* | 23.7* | 8.3 | 1.0 |
| <i>Thailand</i> | 7.0* | 26.6* | 37.5* | 21.6* | 6.4* | 0.9! | ‡ |
| <i>Tunisia</i> | 21.3 | 34.0 | 31.1 | 11.7 | 1.8 | ‡ | ‡ |
| <i>Turkey</i> | 4.4* | 21.9* | 35.4* | 25.1* | 11.3* | 1.8 | ‡ |
| <i>United Arab Emirates</i> | 11.3* | 23.8* | 29.9 | 22.3* | 10.1* | 2.3 | 0.3 |
| <i>United Kingdom</i> | 4.3* | 10.7* | 22.4* | 28.4* | 23.0* | 9.3 | 1.8 |
| <i>United States</i> | 4.2* | 14.0* | 26.7 | 28.9* | 18.8* | 6.3 | 1.1 |
| <i>Uruguay</i> | 19.7 | 27.2* | 29.3 | 17.1* | 5.6* | 1.0 | ‡ |
| <i>Vietnam</i> | 0.9!* | 5.8* | 20.7* | 37.5* | 27.0* | 7.1 | 1.0! |
| Education systems under the U.S. PISA national center | | | | | | | |
| <i>Connecticut</i> | 3.3* | 10.2* | 21.4* | 29.4* | 22.8* | 10.7 | 2.2 |
| <i>Florida</i> | 5.1* | 16.1* | 28.4 | 28.2* | 16.6* | 4.9 | ‡ |
| <i>Massachusetts</i> | 2.6* | 8.9* | 21.2* | 29.4* | 23.8* | 11.3 | 2.9 |

Rounds to zero.

! Interpret data with caution. Estimate is unstable due to high coefficient of variation.

‡ Reporting standards not met.

* p<.05. Significantly different from the Puerto Rico percentage at the .05 level of statistical significance.

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into science literacy levels according to their scores. Exact cut scores are as follows: below level 1 (a score less than or equal to 334.94); level 1 (a score greater than 334.94 and less than or equal to 409.54); level 2 (a score greater than 409.54 and less than or equal to 484.14); level 3 (a score greater than 484.14 and less than or equal to 558.73); level 4 (a score greater than 558.73 and less than or equal to 633.33); level 5 (a score greater than 633.33 and less than or equal to 707.93); and level 6 (a score greater than 707.93). Scores are reported on a scale from 0 to 1,000. The OECD average is the average of the national percentages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national percentages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Detail may not sum to totals because of rounding. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

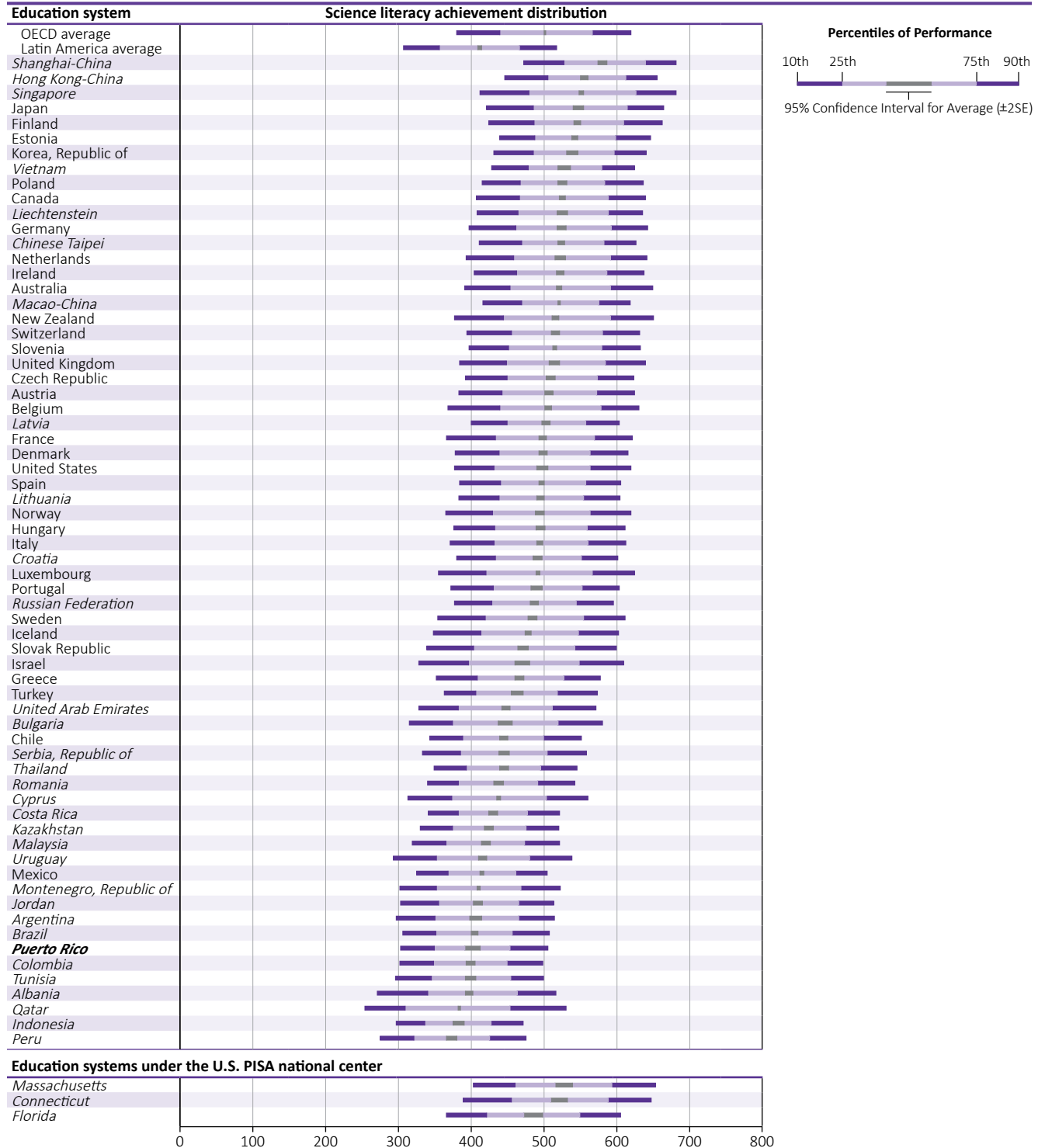
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Performance at Select Percentiles

- ▶ Figure 3 shows the distribution of achievement on the science literacy scale at select percentiles. Each country's percentile distribution is shown, allowing comparison of cut scores for high, low, and average performers in each education systems. Performance along percentiles also allows comparison of the distribution of achievement across education systems.
- ▶ The Puerto Rico average score at the 75th percentile was lower than the Latin America average score at the corresponding percentile. However, the Puerto Rico average scores at the 10th, 25th, and 90th percentiles were not measurably different from the Latin America average scores at the corresponding percentiles.
- ▶ Fifty-six education systems (including the U.S.) and the 3 education systems under the U.S. PISA national center of Massachusetts, Connecticut, and Florida had higher scores than Puerto Rico at the 90th percentile. Two education systems had scores lower than Puerto Rico at the 90th percentile and 7 education systems had scores not measurably different than Puerto Rico at the 90th percentile.
- ▶ Fifty-two education systems (including the U.S.) and the 3 education systems under the U.S. PISA national center of Massachusetts, Connecticut, and Florida had higher scores than Puerto Rico at the 10th percentile. Three education systems had lower scores than Puerto Rico at the 10th percentile and 10 education systems had scores not measurably different than Puerto Rico at the 10th percentile.
- ▶ The Puerto Rico 90th-10th percentile gap was 201 scale score points. This was smaller than the OECD average and U.S. 90th-10th percentile gaps but not measurably different than the Latin America average 90th-10th percentile gap. Thirty-six education systems (including the U.S.) and the 3 education systems under the U.S. PISA national center of Connecticut, Florida, and Massachusetts had 90th-10th percentile gaps larger than Puerto Rico. Only two education systems (Indonesia and Mexico) had 90th-10th percentile gaps smaller than Puerto Rico, and 27 education systems had 90th-10th percentile gaps not measurably different from Puerto Rico.

Figure 3. Distribution of achievement of 15-year-old students on PISA science literacy scale, by education system: 2012



NOTE: This figure shows the threshold (or cut) scores for the following: (a) 10th percentile- the bottom 10 percent of students; (b) 25th percentile- the bottom 25 percent of students; (d) 75th percentile- the top 25 percent of students; (e) 90th percentile- the top 10 percent of students. The percentile ranges are specific to each education system's distribution of scores, enabling users to compare cut scores across education systems. This figure also shows the 95% confidence interval for the average. The lower threshold (or cut) score for the 95% confidence interval for the average is the average score minus 2 standard errors. The upper threshold (or cut) score for the 95% confidence interval for the average is the average score plus 2 standard errors. Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Detail may not sum to totals because of rounding. Scores are reported on a scale from 0 to 1,000. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

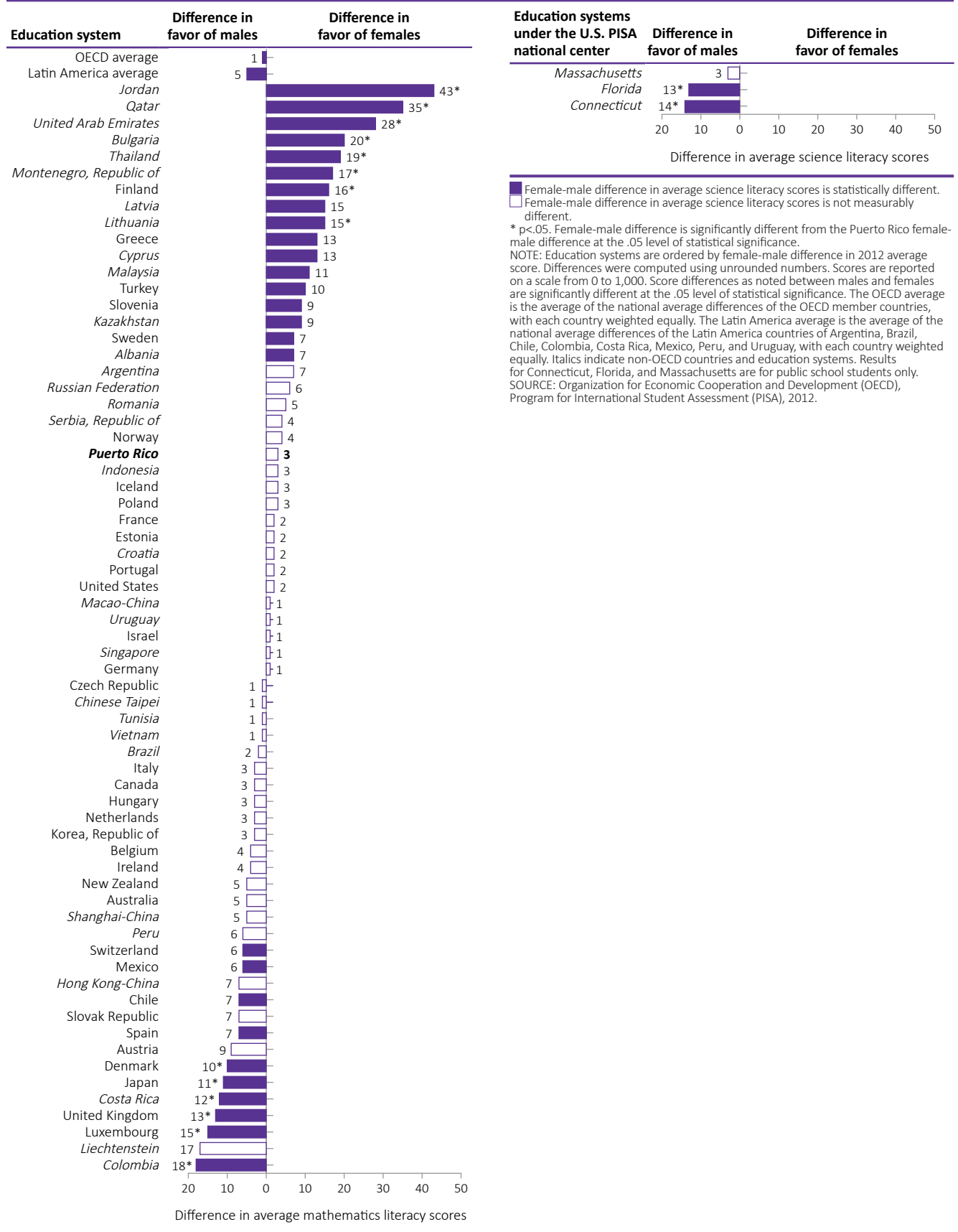
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Average Scores of Female and Male Students

- ▶ There was no measurable difference in the science literacy average scores of female and male students in Puerto Rico.
- ▶ The OECD average, Latin America average, and the U.S. had gender gaps not measurably different from Puerto Rico.
- ▶ Twenty-seven of 66 education systems, the OECD countries on average, the Latin America countries on average, and Florida and Connecticut had a significant gender gap on the science literacy scale. In 10 education systems, the OECD countries on average, the Latin America countries on average, and Florida and Connecticut, male students had a higher average score. In 17 education systems, the gender gap favored female students. However, there was no measurable gender gap in 39 education systems (including Puerto Rico) and Massachusetts.
- ▶ The gender gap ranged from 6 scale score points in Switzerland and Mexico, where male students had a higher average score, to 43 scale score points in Jordan, where female students had higher average scores.
- ▶ Fourteen education systems and Florida and Connecticut had gender gaps significantly different than that of Puerto Rico. However, most education systems (51, including the U.S.) and Massachusetts had gender gaps not measurably different from Puerto Rico.

Figure 4. Difference in average scores of 15-year-old female and male students on PISA science literacy scale, by education system: 2012



Reading Performance in Puerto Rico and Internationally

Average Score

- ▶ Average scores ranged from 570 in Shanghai-China to 384 in Peru.
- ▶ The Puerto Rico average was 404. This was lower than the OECD average, 53 education systems (including the U.S.), and the 3 education

systems under the U.S. PISA national center of Massachusetts, Connecticut, and Florida. The Puerto Rico average was higher than 2 education systems and not measurably different than the Latin America average and 10 education systems, including Uruguay, Brazil, Colombia, Argentina, Tunisia, Jordan, Malaysia, Indonesia, Albania, and Kazakhstan.

Table 8. Average scores of 15-year-old students on PISA reading literacy scale, by education system: 2012

| Education system | Average score | Education system | Average score |
|------------------------|---------------|--|---------------|
| OECD average | 496 ▲ | | |
| Latin America average | 414 | | |
| <i>Shanghai-China</i> | 570 ▲ | Iceland | 483 ▲ |
| <i>Hong Kong-China</i> | 545 ▲ | Slovenia | 481 ▲ |
| <i>Singapore</i> | 542 ▲ | <i>Lithuania</i> | 477 ▲ |
| Japan | 538 ▲ | Greece | 477 ▲ |
| Korea, Republic of | 536 ▲ | Turkey | 475 ▲ |
| Finland | 524 ▲ | <i>Russian Federation</i> | 475 ▲ |
| Ireland | 523 ▲ | Slovak Republic | 463 ▲ |
| Canada | 523 ▲ | <i>Cyprus</i> | 449 ▲ |
| <i>Chinese Taipei</i> | 523 ▲ | <i>Serbia, Republic of</i> | 446 ▲ |
| Poland | 518 ▲ | <i>United Arab Emirates</i> | 442 ▲ |
| Estonia | 516 ▲ | Chile | 441 ▲ |
| <i>Liechtenstein</i> | 516 ▲ | <i>Thailand</i> | 441 ▲ |
| New Zealand | 512 ▲ | <i>Costa Rica</i> | 441 ▲ |
| Australia | 512 ▲ | <i>Romania</i> | 438 ▲ |
| Netherlands | 511 ▲ | <i>Bulgaria</i> | 436 ▲ |
| Switzerland | 509 ▲ | Mexico | 424 ▲ |
| <i>Macao-China</i> | 509 ▲ | <i>Montenegro, Republic of</i> | 422 ▲ |
| Belgium | 509 ▲ | <i>Uruguay</i> | 411 |
| <i>Vietnam</i> | 508 ▲ | <i>Brazil</i> | 410 |
| Germany | 508 ▲ | <i>Tunisia</i> | 404 |
| France | 505 ▲ | Puerto Rico | 404 |
| Norway | 504 ▲ | <i>Colombia</i> | 403 |
| United Kingdom | 499 ▲ | <i>Jordan</i> | 399 |
| United States | 498 ▲ | <i>Malaysia</i> | 398 |
| Denmark | 496 ▲ | <i>Indonesia</i> | 396 |
| Czech Republic | 493 ▲ | <i>Argentina</i> | 396 |
| Italy | 490 ▲ | <i>Albania</i> | 394 |
| Austria | 490 ▲ | <i>Kazakhstan</i> | 393 |
| <i>Latvia</i> | 489 ▲ | <i>Qatar</i> | 388 ▼ |
| Hungary | 488 ▲ | <i>Peru</i> | 384 ▼ |
| Spain | 488 ▲ | | |
| Luxembourg | 488 ▲ | | |
| Portugal | 488 ▲ | | |
| Israel | 486 ▲ | | |
| <i>Croatia</i> | 485 ▲ | | |
| Sweden | 483 ▲ | | |
| | | Education systems under the U.S. PISA national center | |
| | | <i>Massachusetts</i> | 527 ▲ |
| | | <i>Connecticut</i> | 521 ▲ |
| | | <i>Florida</i> | 492 ▲ |

▲ Average score is higher than Puerto Rico average score.
▼ Average score is lower than Puerto Rico average score.

NOTE: Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Scores are reported on a scale from 0 to 1,000. All average scores reported as higher or lower than the Puerto Rico average score are different at the .05 level of statistical significance. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Performance at Reading Literacy Proficiency Levels

- ▶ Nearly all students in Puerto Rico scored at proficiency levels 4 or below.
- ▶ The percentages of Puerto Rico students scoring at proficiency levels 3 and 4 were lower than the OECD average and U.S. percentages but not measurably different than the Latin America average percentages.
- ▶ The percentage of Puerto Rico students scoring at proficiency level 2 was higher than the OECD average percentage but not measurably different than the Latin America average or U.S. percentages.
- ▶ The percentages of Puerto Rico students scoring at proficiency levels 1a, 1b, and below 1 were higher than the OECD average and U.S. percentages but not measurably different than the Latin America average percentages.

Table 9. Percentage distribution of 15-year-old students on PISA reading literacy scale, by proficiency level and education system: 2012

| Education system | Percent | | | | | | | |
|--|----------------|-------------|-------------|-------------|-------------|------------|----------|----------|
| | Below level 1b | level 1b | Level 1a | Level 2 | Level 3 | Level 4 | Level 5 | Level 6 |
| OECD average | 1.3* | 4.4* | 12.3* | 23.5* | 29.1* | 21.0* | 7.3 | 1.1 |
| Latin America average | 4.7 | 13.7 | 27.5 | 31.2 | 17.6 | 4.7 | 0.5 | #! |
| <i>Albania</i> | 12.0* | 15.9 | 24.4* | 24.7 | 15.9 | 5.9* | 1.1 | ‡ |
| <i>Argentina</i> | 8.1* | 17.7 | 27.7 | 27.3 | 14.6 | 4.0 | 0.5! | ‡ |
| <i>Australia</i> | 0.9* | 3.1* | 10.2* | 21.6* | 29.1* | 23.3* | 9.8 | 1.9 |
| <i>Austria</i> | 0.8* | 4.8* | 13.8* | 24.2* | 29.6* | 21.2* | 5.2 | 0.3 |
| <i>Belgium</i> | 1.6* | 4.1* | 10.4* | 20.4* | 27.3* | 24.4* | 10.4 | 1.4 |
| <i>Brazil</i> | 4.0 | 14.8 | 30.4 | 30.1 | 15.8 | 4.4 | 0.5 | ‡ |
| <i>Bulgaria</i> | 8.0 | 12.8 | 18.6* | 22.2* | 21.4* | 12.7* | 3.8 | 0.5! |
| <i>Canada</i> | 0.5* | 2.4* | 8.0* | 19.4* | 31.0* | 25.8* | 10.8 | 2.1 |
| <i>Chile</i> | 1.0* | 8.1* | 23.9* | 35.1* | 24.3* | 6.9* | 0.6 | ‡ |
| <i>Chinese Taipei</i> | 0.6* | 2.5* | 8.4* | 18.1* | 29.9* | 28.7* | 10.4 | 1.4 |
| <i>Colombia</i> | 5.0 | 15.4 | 31.0 | 30.5 | 14.5 | 3.2 | 0.3! | ‡ |
| <i>Costa Rica</i> | 0.8!* | 7.3* | 24.3* | 38.1* | 22.9* | 6.0* | 0.6! | ‡ |
| <i>Croatia</i> | 0.7!* | 4.0* | 13.9* | 27.8 | 31.2* | 17.8* | 4.2 | 0.2! |
| <i>Cyprus</i> | 6.1 | 9.7* | 17.0* | 25.1 | 24.9* | 13.2* | 3.5 | 0.5 |
| <i>Czech Republic</i> | 0.6!* | 3.5* | 12.7* | 26.4 | 31.3* | 19.4* | 5.3 | 0.8 |
| <i>Denmark</i> | 0.8!* | 3.1* | 10.7* | 25.8 | 33.6* | 20.5* | 5.1 | 0.4! |
| <i>Estonia</i> | ‡ | 1.3* | 7.7* | 22.7* | 35.0* | 24.9* | 7.5 | 0.9 |
| <i>Finland</i> | 0.7* | 2.4* | 8.2* | 19.1* | 29.3* | 26.8* | 11.3 | 2.2 |
| <i>France</i> | 2.1* | 4.9* | 11.9* | 18.9* | 26.3* | 23.0* | 10.6 | 2.3 |
| <i>Germany</i> | 0.5!* | 3.3* | 10.7* | 22.1* | 29.9* | 24.6* | 8.3 | 0.7! |
| <i>Greece</i> | 2.6* | 5.9* | 14.2* | 25.1 | 30.0* | 17.2* | 4.6 | 0.5 |
| <i>Hong Kong-China</i> | 0.2!* | 1.3* | 5.3* | 14.3* | 29.2* | 32.9* | 14.9 | 1.9 |
| <i>Hungary</i> | 0.7!* | 5.2* | 13.8* | 24.3 | 29.9* | 20.4* | 5.3 | 0.4! |
| <i>Iceland</i> | 2.3* | 5.4* | 13.3* | 24.7 | 29.9* | 18.6* | 5.2 | 0.6! |
| <i>Indonesia</i> | 4.1 | 16.3 | 34.8* | 31.6 | 11.5* | 1.5!* | ‡ | ‡ |
| <i>Ireland</i> | 0.3!* | 1.9* | 7.5* | 19.6* | 33.4* | 26.0* | 10.1 | 1.3 |
| <i>Israel</i> | 3.8 | 6.9* | 12.9* | 20.8* | 25.3* | 20.6* | 8.1 | 1.5 |
| <i>Italy</i> | 1.6* | 5.2* | 12.7* | 23.7* | 29.7* | 20.5* | 6.1 | 0.6 |
| <i>Japan</i> | 0.6* | 2.4* | 6.7* | 16.6* | 26.7* | 28.4* | 14.6 | 3.9 |
| <i>Jordan</i> | 7.5 | 14.9 | 28.3 | 30.8 | 15.5 | 2.9 | ‡ | ‡ |
| <i>Kazakhstan</i> | 4.2 | 17.3 | 35.6* | 31.3 | 10.4* | 1.2* | ‡ | ‡ |
| <i>Korea, Republic of</i> | 0.4* | 1.7* | 5.5* | 16.4* | 30.8* | 31.0* | 12.6 | 1.6 |
| <i>Latvia</i> | 0.7!* | 3.7* | 12.6* | 26.7 | 33.1* | 19.1* | 3.9 | 0.3! |
| <i>Liechtenstein</i> | ‡ | ‡ | 10.5* | 22.4 | 28.6* | 25.7* | 10.4 | ‡ |
| <i>Lithuania</i> | 1.0* | 4.6* | 15.6* | 28.1 | 31.1* | 16.3* | 3.1 | 0.2! |
| <i>Luxembourg</i> | 2.0* | 6.3* | 13.8* | 23.4* | 25.8* | 19.7* | 7.5 | 1.4 |
| <i>Macao-China</i> | 0.3!* | 2.1* | 9.0* | 23.3* | 34.3* | 24.0* | 6.4 | 0.6! |
| <i>Malaysia</i> | 5.8 | 16.4 | 30.5 | 31.0 | 13.6 | 2.5 | ‡ | ‡ |
| <i>Mexico</i> | 2.6* | 11.0* | 27.5 | 34.5* | 19.6* | 4.5 | 0.4 | ‡ |
| <i>Montenegro, Republic of</i> | 4.4 | 13.2 | 25.7 | 29.2 | 19.9* | 6.6* | 0.9 | ‡ |
| <i>Netherlands</i> | ‡ | 2.8* | 10.3* | 21.0* | 29.2* | 26.1* | 9.0 | 0.8 |
| <i>New Zealand</i> | 1.3* | 4.0* | 11.0* | 20.8* | 26.3* | 22.7* | 10.9 | 3.0 |
| <i>Norway</i> | 1.7* | 3.7* | 10.8* | 21.9* | 29.4* | 22.3* | 8.5 | 1.7 |
| <i>Peru</i> | 9.8* | 20.6 | 29.5 | 24.9 | 11.4* | 3.3 | 0.5! | ‡ |
| <i>Poland</i> | 0.3!* | 2.1* | 8.1* | 21.4* | 32.0* | 26.0* | 8.6 | 1.4 |
| <i>Portugal</i> | 1.3* | 5.1* | 12.3* | 25.5 | 30.2* | 19.7* | 5.3 | 0.5! |
| Puerto Rico | 5.1 | 16.7 | 29.8 | 28.5 | 16.1 | 3.6 | ‡ | ‡ |
| <i>Qatar</i> | 13.6* | 18.9 | 24.6* | 21.9* | 13.5 | 5.8* | 1.4 | 0.2 |
| <i>Romania</i> | 2.5* | 10.3* | 24.4* | 30.6 | 21.8* | 8.7* | 1.5 | ‡ |
| <i>Russian Federation</i> | 1.1* | 5.2* | 16.0* | 29.5 | 28.3* | 15.3* | 4.2 | 0.5 |
| <i>Serbia, Republic of</i> | 2.6* | 9.3* | 21.3* | 30.8 | 23.3* | 10.5* | 2.0 | 0.2! |
| <i>Shanghai-China</i> | ‡ | 0.3!* | 2.5* | 11.0* | 25.3* | 35.7* | 21.3 | 3.8 |
| <i>Singapore</i> | 0.5* | 1.9* | 7.5* | 16.7* | 25.4* | 26.8* | 16.2 | 5.0 |
| <i>Slovak Republic</i> | 4.1 | 7.9* | 16.2* | 25.0 | 26.8* | 15.7* | 4.1 | ‡ |
| <i>Slovenia</i> | 1.2* | 4.9* | 15.0* | 27.2 | 28.4* | 18.2* | 4.7 | 0.3! |
| <i>Spain</i> | 1.3* | 4.4* | 12.6* | 25.8 | 31.2* | 19.2* | 5.0 | 0.5 |
| <i>Sweden</i> | 2.9* | 6.0* | 13.9* | 23.5* | 27.3* | 18.6* | 6.7 | 1.2 |
| <i>Switzerland</i> | 0.5* | 2.9* | 10.3* | 21.9* | 31.5* | 23.8* | 8.2 | 1.0 |
| <i>Thailand</i> | 1.2* | 7.7* | 24.1* | 36.0* | 23.5* | 6.7* | 0.8 | ‡ |
| <i>Tunisia</i> | 6.2 | 15.5 | 27.6 | 31.4 | 15.6 | 3.5 | ‡ | ‡ |
| <i>Turkey</i> | 0.6* | 4.5* | 16.6* | 30.8 | 28.7* | 14.5* | 4.1 | 0.3! |
| <i>United Arab Emirates</i> | 3.3 | 10.4* | 21.8* | 28.6 | 24.0* | 9.7* | 2.1 | 0.2! |
| <i>United Kingdom</i> | 1.5* | 4.0* | 11.2* | 23.5* | 29.9* | 21.3* | 7.5 | 1.3 |
| <i>United States</i> | 0.8!* | 3.6* | 12.3* | 24.9 | 30.5* | 20.1* | 6.9 | 1.0 |
| <i>Uruguay</i> | 6.4 | 14.7 | 25.9 | 28.9 | 17.4 | 5.7* | 0.9 | ‡ |
| <i>Vietnam</i> | ‡ | 1.5!* | 7.8* | 23.7* | 39.0* | 23.4* | 4.2 | 0.4! |
| Education systems under the U.S. PISA national center | | | | | | | | |
| <i>Connecticut</i> | ‡ | 3.2* | 9.7* | 19.6* | 28.2* | 24.4* | 11.7 | 2.9 |
| <i>Florida</i> | 0.7!* | 3.6* | 13.2* | 25.8 | 30.9* | 20.4* | 4.9 | ‡ |
| <i>Massachusetts</i> | ‡ | 2.3* | 8.6* | 18.5* | 29.8* | 24.2* | 12.9 | 3.2 |

Rounds to zero.

! Interpret data with caution. Estimate is unstable due to high coefficient of variation.

‡ Reporting standards not met.

* p < .05. Significantly different from the Puerto Rico percentage at the .05 level of statistical significance.

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into reading literacy levels according to their scores. Exact cut scores are as follows: below level 1b (a score less than or equal to 262.04); level 1b (a score greater than 262.04 and less than or equal to 334.75); level 1a (a score greater than 334.75 and less than or equal to 407.47); level 2 (a score greater than 407.47 and less than or equal to 480.18); level 3 (a score greater than 480.18 and less than or equal to 552.89); level 4 (a score greater than 552.89 and less than or equal to 625.61); level 5 (a score greater than 625.61 and less than or equal to 698.32); and level 6 (a score greater than 698.32). Scores are reported on a scale from 0 to 1,000. The OECD average is the average of the national percentages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national percentages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Detail may not sum to totals because of rounding. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

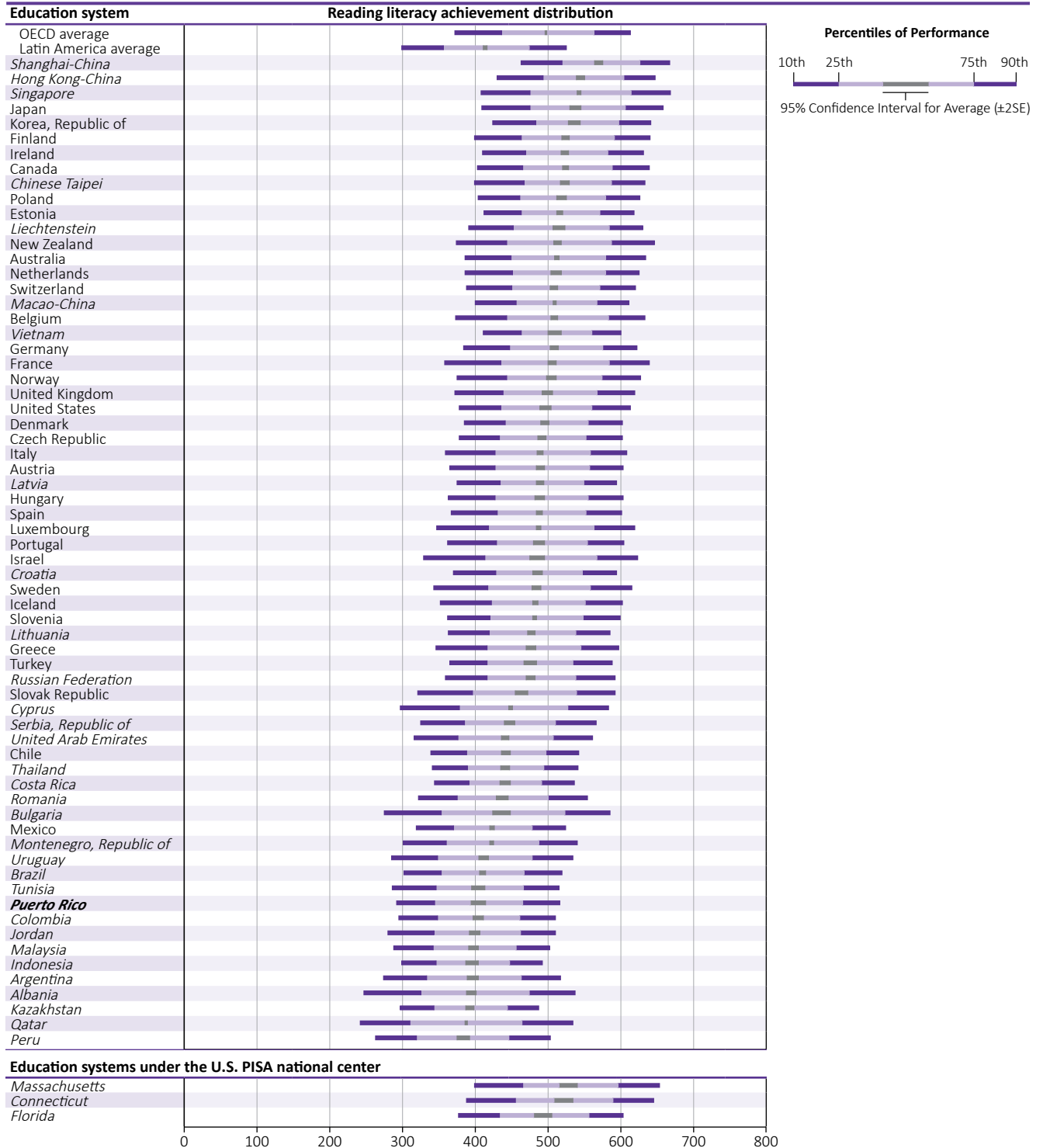
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Performance at Select Percentiles

- ▶ Figure 5 shows the distribution of achievement on the reading literacy scale at select percentiles. Each country's percentile distribution is shown, allowing comparison of cut scores for high, low, and average performers in each education systems. Performance along percentiles also allows comparison of the distribution of achievement across education systems.
- ▶ The Puerto Rico average reading score at the 25th percentile was lower than the Latin America average score at the corresponding percentile. However, the Puerto Rico average reading scores at the 10th, 75th, and 90th percentiles were not measurably different from the Latin America average scores at the corresponding percentiles.
- ▶ Fifty-five education systems (including the U.S.) and the 3 education systems under the U.S. PISA national center of Massachusetts, Connecticut, and Florida had higher scores than Puerto Rico at the 90th percentile. Two education systems had scores lower than Puerto Rico at the 90th percentile and 8 education systems had scores not measurably different than Puerto Rico at the 90th percentile.
- ▶ Fifty education systems (including the U.S.) and the 3 education systems under the U.S. PISA national center of Massachusetts, Connecticut, and Florida had higher scores than Puerto Rico at the 10th percentile. Four education systems had lower scores than Puerto Rico at the 10th percentile and 11 education systems had scores not measurably different than Puerto Rico at the 10th percentile.
- ▶ The Puerto Rico 90th-10th percentile gap was 224 scale score points. This was not measurably different than the OECD average, Latin America average, and U.S. 90th-10th percentile gaps. Twenty education systems and Connecticut, and Massachusetts had 90th-10th percentile gaps larger than Puerto Rico. Six education systems had 90th-10th percentile gaps smaller than Puerto Rico and 39 education systems (including the U.S.) and Florida had 90th-10th percentile gaps not measurably different than Puerto Rico.

Figure 5. Distribution of achievement of 15-year-old students on PISA reading literacy scale, by education system: 2012



NOTE: This figure shows the threshold (or cut) scores for the following: (a) 10th percentile- the bottom 10 percent of students; (b) 25th percentile- the bottom 25 percent of students; (d) 75th percentile- the top 25 percent of students; (e) 90th percentile- the top 10 percent of students. The percentile ranges are specific to each education system's distribution of scores, enabling users to compare cut scores across education systems. This figure also shows the 95% confidence interval for the average. The lower threshold (or cut) score for the 95% confidence interval for the average is the average score minus 2 standard errors. The upper threshold (or cut) score for the 95% confidence interval for the average is the average score plus 2 standard errors. Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Detail may not sum to totals because of rounding. Scores are reported on a scale from 0 to 1,000. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

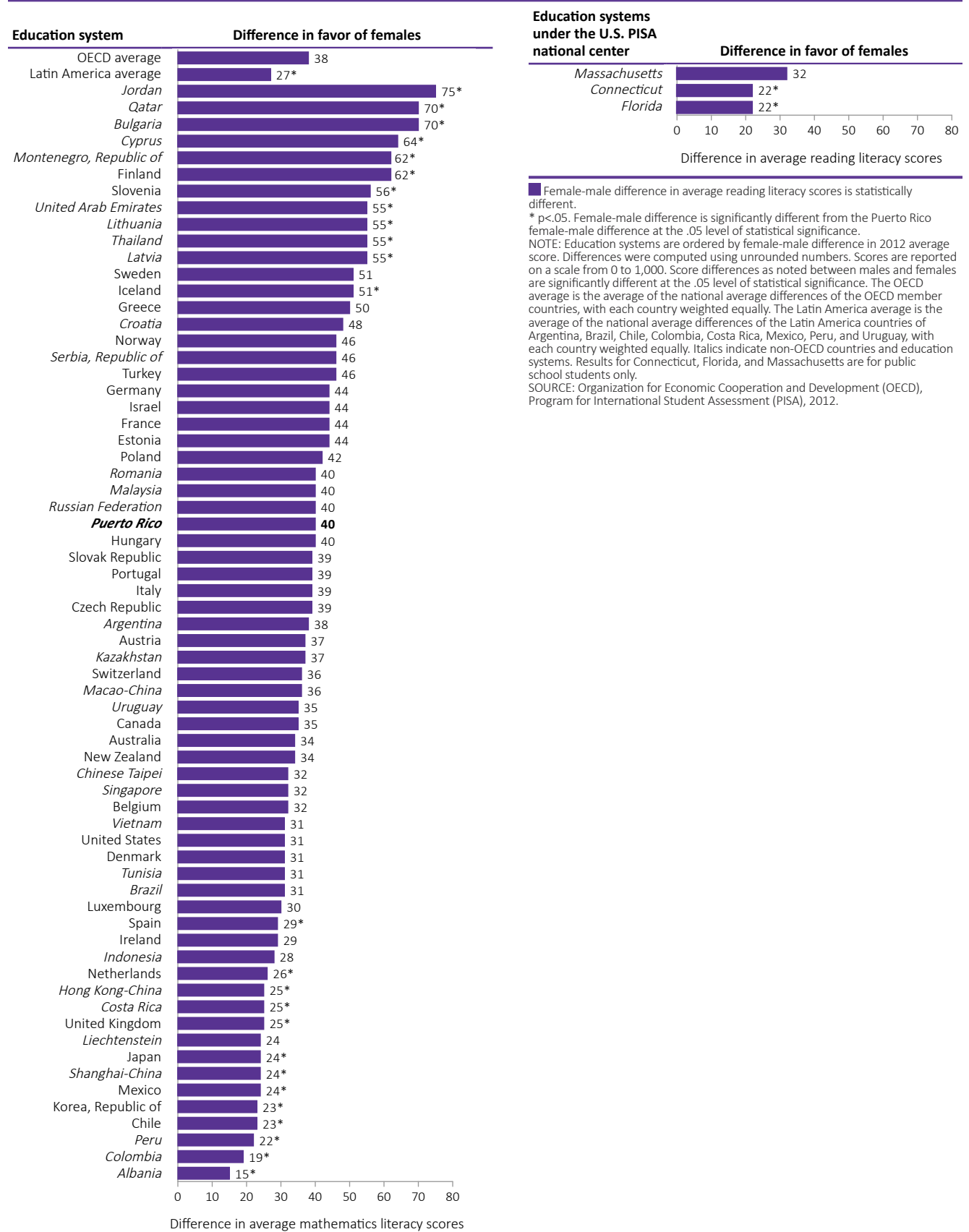
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Average Scores of Female and Male Students

- ▶ On average, female students scored higher than male students by 40 scale score points in Puerto Rico on the reading literacy scale.
- ▶ The Latin America average had a gender gap smaller than that of Puerto Rico, while the U.S. and OECD average gender gaps not measurably different than Puerto Rico.
- ▶ All participating education systems, the OECD countries on average, and the Latin America countries on average had a significant gender gap in reading literacy in favor of females.
- ▶ The gender gap ranged from 15 scale score points in Albania to 75 scale score points in Jordan.
- ▶ Twenty-five education systems and Connecticut and Florida had a gender gap significantly different than that of Puerto Rico. However, 40 education systems (including the U.S.) and Massachusetts, had gender gaps not measurably different from Puerto Rico.

Figure 6. Difference in average scores of 15-year-old female and male students on PISA reading literacy scale, by education system: 2012

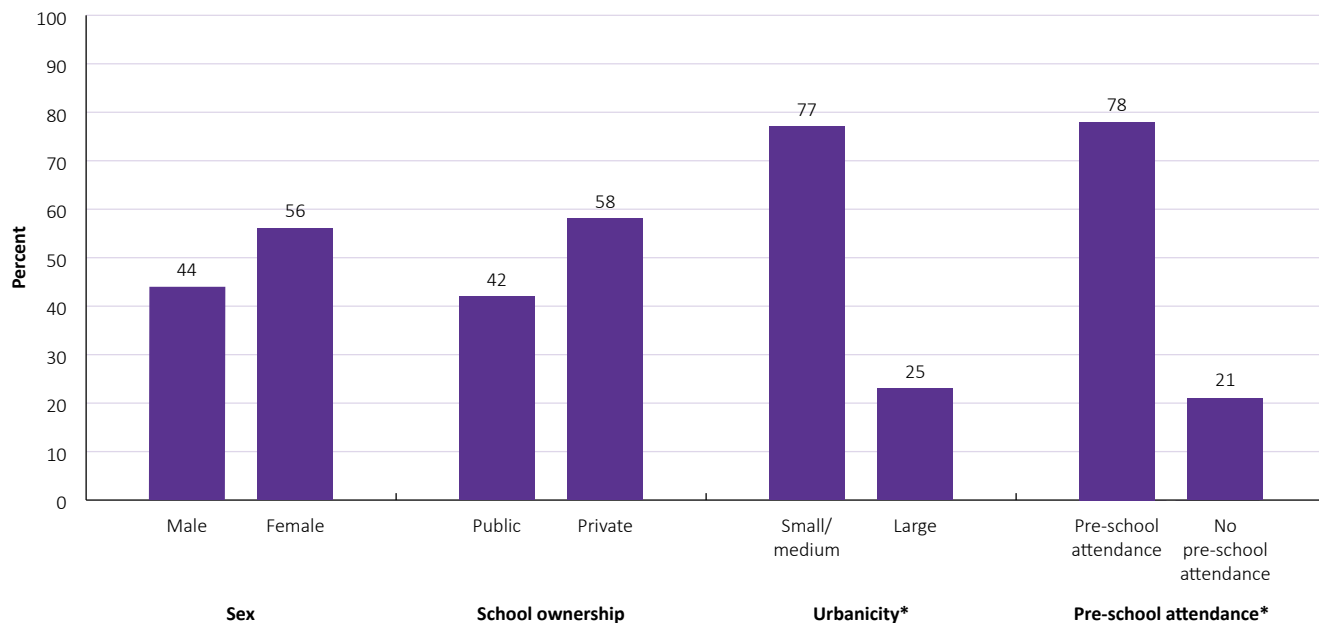


Performance in Puerto Rico and Beyond: Focus on Mathematics

Profile of the Top 10 Percent of Students in Mathematics Literacy in Puerto Rico

- ▶ The PISA student and school questionnaires provide valuable background information on 15-year-olds in Puerto Rico. Figure 7 uses data from the student and school questionnaires to show a basic profile of what the top 10 percent of students in Puerto Rico looks like. The demographic variables in this figure were chosen because they often related closely to student achievement (OECD 2013b).
- ▶ Figure 7 breaks down the top 10 percent of students in mathematics literacy in Puerto Rico by sex (male or female), school ownership (students in public or private schools), urbanicity (students in schools located in small/medium populations of less than 100,000 or large populations of 100,000 or greater), and pre-school attendance (the student attended pre-school or did not attend pre-school).
- ▶ The portion of females in the top 10 percent in mathematics literacy was not measurably different from the portion of males in the top 10 percent. Forty-four percent of the top 10 percent was male and 56 percent was female.
- ▶ Similarly, the portion of public school students in the top 10 percent in mathematics literacy was not measurably different from the portion of private school students in the top 10 percent. Forty-two percent of the top 10 percent in mathematics literacy came from public schools and 58 percent came from private schools.
- ▶ Differences in the top 10 percent in mathematics literacy were found in terms of urbanicity: A larger portion of the top 10 percent in mathematics literacy came from areas with small/medium populations than from areas with large populations. Seventy-seven percent of the top 10 percent came from areas with medium/small populations while only 23 percent of the top 10 percent came from areas with large populations.
- ▶ Differences in the top 10 percent in mathematics literacy were also found in terms of pre-school attendance: A larger portion of the top 10 percent in mathematics literacy attended pre-school versus those who did not. Seventy-eight percent of the top 10 percent attended pre-school while only 21 percent of the top 10 percent did not attend pre-school.

Figure 7: Profile of the top 10 percent of students in Puerto Rico in mathematics literacy, by various demographic categories: 2012



* $p < .05$. Difference between the percentages is significantly different at the .05 level of statistical significance.

NOTE: The categories for urbanicity were derived from a question in the school questionnaire asking principals to categorize the size of the community in which their school was located. A large population is defined as 100,000 people or more and a medium/small population is defined as less than 100,000 people. Detail may not sum to totals because of non-response to questionnaire items.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Performance at Upper and Lower Quartiles of Select Socioeconomic Indices

- ▶ Figure 8 focuses on the mathematics literacy performance of Puerto Rico students at the upper and lower quartiles of select socioeconomic indices and compares the Puerto Rico score gaps between the upper and lower quartile at these indices to the Latin America average score gaps. This allows comparison of how scores in Puerto Rico differ from scores in Latin America countries on average along a common socioeconomic index.
- ▶ The indices covered include the economic, social, and cultural status (ESCS) index, the quality of schools' education resources index, and the quality of schools' physical infrastructure index. Details on the indices used can be found in appendix A. Individual level and school level socioeconomic indices that focus on resources and infrastructure were chosen because they represent pertinent issues when it comes to student achievement in Puerto Rico.
- ▶ The ESCS index captures a range of aspects of a student's family and home background that combines information on parents' education and occupations and home possessions. The score gap between the upper and lower quartile on the ESCS index indicates the difference in performance between those students from families with comparatively advantaged socioeconomic backgrounds with those students from families with comparatively disadvantaged socioeconomic backgrounds.
- ▶ The Puerto Rico score gap for mathematics literacy on the ESCS index was 59 scale score points. This was significantly smaller than the Latin America score gap of 88 scale score points.
- ▶ The quality of schools' education resources index captures school principals' perceptions of factors hindering instruction at their school, including shortage of equipment, instructional materials, computers, Internet connectivity, computer software, and library materials. The

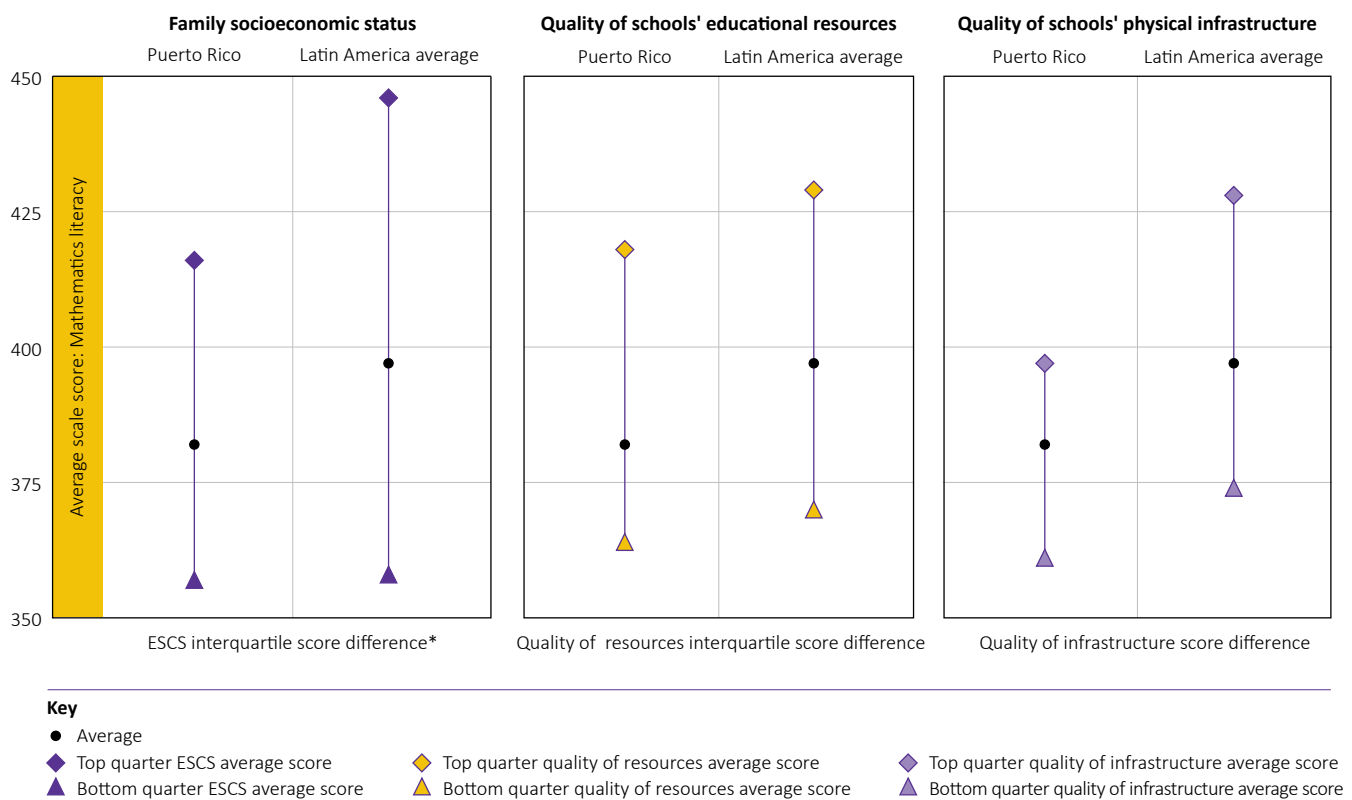
score gap between the upper and lower quartile on the education resources index indicates the difference in performance between those students from schools with comparatively better education resources and those with comparatively worse education resources.

- ▶ The Puerto Rico score gap for mathematics literacy on the quality of schools' education resources index was 54. This was not measurably different than the Latin America score gap of 58.
- ▶ The quality of schools' physical infrastructure index captures school principals' perceptions

of factors hindering instruction at their school, including inadequacy of school buildings, building infrastructure, and instructional space. The score gap between the upper and lower quartile on the physical infrastructure index indicates the difference in performance between those students from schools with comparatively better physical infrastructure and those with comparatively worse physical infrastructure.

- ▶ The Puerto Rico score gap for mathematics literacy on the quality of schools' physical infrastructure index was 35. This was not measurably different than the Latin America score gap of 54.

Figure 8: Average scores of Puerto Rico and Latin America 15-year-old students on PISA mathematics literacy scale, by top and bottom quarters of select indices: 2012



* $p < .05$. Difference between the Puerto Rico interquartile score difference and the Latin America average interquartile score difference is significantly different at the .05 level of statistical significance.
NOTE: Interquartile score differences are presented for the PISA index of economic, social, and cultural status (ESCS), the index of quality of schools' educational resources, and the index of quality of schools' physical infrastructure. Details on these indices can be found in Appendix A. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Scores are reported on a scale from 0 to 1,000.
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Comparison of Puerto Rico and U.S. Hispanic Mathematics Literacy Performance

- ▶ Table 10 compares the mathematics literacy performance of Puerto Rico students to U.S. Hispanic students. U.S. Hispanic students provide a natural comparison group for Puerto Rico students due to their similar ethnic and cultural background.
- ▶ Overall performance and performance by sex (male or female), school ownership (students in public or private schools), and the percentage of public school students eligible for free or reduced-price lunch (students in public schools with less than 50 percent and 50 percent or more students eligible for free or reduced-price lunch) are examined.
- ▶ The U.S. Hispanic average score (455) was significantly higher than the Puerto Rico average score (382) by 73 scale score points.
- ▶ The U.S. Hispanic female average score (450) was significantly higher than the Puerto Rico female

average score (377) by 73 scale score points. Similarly, the U.S. Hispanic male average score (460) was significantly higher than the Puerto Rico male average score (387) by 73 scale score points.

- ▶ The U.S. Hispanic public school student average score (455) was significantly higher than the Puerto Rico public school student average score (370) by 85 scale score points. The U.S. Hispanic private school student average score (477) was significantly higher than the Puerto Rico private school student average score (424) by 53 scale score points.
- ▶ For public schools where less than half of students were eligible for free or reduced-price lunch, the average score of U.S. Hispanic students (495) was higher than the average score of Puerto Rico students (399) by 96 scale score points. For public schools where half or more of students were eligible for free or reduced-price lunch, the average score of U.S. Hispanic students (441) was higher than the average score of Puerto Rico students (369) by 72 scale score points.

Table 10. Average scores of 15-year-old students on PISA mathematics literacy scale for Puerto Rico students and U.S. Hispanic students, by various subgroups: 2012

| Reporting groups | Average score | | |
|---|---------------|---------------|--------------------------------------|
| | Puerto Rico | U.S. Hispanic | Puerto Rico-U.S. Hispanic difference |
| Overall average | 382 | 455 | -73 * |
| Sex | | | |
| Female | 377 | 450 | -73 * |
| Male | 387 | 460 | -73 * |
| Public/Private | | | |
| Public | 370 | 455 | -85 * |
| Private | 424 | 477 | -53 * |
| Percentage of public school students eligible for free or reduced-price lunch | | | |
| Less than 50 percent | 399 | 495 | -96 * |
| 50 percent or more | 369 | 441 | -72 * |

* p<.05. Puerto Rico-U.S. Hispanic scores are significantly different.

NOTE: Scores are reported on a scale from 0 to 1,000. U.S. students who identified themselves as being of Hispanic origin were classified as Hispanic, regardless of their race. The National School Lunch Program provides free or reduced-price lunch for students meeting certain income guidelines. The percentage of students receiving such lunch is an indicator of the socioeconomic level of families served by the school. Free or reduced-price lunch data are for public schools only. Free or reduced-price lunch data in this table are based on principals' responses to a question in the school questionnaire that asked the approximate percentage of eligible students in the school during the previous school year.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment, 2012.



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Appendix A: Methodology and Technical Notes

This appendix describes features of the PISA 2012 methodology, including sample design, test design, and scoring, with a particular focus on implementation in Puerto Rico. For further details about the assessment and any of the topics discussed here, see the OECD's *PISA 2012 Technical Report* (forthcoming).

International Requirements for Sampling, Data Collection, and Response Rates

OECD required all participating education systems to adhere to the PISA 2012 technical standards (OECD forthcoming), which provided detailed information about the target population, sampling, response rates, translation, assessment administration, and data submission. According to the standards, the international desired population in each education system consisted of 15-year-olds attending both publicly and privately controlled schools in grade 7 and higher. To provide valid estimates of student achievement and characteristics, the sample of PISA students had to be selected in a way that represented the full population of 15-year-old students in each education system. The sample design for PISA 2012 was a stratified systematic sample, with sampling probabilities proportional to the estimated number of 15-year-old students in the school based on grade enrollments. Samples were drawn using a two-stage sampling process. The first stage was a sample of schools, and the second stage was a sample of students within schools. The PISA international contractors responsible for the design and implementation of PISA internationally (hereafter referred to as the PISA consortium) drew the sample of schools for each education system.

A minimum of 4,500 students from a minimum of 150 schools was required in each country. However, for non-national entities such as Puerto Rico, a minimum of 1,500 students from a minimum of 50 schools was required. Following the PISA consortium guidelines, replacement schools were identified at the same time the PISA sample was selected by assigning the two schools neighboring the sampled school in the frame as replacements. The international guidelines specified that within schools, a sample of 35 students was to be selected in an equal probability sample

unless fewer than 35 students age 15 were available (in which case all 15-year-old students were selected).

Each education system collected its own data, following international guidelines and specifications. The technical standards required that students in the sample be 15 years and 3 months to 16 years and 2 months at the beginning of the testing period. The maximum length of the testing period was 42 days. Most education systems conducted testing from March through August 2012.¹

The school response-rate target was 85 percent for all education systems. A minimum of 65 percent of schools from the original sample of schools was required to participate for an education system's data to be included in the international database. Education systems were allowed to use replacement schools (selected during the sampling process) to increase the response rate once the 65 percent benchmark had been reached.

The technical standards also required a minimum participation rate of 80 percent of sampled students from schools (sampled and replacement) within each education system. This target applies in aggregate, not to each individual school. Follow-up sessions were required in schools where too few students participated in the originally scheduled test sessions to ensure a high overall student response rate. Replacement students within a school were not allowed. A student was considered to be a participant if he or she participated in the first testing session or a follow-up or makeup testing session. Data from education systems not meeting this requirement could be excluded from international reports.² See appendix B for final response rates by education system.

¹ The United States and United Kingdom were given permission to move the testing dates to September through November in an effort to improve response rates. The range of eligible birth dates was adjusted so that the mean age remained the same (i.e., 15 years and 3 months to 16 years and 2 months at the beginning of the testing period). In 2003, the United States conducted PISA in the spring and fall and found no significant difference in student performance between the two time points.

² Since Puerto Rico participated in PISA as a research study, its data is not included in international reports or the international database. Thus, Puerto Rico was not subject to the requirements for inclusion in international reports or databases. However, Puerto Rico did meet the standards for school participation rate and student participation within schools.

PISA 2012 was designed to be as inclusive as possible. The guidelines allowed schools to be excluded for approved reasons (for example, schools in remote regions, very small schools, or special education schools). Schools used the following international guidelines on student exclusions:

- ▶ **Students with functional disabilities.** These were students with a moderate to severe permanent physical disability such that they cannot perform in the PISA testing environment.
- ▶ **Students with intellectual disabilities.** These were students with a mental or emotional disability and who have been tested as cognitively delayed or who are considered in the professional opinion of qualified staff to be cognitively delayed such that they cannot perform in the PISA testing environment.
- ▶ **Students with insufficient language experience.** These were students who meet the three criteria of not being native speakers in the assessment language, having limited proficiency in the assessment language, and having less than 1 year of instruction in the assessment language.

Overall estimated exclusions (including both school and student exclusions) were to be under 5 percent of the PISA target population.

Sampling and Data Collection in Puerto Rico

The PISA 2012 school sample was drawn for Puerto Rico by the PISA consortium, and the data for the sample was supplied by the Puerto Rico Department of Education. The Puerto Rico PISA sample had no explicit stratification. The frame was implicitly stratified by control of school (public or private); grade range of the school (schools with grades 9 through 12, schools with grades 10 through 12, and all other schools); region of the country (Mayagüez, Bayamón, San Juan, Caguas, Humacao, Arecibo, and Ponce); and type of location relative to populous areas (suburb and rural).³

The Puerto Rico national school sample consisted of 60 schools. This number was increased from the

international minimum requirement of 50 to offset school nonresponse and reduce design effects. Schools were selected with probability proportionate to the school's estimated enrollment of 15-year-olds. Any school containing at least one 7th- through 12th-grade class was included in the school sampling frame. Participating schools provided a list of 15-year-old students (typically in August or September 2012) from which the sample was drawn using sampling software provided by the PISA consortium.

Within each participating school, 42 students aged 15 were randomly sampled within each school. If fewer than 42 age-eligible students were enrolled, all 15-year-old students in a school were selected. Thus, in each school, each age-eligible student had an equal probability of being selected. Sampled students were born between July 1, 1996, and June 30, 1997 (hereafter the sampled students are referred to as "15-year-olds" or "15-year-old students").

Test Development

The 2012 assessment instruments were developed by international experts and PISA consortium test developers and included items submitted by participating education systems. Items were reviewed by representatives of each country for possible bias and relevance to PISA's goals and the PISA subject-matter expert groups. Although assessment items were not field-tested in Puerto Rico, they were field-tested in all other education systems shown in this report in spring 2011.

The final paper-based assessment for Puerto Rico consisted of 85 mathematics items, 44 reading items, and 53 science items allocated to 13 test booklets. Each booklet was made up of four test clusters. Altogether there were seven mathematics clusters, three reading clusters, and three science clusters. The mathematics, science, and reading clusters were allocated in a rotated design to 13 booklets. The average number of items per cluster was 12 items for mathematics, 15 items for reading, and 18 items for science. Each cluster was designed to average 30 minutes of test material. Each student took one booklet,

³ These types are defined as follows: (1) "suburb" is a territory inside an urbanized area with a core population of 50,000 or more and outside a principal city and (2) "rural" is territory not in an urbanized area or urban cluster. Type of location was not available for private schools.

with about 2 hours' worth of testing material. Approximately half of the items were multiple-choice, about 20 percent were closed- or short-response types (for which students wrote an answer that was simply either correct or incorrect), and about 30 percent were open-constructed responses (for which students wrote answers that were graded by trained scorers using an international scoring guide). Every student answered mathematics items. Not all students answered reading or science items.

In addition to the cognitive assessment, students also completed a 30-minute questionnaire designed to provide information about their backgrounds, attitudes, and experiences in school. Principals in schools where PISA was administered also completed a 30-minute questionnaire about their schools.

Translation and Adaptation

Source versions of all instruments (assessment booklets, questionnaires, and manuals) were prepared in English and French and translated into the primary language or languages of instruction in each education system. The PISA consortium recommended that education systems prepare and consolidate independent translations from both source versions and provided precise translation guidelines that included a description of the features each item was measuring and statistical analysis from the field trial. In cases for which one source language was used, independent translations were required and discrepancies reconciled. In addition, it was sometimes necessary to adapt the instrument for cultural purposes. In Puerto Rico, Spanish instruments were adapted for Puerto Rico and a committee of Puerto Rico educators then reviewed all instruments. The purpose of the reviews was to ensure the materials consisted of commonly used Spanish in Puerto Rico. The PISA consortium verified the national adaptation of all instruments. Electronic copies of printed materials were sent to the PISA consortium for a final visual check prior to data collection.

Test Administration and Quality Assurance

The PISA consortium emphasized the use of standardized procedures in all education systems.

Each education system collected its own data, based on a manual provided by the PISA consortium (ACER 2011) that explained the survey's implementation, including precise instructions for the work of school coordinators and scripts for test administrators to use in testing sessions. Test administration in Puerto Rico was conducted by professional staff trained in accordance with the international guidelines. Students were allowed to use calculators, and Puerto Rico students were provided calculators.

In a sample of schools in each education system, a PISA Quality Monitor (PQM) who was engaged by the PISA consortium observed test administrations. The sample schools were selected jointly by the PISA consortium and the PQM. In Puerto Rico, there was one PQM who observed seven schools. The PQM's primary responsibility was to document the extent to which testing procedures in schools were implemented in accordance with test administration procedures. The PQM's observations in Puerto Rico schools indicated that international procedures for data collection were applied consistently.

Weighting

The use of sampling weights is necessary for the computation of statistically sound, nationally representative estimates. Adjusted survey weights adjust for the probabilities of selection for individual schools and students, for school or student nonresponse, and for errors in estimating the size of the school or the number of 15-year-olds in the school at the time of sampling. Survey weighting for all education systems participating in PISA 2012 was coordinated by Westat, as part of the PISA consortium.

The school base weight was defined as the reciprocal of the school's probability of selection multiplied by the number of eligible students in the school. (For replacement schools, the school base weight was set equal to the original school it replaced.) The student base weight was given as the reciprocal of the probability of selection for each selected student from within a school.

The product of these base weights was then adjusted for school and student nonresponse. The school nonresponse adjustment was done individually

for each education system by cross-classifying the explicit and implicit stratification variables defined as part of the sample design. Usually about 10 to 15 such cells were formed per education system.

The student nonresponse adjustment was done within cells based first on their school nonresponse cell and their explicit stratum; within that, grade and sex were used when possible. All PISA analyses were conducted using these adjusted sampling weights. For more information on the nonresponse adjustments, see OECD's *PISA 2012 Technical Report* (forthcoming).

Scaling of Student Test Data

Each test booklet or computerized version had a different subset of items. The fact that each student completed only a subset of items means that classical test scores, such as the percentage correct, are not accurate measures of student performance. Instead, scaling techniques were used to establish a common scale for all students. For PISA 2012, item response theory (IRT) was used to estimate average scores for mathematics, science, and reading literacy for each education system, as well as for three mathematics process and four mathematics content scales.

IRT identifies patterns of response and uses statistical models to predict the probability of answering an item correctly as a function of the students' proficiency in answering other questions. With this method, the performance of a sample of students in a subject area or subarea can be summarized on a simple scale or series of scales, even when students are administered different items.

Scores for students are estimated as plausible values because each student completed only a subset of items. Five plausible values were estimated for each student for each scale. These values represent the distribution of potential scores for all students in the population with similar characteristics and identical patterns of item response. Statistics describing performance on the PISA reading, mathematics, and science literacy scales are based on plausible values.

Proficiency Levels

In addition to a range of scale scores as the basic form of measurement, PISA describes student proficiency in terms of levels. Higher levels represent

the knowledge, skills, and capabilities needed to perform tasks of increasing complexity. PISA results are reported in terms of percentages of the student population at each of the predefined levels.

To determine the performance levels and cut scores on the literacy scales, IRT techniques were used. With IRT techniques, it is possible to simultaneously estimate the ability of all students taking the PISA assessment, as well as the difficulty of all PISA items. Estimates of student ability and item difficulty can then be mapped on a single continuum. The relative ability of students taking a particular test can be estimated by considering the percentage of test items they get correct. The relative difficulty of items in a test can be estimated by considering the percentage of students getting each item correct. In PISA, all students within a level are expected to answer at least half of the items from that level correctly. Students at the bottom of a level are able to provide the correct answers to about 52 percent of all items from that level, have a 62 percent chance of success on the easiest items from that level, and have a 42 percent chance of success on the most difficult items from that level. Students in the middle of a level have a 62 percent chance of correctly answering items of average difficulty for that level (an overall response probability of 62 percent). Students at the top of a level are able to provide the correct answers to about 70 percent of all items from that level, have a 78 percent chance of success on the easiest items from that level, and have a 62 percent chance of success on the most difficult items from that level. Students just below the top of a level would score less than 50 percent on an assessment at the next higher level. Students at a particular level demonstrate not only the knowledge and skills associated with that level but also the proficiencies defined by lower levels. Patterns of responses for students below level 1b for reading literacy and below level 1 for mathematics and science literacy suggest that these students are unable to answer at least half of the items from those levels correctly. For details about the approach to defining and describing the PISA levels and establishing the cut scores, see the OECD's *PISA 2012 Technical Report* (forthcoming). The table below shows the cut scores for each proficiency level for mathematics, science, and reading literacy.

Table A-1. Cut scores for proficiency levels for mathematics, science, and reading literacy: 2012

| Proficiency level | Mathematics | Science | Reading* |
|-------------------|----------------------------|----------------------------|--|
| Below level 1 | 0-357.77 | 0-334.94 | 0-262.04 |
| Level 1 | greater than 357.77-420.07 | greater than 334.94-409.54 | greater than 262.04-334.75 (1b) greater than 334.75-407.47 (1a) |
| Level 2 | greater than 420.07-482.38 | greater than 409.54-484.14 | greater than 407.47-480.18 |
| Level 3 | greater than 482.38-544.68 | greater than 484.14-558.73 | greater than 480.18-552.98 |
| Level 4 | greater than 544.68-606.99 | greater than 558.73-633.33 | greater than 552.98-625.61 |
| Level 5 | greater than 606.99-669.30 | greater than 633.33-707.93 | greater than 625.61-698.32 |
| Level 6 | greater than 669.30-1000 | greater than 707.93-1000 | greater than 698.32-1000 |

*The first reading literacy proficiency level is composed of levels 1a and 1b. The score range for below level 1 refers to scores below level 1b.
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

PISA Indices

Three PISA indices were used in this report. They include the economic, social, and cultural status index, the index of quality of school educational resources, and the index of quality of schools' physical infrastructure.

The PISA economic, social, and cultural status index is a student-level index that was derived from three indices: highest occupational status of parents, highest education level of parents in years of education, and home possessions. The index of home possessions includes all items on indices of family wealth, home educational resources, cultural possessions (such as classical literature, books of poetry, and works of art), as well as the number of books in the home. Higher values on this index indicate a higher economic, social, and cultural status.

The index of quality of schools' educational resources is a school-level index that was derived from items measuring school principals' perceptions of potential resource-related factors hindering instruction at their schools. These factors included a shortage or inadequacy of science laboratory equipment, a shortage or inadequacy of instructional materials, a shortage or inadequacy of computers for instruction, lack or inadequacy of Internet connectivity, a shortage or inadequacy of computer software for instruction, and a shortage or inadequacy of library materials. Higher values on this index indicate a better quality of educational resources.

The index of quality of schools' physical infrastructure is a school-level index that was derived from items looking at school principals' perceptions of potential physical factors hindering instruction at their school. These factors included a shortage or inadequacy of school buildings and grounds, a shortage or inadequacy of heating/cooling and lighting systems, and a shortage or inadequacy of instructional space (e.g., classrooms). Higher values on this index indicate a better quality of physical infrastructure in schools.

For more details on the indices used in this report, see the OECD's *PISA 2012 Technical Report* (forthcoming).

Data Limitations

As with any study, there are limitations to PISA 2012 that should be taken into consideration. Estimates produced using data from PISA 2012 are subject to two types of error: nonsampling errors and sampling errors.

Nonsampling error is a term used to describe variations in the estimates that may be caused by population coverage limitations, nonresponse bias, and measurement error, as well as data collection, processing, and reporting procedures. For example, suppose the study was unsuccessful in getting permission from many rural schools in a certain region of the country. In that case, reports of means for rural schools for that region may be biased. The sources of nonsampling errors are typically problems such as unit and item nonresponse, the differences

in respondents' interpretations of the meaning of survey questions, and mistakes in data preparation.

Sampling errors arise when a sample of the population, rather than the whole population, is used to estimate some statistic. Different samples from the same population would likely produce somewhat different estimates of the statistic in question. This fact means that there is a degree of uncertainty associated with statistics estimated from a sample. This uncertainty is referred to as sampling variance and is usually expressed as the standard error of a statistic estimated from sample data. The approach used for calculating standard errors in PISA was the Fay method of balanced repeated replication (BRR) (Judkins 1990). This method of producing standard errors uses information about the sample design to produce more accurate standard errors than would be produced using simple random sample assumptions.

Standard errors can be used as a measure for the precision expected from a particular sample. Standard errors for all statistics reported in this report are available in appendix C.

Confidence intervals provide a way to make inferences about population statistics in a manner that reflects the sampling error associated with the statistic. Assuming a normal distribution and a 95 percent confidence interval, the population value of this statistic can be inferred to lie within the confidence interval in 95 out of 100 replications of the measurement on different samples drawn from the same population.

Confidentiality and Disclosure Limitations

Confidentiality analyses for Puerto Rico were designed to provide reasonable assurance that data files issued by the PISA consortium would not allow identification of individual Puerto Rico schools or students when compared against other data collections. Disclosure limitations included identifying and masking potential disclosure risk to PISA schools and including an additional measure of uncertainty to school and student identification through random swapping of data elements within the student and

school file. Swapping was designed to not significantly affect estimates of means and variances for the whole sample or reported subgroups (Krenzke et al. 2006).

Statistical Procedures

Comparisons made in the text of this report have been tested for statistical significance. For example, in the commonly made comparison of the Puerto Rico average to the OECD average, Latin America average, or U.S. average, tests of statistical significance were used to establish whether or not the observed differences from the Puerto Rico average were statistically significant.

In almost all instances, the tests for significance used were standard t tests. These fell into two categories according to the nature of the comparison being made: comparisons of independent samples and comparisons of nonindependent samples. In PISA, education system groups are independent. We judge that a difference is "significant" if the probability associated with the t test is less than .05. If a test is significant this implies that difference in the observed means in the sample represents a real difference in the population.⁴ No adjustments were made for multiple comparisons.

In simple comparisons of independent averages, such as the average score of education system 1 with that of education system 2, the following formula was used to compute the t statistic:

$$t = \frac{(est_1 - est_2)}{\sqrt{se_1^2 + se_2^2}},$$

where est_1 and est_2 are the estimates being compared (e.g., averages of education system 1 and education system 2) and se_1^2 and se_2^2 are the corresponding squared standard errors of these averages. The PISA 2012 data are hierarchical and include school and student data from the participating schools. The standard errors for each education system take into account the clustered nature of the sampled data. These

⁴ A .05 probability implies that the t statistic is among the 5 percent most extreme values one would expect if there were no difference between the means. The decision rule is that when t statistics are this extreme, they are sampled from a population where there is a difference between the means.



standard errors are not adjusted for correlations between groups since groups are independent.

The second type of comparison occurs when evaluating differences between nonindependent groups within the education system. Because of the sampling design in which schools and students within schools are randomly sampled, the data within the education system from mutually exclusive sets of students (for example, males and females) are not independent. As a result, to determine whether the performance of females differs from the performance of males, for example, the standard error of the difference taking into account the correlation between females' scores and males' scores needs to be estimated. A BRR procedure, mentioned above, was used to estimate the standard errors

of differences between nonindependent samples within Puerto Rico. Use of the BRR procedure implicitly accounts for the correlation between groups when calculating the standard errors.

To test comparisons between nonindependent groups the following t statistic formula was used:

$$t = \frac{(est_{grp1} - est_{grp2})}{se_{(grp1 - grp2)}},$$

where est_{grp1} and est_{grp2} are the nonindependent group estimates being compared and $se_{(GRP1-GRP2)}$ is the standard error of the difference calculated using BRR to account for the correlation between the estimates for the two nonindependent groups.



Appendix B: International and Puerto Rico Response Rates

This appendix describes the success of participating education systems in meeting the international technical standards on data collection described in appendix A. Information is provided for all participating education systems on their coverage of the target population, exclusion rates, and response rates. This appendix also provides the Puerto Rico response rates.

Response Rates

Table B-1 provides information on weighted school participation rates before and after school replacement and the number of participating schools after replacement for each participating

education system. Table B-2 provides information on overall exclusion rates, weighted student response rates after school replacement, and the number of participating students after replacement for each participating education system.

Fifty-five participating original schools and one replacement school participated in the Puerto Rico administration of PISA, for a total of 56 schools. The weighted school participation rate was 98 percent before replacement and 100 percent after replacement. The overall weighted student response rate was 91 percent and the overall student exclusion rate was less than 1 percent for Puerto Rico. A total of 1,668 students participated in Puerto Rico.

Table B-1. Number of schools and weighted participation rates, by education system: 2012

| Education system | Percent | | Number of participating schools after replacement |
|--|--|---|---|
| | Weighted school participation before replacement | Weighted school participation after replacement | |
| <i>Albania</i> | 100.0 | 100.0 | 204 |
| <i>Argentina</i> | 95.5 | 95.9 | 219 |
| <i>Australia</i> | 97.9 | 97.9 | 757 |
| <i>Austria</i> | 100.0 | 100.0 | 191 |
| <i>Belgium</i> | 84.4 | 96.6 | 282 |
| <i>Brazil</i> | 92.7 | 95.4 | 837 |
| <i>Bulgaria</i> | 99.2 | 99.8 | 187 |
| <i>Canada</i> | 91.3 | 92.9 | 840 |
| <i>Chile</i> | 91.9 | 98.8 | 221 |
| <i>Chinese Taipei</i> | 100.0 | 100.0 | 163 |
| <i>Colombia</i> | 86.6 | 97.4 | 352 |
| <i>Costa Rica</i> | 98.9 | 98.9 | 191 |
| <i>Croatia</i> | 98.7 | 99.9 | 163 |
| <i>Cyprus</i> | 96.6 | 96.6 | 117 |
| <i>Czech Republic</i> | 98.1 | 99.6 | 295 |
| <i>Denmark</i> | 87.0 | 95.5 | 339 |
| <i>Estonia</i> | 100.0 | 100.0 | 206 |
| <i>Finland</i> | 99.0 | 99.3 | 311 |
| <i>France</i> | 96.6 | 96.6 | 223 |
| <i>Germany</i> | 97.7 | 98.0 | 228 |
| <i>Greece</i> | 93.2 | 98.9 | 188 |
| <i>Hong Kong-China</i> | 78.7 | 94.1 | 147 |
| <i>Hungary</i> | 97.6 | 99.4 | 204 |
| <i>Iceland</i> | 99.3 | 99.3 | 133 |
| <i>Indonesia</i> | 94.9 | 98.0 | 206 |
| <i>Ireland</i> | 98.7 | 99.3 | 183 |
| <i>Israel</i> | 91.1 | 93.8 | 172 |
| <i>Italy</i> | 89.1 | 97.4 | 1,186 |
| <i>Japan</i> | 86.3 | 95.5 | 191 |
| <i>Jordan</i> | 100.0 | 100.0 | 233 |
| <i>Kazakhstan</i> | 100.0 | 100.0 | 218 |
| <i>Korea, Republic of</i> | 99.9 | 99.9 | 156 |
| <i>Latvia</i> | 87.9 | 99.9 | 211 |
| <i>Liechtenstein</i> | 100.0 | 100.0 | 12 |
| <i>Lithuania</i> | 98.2 | 100.0 | 216 |
| <i>Luxembourg</i> | 100.0 | 100.0 | 42 |
| <i>Macao-China</i> | 100.0 | 100.0 | 45 |
| <i>Malaysia</i> | 100.0 | 100.0 | 164 |
| <i>Mexico</i> | 91.8 | 95.3 | 1,468 |
| <i>Montenegro, Republic of</i> | 100.0 | 100.0 | 51 |
| <i>Netherlands</i> | 75.3 | 89.4 | 177 |
| <i>New Zealand</i> | 80.9 | 89.3 | 177 |
| <i>Norway</i> | 85.2 | 94.7 | 197 |
| <i>Peru</i> | 97.9 | 98.6 | 240 |
| <i>Poland</i> | 85.4 | 97.9 | 182 |
| <i>Portugal</i> | 95.4 | 95.8 | 187 |
| Puerto Rico | 98.0 | 100.0 | 56 |
| <i>Qatar</i> | 99.9 | 99.9 | 157 |
| <i>Romania</i> | 100.0 | 100.0 | 178 |
| <i>Russian Federation</i> | 100.0 | 100.0 | 227 |
| <i>Serbia, Republic of</i> | 90.0 | 95.4 | 152 |
| <i>Shanghai-China</i> | 100.0 | 100.0 | 155 |
| <i>Singapore</i> | 97.5 | 98.2 | 172 |
| <i>Slovak Republic</i> | 87.5 | 99.0 | 231 |
| <i>Slovenia</i> | 98.1 | 98.1 | 335 |
| <i>Spain</i> | 99.7 | 99.7 | 902 |
| <i>Sweden</i> | 98.9 | 99.8 | 209 |
| <i>Switzerland</i> | 94.5 | 98.3 | 410 |
| <i>Thailand</i> | 98.0 | 100.0 | 239 |
| <i>Tunisia</i> | 99.3 | 99.3 | 152 |
| <i>Turkey</i> | 97.5 | 99.9 | 169 |
| <i>United Arab Emirates</i> | 99.4 | 99.4 | 453 |
| <i>United Kingdom</i> | 80.1 | 89.2 | 505 |
| <i>United States</i> | 67.1 | 77.2 | 161 |
| <i>Uruguay</i> | 99.4 | 100.0 | 180 |
| <i>Vietnam</i> | 100.0 | 100.0 | 162 |
| Education systems under the U.S. PISA national center | | | |
| <i>Connecticut</i> | 98.0 | 98.0 | 50 |
| <i>Florida</i> | 100.0 | 100.0 | 54 |
| <i>Massachusetts</i> | 100.0 | 100.0 | 49 |

NOTE: In calculating school participation rates, each school received a weight equal to the product of its base weight (the reciprocal of its probability of selection) and the number of age-eligible students enrolled in the school, as indicated on the sampling frame. Weighted school participation before replacement refers to the sum of weights of the original sample schools with PISA-assessed students and a student response rate of at least 50 percent over the sum of weights of all original sample schools. Weighted school participation after replacement refers to the sum of weights of the original and replacement schools with PISA-assessed students and a student response rate of at least 50 percent over the sum of weights of responding original sample schools, responding replacement schools, and eligible refusing original sample schools. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public schools only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table B-2. Student exclusion and weighted participation rates, and number of students, by education system: 2012

| Education system | Percent | | Number of participating students |
|--|--------------------------------|--|----------------------------------|
| | Overall student exclusion rate | Weighted student participation after replacement | |
| <i>Albania</i> | 0.1 | 92.5 | 4,743 |
| <i>Argentina</i> | 0.7 | 88.0 | 5,908 |
| <i>Australia</i> | 4.0 | 86.8 | 17,774 |
| <i>Austria</i> | 1.3 | 91.7 | 4,756 |
| <i>Belgium</i> | 1.4 | 90.9 | 9,690 |
| <i>Brazil</i> | 1.4 | 90.1 | 20,091 |
| <i>Bulgaria</i> | 2.6 | 95.7 | 5,282 |
| <i>Canada</i> | 6.4 | 80.8 | 21,548 |
| <i>Chile</i> | 1.3 | 94.6 | 6,857 |
| <i>Chinese Taipei</i> | 1.2 | 96.3 | 6,046 |
| <i>Colombia</i> | 0.1 | 93.1 | 11,173 |
| <i>Costa Rica</i> | 0.0 | 89.0 | 4,602 |
| <i>Croatia</i> | 2.2 | 92.2 | 6,153 |
| <i>Cyprus</i> | 3.3 | 93.3 | 5,078 |
| <i>Czech Republic</i> | 1.8 | 90.1 | 6,535 |
| <i>Denmark</i> | 6.2 | 89.1 | 7,481 |
| <i>Estonia</i> | 5.8 | 92.9 | 5,867 |
| <i>Finland</i> | 1.9 | 90.7 | 8,829 |
| <i>France</i> | 4.4 | 89.5 | 5,682 |
| <i>Germany</i> | 1.5 | 93.2 | 5,001 |
| <i>Greece</i> | 3.6 | 96.7 | 5,125 |
| <i>Hong Kong-China</i> | 1.8 | 93.1 | 4,670 |
| <i>Hungary</i> | 2.6 | 92.7 | 4,810 |
| <i>Iceland</i> | 3.8 | 84.7 | 3,508 |
| <i>Indonesia</i> | 0.3 | 95.2 | 5,622 |
| <i>Ireland</i> | 4.5 | 84.1 | 5,016 |
| <i>Israel</i> | 4.1 | 90.0 | 6,061 |
| <i>Italy</i> | 3.3 | 92.8 | 38,142 |
| <i>Japan</i> | 2.1 | 96.1 | 6,351 |
| <i>Jordan</i> | 0.4 | 95.0 | 7,038 |
| <i>Kazakhstan</i> | 3.4 | 98.9 | 5,808 |
| <i>Korea, Republic of</i> | 0.8 | 98.7 | 5,033 |
| <i>Latvia</i> | 4.0 | 90.9 | 5,276 |
| <i>Liechtenstein</i> | 4.2 | 93.3 | 293 |
| <i>Lithuania</i> | 4.0 | 92.1 | 4,618 |
| <i>Luxembourg</i> | 8.4 | 95.2 | 5,260 |
| <i>Macao-China</i> | 0.2 | 99.4 | 5,335 |
| <i>Malaysia</i> | 0.2 | 94.0 | 5,197 |
| <i>Mexico</i> | 0.7 | 93.9 | 33,806 |
| <i>Montenegro, Republic of</i> | 0.3 | 93.8 | 4,744 |
| <i>Netherlands</i> | 4.4 | 85.0 | 4,460 |
| <i>New Zealand</i> | 4.6 | 84.7 | 5,248 |
| <i>Norway</i> | 6.1 | 90.9 | 4,686 |
| <i>Peru</i> | 0.2 | 96.0 | 6,035 |
| <i>Poland</i> | 4.6 | 87.6 | 5,662 |
| <i>Portugal</i> | 1.6 | 87.4 | 5,722 |
| Puerto Rico | 0.8 | 90.7 | 1,668 |
| <i>Qatar</i> | 2.5 | 99.7 | 10,966 |
| <i>Romania</i> | 3.5 | 97.8 | 5,074 |
| <i>Russian Federation</i> | 2.4 | 97.3 | 6,418 |
| <i>Serbia, Republic of</i> | 2.9 | 93.4 | 4,684 |
| <i>Shanghai-China</i> | 1.5 | 98.5 | 6,374 |
| <i>Singapore</i> | 1.2 | 94.3 | 5,546 |
| <i>Slovak Republic</i> | 2.9 | 93.8 | 5,737 |
| <i>Slovenia</i> | 1.6 | 90.5 | 7,229 |
| <i>Spain</i> | 4.3 | 89.9 | 25,335 |
| <i>Sweden</i> | 5.4 | 92.2 | 4,739 |
| <i>Switzerland</i> | 4.2 | 92.0 | 11,234 |
| <i>Thailand</i> | 1.3 | 98.9 | 6,606 |
| <i>Tunisia</i> | 0.2 | 90.3 | 4,407 |
| <i>Turkey</i> | 1.5 | 98.2 | 4,848 |
| <i>United Arab Emirates</i> | 2.1 | 94.7 | 11,500 |
| <i>United Kingdom</i> | 5.4 | 86.1 | 12,659 |
| <i>United States</i> | 5.4 | 88.9 | 6,111 |
| <i>Uruguay</i> | 0.3 | 90.0 | 5,315 |
| <i>Vietnam</i> | 0.7 | 99.9 | 4,959 |
| Education systems under the U.S. PISA national center | | | |
| <i>Connecticut</i> | 4.1 | 87.5 | 1,697 |
| <i>Florida</i> | 8.3 | 90.0 | 1,896 |
| <i>Massachusetts</i> | 4.4 | 90.0 | 1,723 |

NOTE: In calculating student participation rates, each student received a weight (student base weight) equal to the product of the school base weight—for the school in which the student was enrolled—and the reciprocal of the student selection probability within the school. Overall student exclusion rate is the percentage of students excluded for intellectual or functional disabilities, or insufficient assessment language experience at either the school level or within schools. Weighted student participation after replacement refers to the sum of weights of students in original and replacement schools with PISA-assessed students and a student response rate of at least 50 percent over the sum of weights of students in responding original sample schools, responding replacement schools, and eligible refusing original sample schools. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Appendix C: Standard Error Tables

Table C-1. Standard errors for table 1: Average scores of 15-year-old students on PISA mathematics literacy scale, by education system: 2012

| Education system | Average score | s.e. | Education system | Average score | s.e. |
|---------------------------|---------------|------|--|---------------|------------|
| OECD average | 494 | 0.5 | | | |
| Latin America average | 397 | 1.2 | | | |
| <i>Shanghai-China</i> | 613 | 3.3 | <i>Lithuania</i> | 479 | 2.6 |
| <i>Singapore</i> | 573 | 1.3 | Sweden | 478 | 2.3 |
| <i>Hong Kong-China</i> | 561 | 3.2 | Hungary | 477 | 3.2 |
| <i>Chinese Taipei</i> | 560 | 3.3 | <i>Croatia</i> | 471 | 3.5 |
| Korea, Republic of | 554 | 4.6 | Israel | 466 | 4.7 |
| <i>Macao-China</i> | 538 | 1.0 | Greece | 453 | 2.5 |
| Japan | 536 | 3.6 | <i>Serbia, Republic of</i> | 449 | 3.4 |
| <i>Liechtenstein</i> | 535 | 4.0 | Turkey | 448 | 4.8 |
| Switzerland | 531 | 3.0 | <i>Romania</i> | 445 | 3.8 |
| Netherlands | 523 | 3.5 | <i>Cyprus</i> | 440 | 1.1 |
| Estonia | 521 | 2.0 | <i>Bulgaria</i> | 439 | 4.0 |
| Finland | 519 | 1.9 | <i>United Arab Emirates</i> | 434 | 2.4 |
| Canada | 518 | 1.8 | <i>Kazakhstan</i> | 432 | 3.0 |
| Poland | 518 | 3.6 | <i>Thailand</i> | 427 | 3.4 |
| Belgium | 515 | 2.1 | Chile | 423 | 3.1 |
| Germany | 514 | 2.9 | <i>Malaysia</i> | 421 | 3.2 |
| <i>Vietnam</i> | 511 | 4.8 | Mexico | 413 | 1.4 |
| Austria | 506 | 2.7 | <i>Montenegro, Republic of</i> | 410 | 1.1 |
| Australia | 504 | 1.6 | <i>Uruguay</i> | 409 | 2.8 |
| Ireland | 501 | 2.2 | <i>Costa Rica</i> | 407 | 3.0 |
| Slovenia | 501 | 1.2 | <i>Albania</i> | 394 | 2.0 |
| Denmark | 500 | 2.3 | <i>Brazil</i> | 391 | 2.1 |
| New Zealand | 500 | 2.2 | <i>Argentina</i> | 388 | 3.5 |
| Czech Republic | 499 | 2.9 | <i>Tunisia</i> | 388 | 3.9 |
| France | 495 | 2.5 | <i>Jordan</i> | 386 | 3.1 |
| United Kingdom | 494 | 3.3 | Puerto Rico | 382 | 3.6 |
| Iceland | 493 | 1.7 | <i>Colombia</i> | 376 | 2.9 |
| <i>Latvia</i> | 491 | 2.8 | <i>Qatar</i> | 376 | 0.8 |
| Luxembourg | 490 | 1.1 | <i>Indonesia</i> | 375 | 4.0 |
| Norway | 489 | 2.7 | <i>Peru</i> | 368 | 3.7 |
| Portugal | 487 | 3.8 | | | |
| Italy | 485 | 2.0 | Education systems under the U.S. PISA national center | | |
| Spain | 484 | 1.9 | <i>Massachusetts</i> | 514 | 6.2 |
| <i>Russian Federation</i> | 482 | 3.0 | <i>Connecticut</i> | 506 | 6.2 |
| Slovak Republic | 482 | 3.4 | <i>Florida</i> | 467 | 5.8 |
| United States | 481 | 3.6 | | | |

NOTE: Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Scores are reported on a scale from 0 to 1,000. Standard error is noted by s.e. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only. SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-2. Standard errors for table 2: Average scores of 15-year-old students on PISA mathematics literacy content subscales, by education system: 2012

| Quantity | | | Uncertainty and data | | |
|--|---------------|------------|--|---------------|------------|
| Education system | Average score | s.e. | Education system | Average score | s.e. |
| OECD average | 495 | 0.5 | OECD average | 493 | 0.5 |
| Latin America average | 397 | 1.3 | Latin America average | 402 | 1.1 |
| <i>Shanghai-China</i> | 591 | 3.2 | <i>Shanghai-China</i> | 592 | 3.0 |
| <i>Singapore</i> | 569 | 1.2 | <i>Singapore</i> | 559 | 1.5 |
| <i>Hong Kong-China</i> | 566 | 3.4 | <i>Hong Kong-China</i> | 553 | 3.0 |
| <i>Chinese Taipei</i> | 543 | 3.1 | <i>Chinese Taipei</i> | 549 | 3.2 |
| <i>Liechtenstein</i> | 538 | 4.1 | <i>Liechtenstein</i> | 538 | 4.2 |
| Korea, Republic of | 537 | 4.1 | Korea, Republic of | 532 | 3.8 |
| Netherlands | 532 | 3.6 | Netherlands | 528 | 3.5 |
| Switzerland | 531 | 3.1 | Japan | 526 | 3.9 |
| <i>Macao-China</i> | 531 | 1.1 | <i>Macao-China</i> | 525 | 1.1 |
| Finland | 527 | 1.9 | Switzerland | 522 | 3.2 |
| Estonia | 525 | 2.2 | <i>Vietnam</i> | 519 | 4.5 |
| Belgium | 519 | 2.0 | Finland | 519 | 2.4 |
| Poland | 519 | 3.5 | Poland | 517 | 3.5 |
| Japan | 518 | 3.6 | Canada | 516 | 1.8 |
| Germany | 517 | 3.1 | Estonia | 510 | 2.0 |
| Canada | 515 | 2.2 | Germany | 509 | 3.0 |
| Austria | 510 | 2.9 | Ireland | 509 | 2.5 |
| <i>Vietnam</i> | 509 | 5.5 | Belgium | 508 | 2.5 |
| Ireland | 505 | 2.6 | Australia | 508 | 1.5 |
| Czech Republic | 505 | 3.0 | New Zealand | 506 | 2.6 |
| Slovenia | 504 | 1.2 | Denmark | 505 | 2.4 |
| Denmark | 502 | 2.4 | United Kingdom | 502 | 3.0 |
| Australia | 500 | 1.9 | Austria | 499 | 2.7 |
| New Zealand | 499 | 2.4 | Norway | 497 | 3.0 |
| Iceland | 496 | 1.9 | Slovenia | 496 | 1.2 |
| France | 496 | 2.6 | Iceland | 496 | 1.8 |
| Luxembourg | 495 | 1.0 | France | 492 | 2.7 |
| United Kingdom | 494 | 3.8 | United States | 488 | 3.5 |
| Norway | 492 | 2.9 | Czech Republic | 488 | 2.8 |
| Spain | 491 | 2.3 | Spain | 487 | 2.3 |
| Italy | 491 | 2.0 | Portugal | 486 | 3.8 |
| <i>Latvia</i> | 487 | 2.9 | Luxembourg | 483 | 1.0 |
| Slovak Republic | 486 | 3.5 | Sweden | 483 | 2.5 |
| <i>Lithuania</i> | 483 | 2.8 | Italy | 482 | 2.0 |
| Sweden | 482 | 2.5 | <i>Latvia</i> | 478 | 2.8 |
| Portugal | 481 | 4.0 | Hungary | 476 | 3.3 |
| <i>Croatia</i> | 480 | 3.7 | <i>Lithuania</i> | 474 | 2.7 |
| Israel | 480 | 5.2 | Slovak Republic | 472 | 3.6 |
| United States | 478 | 3.9 | <i>Croatia</i> | 468 | 3.5 |
| <i>Russian Federation</i> | 478 | 3.0 | Israel | 465 | 4.7 |
| Hungary | 476 | 3.4 | <i>Russian Federation</i> | 463 | 3.3 |
| <i>Serbia, Republic of</i> | 456 | 3.7 | Greece | 460 | 2.6 |
| Greece | 455 | 3.0 | <i>Serbia, Republic of</i> | 448 | 3.3 |
| <i>Romania</i> | 443 | 4.5 | Turkey | 447 | 4.6 |
| <i>Bulgaria</i> | 443 | 4.3 | Cyprus | 442 | 1.1 |
| Turkey | 442 | 5.0 | <i>Romania</i> | 437 | 3.3 |
| Cyprus | 439 | 1.1 | <i>Thailand</i> | 433 | 3.1 |
| <i>United Arab Emirates</i> | 431 | 2.7 | <i>United Arab Emirates</i> | 432 | 2.4 |
| <i>Kazakhstan</i> | 428 | 3.5 | <i>Bulgaria</i> | 432 | 3.9 |
| Chile | 421 | 3.3 | Chile | 430 | 2.9 |
| <i>Thailand</i> | 419 | 3.7 | <i>Malaysia</i> | 422 | 3.0 |
| Mexico | 414 | 1.5 | <i>Montenegro, Republic of</i> | 415 | 1.0 |
| Uruguay | 411 | 3.2 | <i>Costa Rica</i> | 414 | 2.9 |
| <i>Malaysia</i> | 409 | 3.6 | <i>Kazakhstan</i> | 414 | 2.6 |
| <i>Montenegro, Republic of</i> | 409 | 1.2 | Mexico | 413 | 1.2 |
| <i>Costa Rica</i> | 406 | 3.6 | Uruguay | 407 | 2.7 |
| <i>Brazil</i> | 393 | 2.5 | <i>Brazil</i> | 402 | 2.0 |
| <i>Argentina</i> | 391 | 3.7 | <i>Tunisia</i> | 399 | 3.6 |
| <i>Albania</i> | 386 | 2.7 | <i>Jordan</i> | 394 | 3.2 |
| Puerto Rico | 379 | 4.3 | Puerto Rico | 392 | 3.5 |
| <i>Tunisia</i> | 378 | 4.6 | <i>Argentina</i> | 389 | 3.5 |
| <i>Colombia</i> | 375 | 3.4 | <i>Colombia</i> | 388 | 2.4 |
| <i>Qatar</i> | 371 | 0.9 | <i>Albania</i> | 386 | 2.4 |
| <i>Jordan</i> | 367 | 3.4 | <i>Indonesia</i> | 384 | 3.9 |
| <i>Peru</i> | 365 | 4.1 | <i>Qatar</i> | 382 | 0.8 |
| <i>Indonesia</i> | 362 | 4.7 | <i>Peru</i> | 373 | 3.3 |
| Education systems under the U.S. PISA national center | | | Education systems under the U.S. PISA national center | | |
| <i>Massachusetts</i> | 506 | 6.0 | <i>Massachusetts</i> | 523 | 6.4 |
| <i>Connecticut</i> | 502 | 6.5 | <i>Connecticut</i> | 512 | 5.8 |
| <i>Florida</i> | 458 | 6.4 | <i>Florida</i> | 475 | 5.9 |

See notes at end of table.

Table C-2. Standard errors for table 2: Average scores of 15-year-old students on PISA mathematics literacy content subscales, by education system: 2012 (continued)

| Change and relationship | | | Space and shape | | |
|--|---------------|------------|--|---------------|------------|
| Education system | Average score | s.e. | Education system | Average score | s.e. |
| OECD average | 493 | 0.6 | OECD average | 490 | 0.5 |
| Latin America average | 384 | 1.4 | Latin America average | 393 | 1.3 |
| <i>Shanghai-China</i> | 624 | 3.6 | <i>Shanghai-China</i> | 649 | 3.6 |
| <i>Singapore</i> | 580 | 1.5 | <i>Chinese Taipei</i> | 592 | 3.8 |
| <i>Hong Kong-China</i> | 564 | 3.6 | <i>Singapore</i> | 580 | 1.5 |
| <i>Chinese Taipei</i> | 561 | 3.5 | Korea, Republic of | 573 | 5.2 |
| Korea, Republic of | 559 | 5.2 | <i>Hong Kong-China</i> | 567 | 4.0 |
| <i>Macao-China</i> | 542 | 1.2 | <i>Macao-China</i> | 558 | 1.4 |
| Japan | 542 | 4.0 | Japan | 558 | 3.7 |
| <i>Liechtenstein</i> | 542 | 4.0 | Switzerland | 544 | 3.1 |
| Estonia | 530 | 2.3 | <i>Liechtenstein</i> | 539 | 4.5 |
| Switzerland | 530 | 3.4 | Poland | 524 | 4.2 |
| Canada | 525 | 2.0 | Estonia | 513 | 2.5 |
| Finland | 520 | 2.6 | Canada | 510 | 2.1 |
| Netherlands | 518 | 3.9 | Belgium | 509 | 2.4 |
| Germany | 516 | 3.8 | Netherlands | 507 | 3.5 |
| Belgium | 513 | 2.6 | Germany | 507 | 3.2 |
| <i>Vietnam</i> | 509 | 5.1 | <i>Vietnam</i> | 507 | 5.1 |
| Poland | 509 | 4.1 | Finland | 507 | 2.1 |
| Australia | 509 | 1.7 | Slovenia | 503 | 1.4 |
| Austria | 506 | 3.4 | Austria | 501 | 3.1 |
| Ireland | 501 | 2.6 | Czech Republic | 499 | 3.4 |
| New Zealand | 501 | 2.5 | <i>Latvia</i> | 497 | 3.3 |
| Czech Republic | 499 | 3.5 | Denmark | 497 | 2.5 |
| Slovenia | 499 | 1.1 | Australia | 497 | 1.8 |
| France | 497 | 2.7 | <i>Russian Federation</i> | 496 | 3.9 |
| <i>Latvia</i> | 496 | 3.4 | Portugal | 491 | 4.2 |
| United Kingdom | 496 | 3.4 | New Zealand | 491 | 2.4 |
| Denmark | 494 | 2.7 | Slovak Republic | 490 | 4.1 |
| <i>Russian Federation</i> | 491 | 3.4 | France | 489 | 2.7 |
| United States | 488 | 3.5 | Iceland | 489 | 1.5 |
| Luxembourg | 488 | 1.0 | Italy | 487 | 2.5 |
| Iceland | 487 | 1.9 | Luxembourg | 486 | 1.0 |
| Portugal | 486 | 4.1 | Norway | 480 | 3.3 |
| Spain | 482 | 2.0 | Ireland | 478 | 2.6 |
| Hungary | 481 | 3.5 | Spain | 477 | 2.0 |
| <i>Lithuania</i> | 479 | 3.2 | United Kingdom | 475 | 3.5 |
| Norway | 478 | 3.1 | Hungary | 474 | 3.4 |
| Italy | 477 | 2.1 | <i>Lithuania</i> | 472 | 3.1 |
| Slovak Republic | 474 | 4.0 | Sweden | 469 | 2.5 |
| Sweden | 469 | 2.8 | United States | 463 | 4.0 |
| <i>Croatia</i> | 468 | 4.2 | <i>Croatia</i> | 460 | 3.9 |
| Israel | 462 | 5.3 | <i>Kazakhstan</i> | 450 | 3.9 |
| Turkey | 448 | 5.0 | Israel | 449 | 4.8 |
| Greece | 446 | 3.2 | <i>Romania</i> | 447 | 4.1 |
| <i>Romania</i> | 446 | 3.9 | <i>Serbia, Republic of</i> | 446 | 3.9 |
| <i>United Arab Emirates</i> | 442 | 2.6 | Turkey | 443 | 5.5 |
| <i>Serbia, Republic of</i> | 442 | 4.1 | <i>Bulgaria</i> | 442 | 4.3 |
| Cyprus | 440 | 1.2 | Greece | 436 | 2.6 |
| <i>Bulgaria</i> | 434 | 4.5 | Cyprus | 436 | 1.1 |
| <i>Kazakhstan</i> | 433 | 3.2 | <i>Malaysia</i> | 434 | 3.4 |
| <i>Thailand</i> | 414 | 3.9 | <i>Thailand</i> | 432 | 4.1 |
| Chile | 411 | 3.5 | <i>United Arab Emirates</i> | 425 | 2.4 |
| Mexico | 405 | 1.6 | Chile | 419 | 3.2 |
| <i>Costa Rica</i> | 402 | 3.5 | <i>Albania</i> | 418 | 2.6 |
| Uruguay | 401 | 3.2 | Uruguay | 413 | 3.1 |
| Malaysia | 401 | 4.0 | Mexico | 413 | 1.6 |
| <i>Montenegro, Republic of</i> | 399 | 1.3 | <i>Montenegro, Republic of</i> | 412 | 1.1 |
| <i>Albania</i> | 388 | 2.1 | <i>Costa Rica</i> | 397 | 3.2 |
| <i>Jordan</i> | 387 | 3.7 | <i>Jordan</i> | 385 | 3.1 |
| <i>Tunisia</i> | 379 | 4.5 | <i>Argentina</i> | 385 | 3.5 |
| <i>Argentina</i> | 379 | 4.2 | <i>Indonesia</i> | 383 | 4.2 |
| Brazil | 372 | 2.7 | <i>Tunisia</i> | 382 | 3.9 |
| <i>Indonesia</i> | 364 | 4.3 | Brazil | 381 | 2.0 |
| Puerto Rico | 364 | 5.0 | <i>Qatar</i> | 380 | 1.0 |
| <i>Qatar</i> | 363 | 0.9 | Puerto Rico | 378 | 3.3 |
| <i>Colombia</i> | 357 | 3.7 | Peru | 370 | 4.1 |
| <i>Peru</i> | 349 | 4.5 | <i>Colombia</i> | 369 | 3.5 |
| Education systems under the U.S. PISA national center | | | Education systems under the U.S. PISA national center | | |
| <i>Massachusetts</i> | 518 | 6.7 | <i>Massachusetts</i> | 498 | 7.2 |
| <i>Connecticut</i> | 515 | 7.0 | <i>Connecticut</i> | 487 | 7.0 |
| <i>Florida</i> | 476 | 5.6 | <i>Florida</i> | 446 | 6.4 |

NOTE: Education systems are ordered by 2012 average subscale score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Scores are reported on a scale from 0 to 1,000. Standard error is noted by s.e. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-3. Standard errors for table 3: Percentage distribution of 15-year-old students on PISA mathematics literacy scale, by proficiency level and education system: 2012

| Education system | Below level 1 | | Level 1 | | Level 2 | | Level 3 | | Level 4 | | Level 5 | | Level 6 | |
|--|---------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|---------|------|---------|------|---------|------|
| | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. |
| OECD average | 8.0 | 0.12 | 15.0 | 0.13 | 22.5 | 0.15 | 23.7 | 0.15 | 18.1 | 0.14 | 9.3 | 0.11 | 3.3 | 0.08 |
| Latin America average | 32.0 | 0.55 | 30.9 | 0.32 | 22.5 | 0.37 | 10.5 | 0.29 | 3.3 | 0.17 | 0.7 | 0.07 | 0.1 | 0.02 |
| <i>Albania</i> | 32.5 | 1.03 | 28.1 | 0.97 | 22.9 | 0.91 | 12.0 | 0.92 | 3.6 | 0.35 | 0.8 | 0.20 | ‡ | † |
| <i>Argentina</i> | 34.9 | 1.95 | 31.6 | 1.22 | 22.2 | 1.36 | 9.2 | 0.88 | 1.8 | 0.35 | 0.3! | 0.10 | ‡ | † |
| Australia | 6.1 | 0.35 | 13.5 | 0.57 | 21.9 | 0.76 | 24.6 | 0.65 | 19.0 | 0.50 | 10.5 | 0.43 | 4.3 | 0.36 |
| Austria | 5.7 | 0.59 | 13.0 | 0.74 | 21.9 | 0.87 | 24.2 | 0.84 | 21.0 | 0.90 | 11.0 | 0.75 | 3.3 | 0.41 |
| Belgium | 7.0 | 0.58 | 12.0 | 0.52 | 18.4 | 0.58 | 22.4 | 0.70 | 20.6 | 0.63 | 13.4 | 0.73 | 6.1 | 0.43 |
| <i>Brazil</i> | 35.2 | 0.93 | 31.9 | 0.70 | 20.4 | 0.67 | 8.9 | 0.47 | 2.9 | 0.35 | 0.7 | 0.19 | ‡ | † |
| <i>Bulgaria</i> | 20.0 | 1.45 | 23.8 | 0.95 | 24.4 | 1.12 | 17.9 | 0.91 | 9.9 | 0.83 | 3.4 | 0.50 | 0.7 | 0.19 |
| Canada | 3.6 | 0.28 | 10.2 | 0.45 | 21.0 | 0.64 | 26.4 | 0.62 | 22.4 | 0.49 | 12.1 | 0.47 | 4.3 | 0.29 |
| Chile | 22.0 | 1.35 | 29.5 | 1.01 | 25.3 | 1.00 | 15.4 | 0.78 | 6.2 | 0.60 | 1.5 | 0.21 | 0.1! | 0.04 |
| <i>Chinese Taipei</i> | 4.5 | 0.53 | 8.3 | 0.61 | 13.1 | 0.61 | 17.1 | 0.65 | 19.7 | 0.75 | 19.2 | 0.89 | 18.0 | 1.00 |
| <i>Colombia</i> | 41.6 | 1.71 | 32.2 | 1.05 | 17.8 | 0.90 | 6.4 | 0.61 | 1.6 | 0.28 | 0.3! | 0.10 | ‡ | † |
| <i>Costa Rica</i> | 23.6 | 1.68 | 36.2 | 1.22 | 26.8 | 1.29 | 10.1 | 0.99 | 2.6 | 0.46 | 0.5! | 0.16 | ‡ | † |
| <i>Croatia</i> | 9.5 | 0.74 | 20.4 | 1.02 | 26.7 | 0.95 | 22.9 | 1.12 | 13.5 | 0.80 | 5.4 | 0.76 | 1.6! | 0.51 |
| <i>Cyprus</i> | 19.0 | 0.58 | 23.0 | 0.65 | 25.5 | 0.62 | 19.2 | 0.58 | 9.6 | 0.44 | 3.1 | 0.25 | 0.6! | 0.20 |
| Czech Republic | 6.8 | 0.76 | 14.2 | 0.97 | 21.7 | 0.83 | 24.8 | 1.07 | 19.7 | 0.90 | 9.6 | 0.66 | 3.2 | 0.31 |
| Denmark | 4.4 | 0.49 | 12.5 | 0.70 | 24.4 | 0.97 | 29.0 | 1.03 | 19.8 | 0.69 | 8.3 | 0.57 | 1.7 | 0.32 |
| Estonia | 2.0 | 0.26 | 8.6 | 0.57 | 22.0 | 0.84 | 29.4 | 0.79 | 23.4 | 0.91 | 11.0 | 0.67 | 3.6 | 0.37 |
| Finland | 3.3 | 0.39 | 8.9 | 0.49 | 20.5 | 0.66 | 28.8 | 0.78 | 23.2 | 0.78 | 11.7 | 0.60 | 3.5 | 0.30 |
| France | 8.7 | 0.72 | 13.6 | 0.76 | 22.1 | 0.95 | 23.8 | 0.82 | 18.9 | 0.79 | 9.8 | 0.55 | 3.1 | 0.40 |
| Germany | 5.5 | 0.65 | 12.2 | 0.81 | 19.4 | 0.81 | 23.7 | 0.79 | 21.7 | 0.73 | 12.8 | 0.71 | 4.7 | 0.49 |
| Greece | 14.5 | 0.92 | 21.2 | 0.85 | 27.2 | 1.02 | 22.1 | 0.86 | 11.2 | 0.79 | 3.3 | 0.43 | 0.6 | 0.15 |
| <i>Hong Kong-China</i> | 2.6 | 0.36 | 5.9 | 0.61 | 12.0 | 0.77 | 19.7 | 0.97 | 26.1 | 1.09 | 21.4 | 0.96 | 12.3 | 0.95 |
| Hungary | 9.9 | 0.77 | 18.2 | 1.04 | 25.3 | 1.21 | 23.0 | 1.02 | 14.4 | 0.86 | 7.1 | 0.73 | 2.1 | 0.51 |
| Iceland | 7.5 | 0.54 | 14.0 | 0.83 | 23.6 | 0.89 | 25.7 | 0.95 | 18.1 | 0.79 | 8.9 | 0.61 | 2.3 | 0.35 |
| <i>Indonesia</i> | 42.3 | 2.14 | 33.4 | 1.59 | 16.8 | 1.12 | 5.7 | 0.90 | 1.5! | 0.54 | ‡ | † | ‡ | † |
| Ireland | 4.8 | 0.55 | 12.1 | 0.70 | 23.9 | 0.72 | 28.2 | 0.87 | 20.3 | 0.76 | 8.5 | 0.51 | 2.2 | 0.23 |
| Israel | 15.9 | 1.23 | 17.6 | 0.93 | 21.6 | 0.93 | 21.0 | 0.87 | 14.6 | 0.88 | 7.2 | 0.74 | 2.2 | 0.39 |
| Italy | 8.5 | 0.39 | 16.1 | 0.51 | 24.1 | 0.55 | 24.6 | 0.62 | 16.7 | 0.48 | 7.8 | 0.44 | 2.2 | 0.25 |
| Japan | 3.2 | 0.49 | 7.9 | 0.69 | 16.9 | 0.85 | 24.7 | 1.00 | 23.7 | 0.89 | 16.0 | 0.89 | 7.6 | 0.84 |
| <i>Jordan</i> | 36.5 | 1.59 | 32.1 | 0.95 | 21.0 | 1.04 | 8.1 | 0.63 | 1.8 | 0.33 | ‡ | † | ‡ | † |
| <i>Kazakhstan</i> | 14.5 | 0.90 | 30.7 | 1.40 | 31.5 | 0.95 | 16.9 | 1.11 | 5.4 | 0.79 | 0.9! | 0.27 | ‡ | † |
| Korea, Republic of | 2.7 | 0.46 | 6.4 | 0.62 | 14.7 | 0.85 | 21.4 | 0.99 | 23.9 | 1.23 | 18.8 | 0.92 | 12.1 | 1.26 |
| <i>Latvia</i> | 4.8 | 0.53 | 15.1 | 0.96 | 26.6 | 1.29 | 27.8 | 0.92 | 17.6 | 0.90 | 6.5 | 0.65 | 1.5 | 0.28 |
| <i>Liechtenstein</i> | 3.5! | 1.31 | 10.6 | 1.81 | 15.2 | 2.52 | 22.7 | 2.81 | 23.2 | 3.01 | 17.4 | 3.17 | 7.4 | 1.86 |
| <i>Lithuania</i> | 8.7 | 0.68 | 17.3 | 0.89 | 25.9 | 0.80 | 24.6 | 1.01 | 15.4 | 0.70 | 6.6 | 0.49 | 1.4 | 0.24 |
| Luxembourg | 8.8 | 0.54 | 15.5 | 0.54 | 22.3 | 0.72 | 23.6 | 0.72 | 18.5 | 0.58 | 8.6 | 0.38 | 2.6 | 0.25 |
| <i>Macao-China</i> | 3.2 | 0.29 | 7.6 | 0.53 | 16.4 | 0.71 | 24.0 | 0.69 | 24.4 | 0.87 | 16.8 | 0.63 | 7.6 | 0.35 |
| <i>Malaysia</i> | 23.0 | 1.19 | 28.8 | 1.12 | 26.0 | 0.95 | 14.9 | 0.93 | 6.0 | 0.69 | 1.2 | 0.28 | 0.1! | 0.05 |
| Mexico | 22.8 | 0.68 | 31.9 | 0.58 | 27.8 | 0.53 | 13.1 | 0.41 | 3.7 | 0.23 | 0.6 | 0.07 | ‡ | † |
| <i>Montenegro, Republic of</i> | 27.5 | 0.64 | 29.1 | 1.14 | 24.2 | 1.06 | 13.1 | 0.73 | 4.9 | 0.48 | 0.9 | 0.20 | ‡ | † |
| Netherlands | 3.8 | 0.57 | 11.0 | 0.93 | 17.9 | 1.08 | 24.2 | 1.19 | 23.8 | 1.11 | 14.9 | 0.99 | 4.4 | 0.56 |
| New Zealand | 7.5 | 0.58 | 15.1 | 0.66 | 21.6 | 0.83 | 22.7 | 0.76 | 18.1 | 0.84 | 10.5 | 0.75 | 4.5 | 0.40 |
| Norway | 7.2 | 0.78 | 15.1 | 0.88 | 24.3 | 0.84 | 25.7 | 1.01 | 18.3 | 0.96 | 7.3 | 0.56 | 2.1 | 0.30 |
| <i>Peru</i> | 47.0 | 1.79 | 27.6 | 0.88 | 16.1 | 1.00 | 6.7 | 0.68 | 2.1 | 0.38 | 0.5! | 0.20 | ‡ | † |
| Poland | 3.3 | 0.38 | 11.1 | 0.77 | 22.1 | 0.93 | 25.5 | 0.94 | 21.3 | 1.12 | 11.7 | 0.78 | 5.0 | 0.80 |
| Portugal | 8.9 | 0.79 | 16.0 | 0.98 | 22.8 | 0.88 | 24.0 | 0.84 | 17.7 | 0.88 | 8.5 | 0.73 | 2.1 | 0.33 |
| Puerto Rico | 34.2 | 2.36 | 39.8 | 2.25 | 20.6 | 1.86 | 4.6 | 1.01 | ‡ | † | ‡ | † | ‡ | † |
| <i>Qatar</i> | 47.0 | 0.42 | 22.6 | 0.53 | 15.2 | 0.39 | 8.8 | 0.34 | 4.5 | 0.28 | 1.7 | 0.20 | 0.3 | 0.07 |
| <i>Romania</i> | 14.0 | 1.15 | 26.8 | 1.23 | 28.3 | 1.09 | 19.2 | 1.07 | 8.4 | 0.81 | 2.6 | 0.45 | 0.6! | 0.27 |
| <i>Russian Federation</i> | 7.5 | 0.70 | 16.5 | 0.80 | 26.6 | 0.99 | 26.0 | 0.97 | 15.7 | 0.78 | 6.3 | 0.64 | 1.5 | 0.31 |
| <i>Serbia, Republic of</i> | 15.5 | 1.16 | 23.4 | 0.93 | 26.5 | 1.12 | 19.5 | 1.03 | 10.5 | 0.69 | 3.5 | 0.52 | 1.1 | 0.31 |
| <i>Shanghai-China</i> | 0.8 | 0.21 | 2.9 | 0.46 | 7.5 | 0.64 | 13.1 | 0.77 | 20.2 | 0.83 | 24.6 | 1.04 | 30.8 | 1.24 |
| <i>Singapore</i> | 2.2 | 0.23 | 6.1 | 0.40 | 12.2 | 0.68 | 17.5 | 0.66 | 22.0 | 0.62 | 21.0 | 0.58 | 19.0 | 0.51 |
| Slovak Republic | 11.1 | 1.03 | 16.4 | 0.94 | 23.1 | 1.10 | 22.1 | 1.09 | 16.4 | 1.08 | 7.8 | 0.64 | 3.1 | 0.55 |
| Slovenia | 5.1 | 0.48 | 15.0 | 0.69 | 23.6 | 0.95 | 23.9 | 0.96 | 18.7 | 0.80 | 10.3 | 0.64 | 3.4 | 0.43 |
| Spain | 7.8 | 0.50 | 15.8 | 0.57 | 24.9 | 0.65 | 26.0 | 0.59 | 17.6 | 0.56 | 6.7 | 0.42 | 1.3 | 0.15 |
| Sweden | 9.5 | 0.68 | 17.5 | 0.76 | 24.7 | 0.92 | 23.9 | 0.78 | 16.3 | 0.69 | 6.5 | 0.49 | 1.6 | 0.25 |
| Switzerland | 3.6 | 0.35 | 8.9 | 0.59 | 17.8 | 1.06 | 24.5 | 1.02 | 23.9 | 0.80 | 14.6 | 0.78 | 6.8 | 0.69 |
| <i>Thailand</i> | 19.1 | 1.07 | 30.6 | 1.20 | 27.3 | 1.00 | 14.5 | 1.15 | 5.8 | 0.74 | 2.0 | 0.38 | 0.5! | 0.19 |
| <i>Tunisia</i> | 36.5 | 1.88 | 31.3 | 1.09 | 21.1 | 1.17 | 8.0 | 0.79 | 2.3 | 0.68 | 0.7! | 0.32 | ‡ | † |
| Turkey | 15.5 | 1.08 | 26.5 | 1.28 | 25.5 | 1.16 | 16.5 | 1.05 | 10.1 | 1.09 | 4.7 | 0.81 | 1.2! | 0.46 |
| <i>United Arab Emirates</i> | 20.5 | 0.92 | 25.8 | 0.81 | 24.9 | 0.69 | 16.9 | 0.64 | 8.5 | 0.54 | 2.9 | 0.25 | 0.5 | 0.11 |
| United Kingdom | 7.8 | 0.77 | 14.0 | 0.76 | 23.2 | 0.81 | 24.8 | 0.85 | 18.4 | 0.78 | 9.0 | 0.63 | 2.9 | 0.42 |
| United States | 8.0 | 0.73 | 17.9 | 0.98 | 26.3 | 0.84 | 23.3 | 0.93 | 15.8 | 0.91 | 6.6 | 0.61 | 2.2 | 0.34 |
| <i>Uruguay</i> | 29.2 | 1.20 | 26.5 | 0.76 | 23.0 | 0.93 | 14.4 | 0.87 | 5.4 | 0.60 | 1.3 | 0.28 | ‡ | 0.08 |
| <i>Vietnam</i> | 3.6 | 0.80 | 10.6 | 1.26 | 22.8 | 1.28 | 28.4 | 1.52 | 21.3 | 1.22 | 9.8 | 0.99 | 3.5 | 0.75 |
| Education systems under the U.S. PISA national center | | | | | | | | | | | | | | |
| <i>Connecticut</i> | 6.8 | 1.18 | 13.8 | 1.33 | 20.0 | 1.28 | 24.3 | 1.36 | 18.6 | 1.79 | 11.5 | 1.46 | 4.9 | 0.83 |
| <i>Florida</i> | 9.7 | 1.44 | 20.6 | 1.87 | 27.9 | 1.42 | 23.0 | 1.64 | 13.0 | 1.34 | 4.9 | 1.04 | 0.9! | 0.39 |
| <i>Massachusetts</i> | 5.3 | 0.83 | 12.5 | 1.17 | 20.4 | 1.61 | 24.3 | 1.49 | 18.9 | 1.18 | 12.7 | 1.61 | 5.8 | 1.11 |

† Not applicable.

! Interpret data with caution. Estimate is unstable due to high coefficient of variation.

‡ Reporting standards not met.

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into mathematics literacy levels according to their scores. Exact cut scores are as follows: below level 1 (a score less than or equal to 357.77); level 1 (a score greater than 357.77 and less than or equal to 420.07); level 2 (a score greater than 420.07 and less than or equal to 482.38); level 3 (a score greater than 482.38 and less than or equal to 544.68); level 4 (a score greater than 544.68 and less than or equal to 606.99); level 5 (a score greater than 606.99 and less than or equal to 669.30); and level 6 (a score greater than 669.30). Scores are reported on a scale from 0 to 1,000. The OECD average is the average of the national percentages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national percentages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Detail may not sum to totals because of rounding. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-4. Standard errors for table 4: Percentage distribution of 15-year-old students on PISA mathematics literacy content subscales, by proficiency level and education system: 2012

| Education system | Quantity | | | | | | | | | | | | | |
|--|---------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|----------|----------|----------|----------|
| | Below level 1 | | Level 1 | | Level 2 | | Level 3 | | Level 4 | | Level 5 | | Level 6 | |
| | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. |
| OECD average | 9.2 | 0.13 | 14.3 | 0.14 | 21.1 | 0.14 | 22.9 | 0.15 | 18.5 | 0.14 | 10.1 | 0.11 | 3.9 | 0.08 |
| Latin America average | 33.6 | 0.53 | 27.2 | 0.39 | 21.8 | 0.30 | 11.6 | 0.29 | 4.5 | 0.18 | 1.2 | 0.08 | 0.2 | 0.03 |
| Albania | 36.4 | 1.22 | 26.2 | 0.98 | 21.2 | 0.90 | 11.4 | 0.65 | 3.9 | 0.43 | 0.8 | 0.18 | † | † |
| Argentina | 34.0 | 2.00 | 29.4 | 1.38 | 22.9 | 1.22 | 10.5 | 0.90 | 2.6 | 0.36 | 0.5 | 0.15 | † | † |
| Australia | 8.4 | 0.35 | 13.8 | 0.45 | 21.2 | 0.60 | 22.8 | 0.60 | 18.3 | 0.49 | 10.5 | 0.47 | 4.9 | 0.39 |
| Austria | 5.0 | 0.54 | 12.4 | 0.90 | 20.9 | 0.98 | 24.6 | 0.83 | 22.3 | 0.97 | 11.3 | 0.78 | 3.5 | 0.49 |
| Belgium | 6.9 | 0.51 | 11.2 | 0.68 | 17.9 | 0.69 | 21.8 | 0.69 | 21.2 | 0.62 | 14.5 | 0.60 | 6.6 | 0.38 |
| Brazil | 36.5 | 1.13 | 27.0 | 0.81 | 20.2 | 0.60 | 10.5 | 0.53 | 4.3 | 0.42 | 1.3 | 0.27 | 0.2! | 0.08 |
| Bulgaria | 20.2 | 1.39 | 21.7 | 0.99 | 23.4 | 1.00 | 18.2 | 0.93 | 10.9 | 0.80 | 4.3 | 0.62 | 1.2 | 0.28 |
| Canada | 5.9 | 0.32 | 11.0 | 0.40 | 19.7 | 0.71 | 24.2 | 0.60 | 20.9 | 0.59 | 12.6 | 0.51 | 5.8 | 0.40 |
| Chile | 24.6 | 1.44 | 26.7 | 0.95 | 23.9 | 0.93 | 15.5 | 0.80 | 7.1 | 0.60 | 1.9 | 0.28 | 0.3 | 0.06 |
| Chinese Taipei | 5.1 | 0.57 | 9.2 | 0.57 | 14.0 | 0.65 | 19.3 | 0.77 | 22.1 | 0.83 | 18.7 | 0.98 | 11.6 | 0.71 |
| Colombia | 43.1 | 1.43 | 27.2 | 0.98 | 18.0 | 0.85 | 8.3 | 0.58 | 2.7 | 0.39 | 0.6 | 0.15 | 0.1! | 0.05 |
| Costa Rica | 27.2 | 1.64 | 30.8 | 1.14 | 25.8 | 1.10 | 11.3 | 0.84 | 3.9 | 0.57 | 0.9! | 0.29 | † | † |
| Croatia | 9.1 | 0.70 | 18.0 | 0.78 | 24.9 | 1.27 | 23.4 | 1.27 | 15.3 | 0.91 | 7.0 | 0.80 | 2.3 | 0.57 |
| Cyprus | 21.6 | 0.54 | 21.2 | 0.67 | 23.8 | 0.72 | 18.5 | 0.64 | 10.3 | 0.51 | 3.7 | 0.29 | 0.9 | 0.18 |
| Czech Republic | 7.7 | 0.77 | 12.4 | 0.84 | 20.6 | 1.02 | 23.5 | 1.07 | 19.8 | 0.92 | 11.0 | 0.71 | 4.9 | 0.51 |
| Denmark | 5.5 | 0.47 | 12.9 | 0.71 | 22.9 | 0.78 | 26.1 | 0.90 | 20.0 | 0.84 | 9.7 | 0.59 | 2.9 | 0.30 |
| Estonia | 2.7 | 0.40 | 8.5 | 0.57 | 19.8 | 0.78 | 27.8 | 0.91 | 24.0 | 0.89 | 12.4 | 0.84 | 4.7 | 0.50 |
| Finland | 2.9 | 0.36 | 8.1 | 0.45 | 19.3 | 0.90 | 27.7 | 0.68 | 24.3 | 0.74 | 12.7 | 0.68 | 5.0 | 0.51 |
| France | 9.4 | 0.80 | 14.1 | 0.78 | 20.7 | 0.81 | 22.3 | 0.76 | 18.9 | 0.76 | 10.7 | 0.72 | 4.0 | 0.47 |
| Germany | 6.1 | 0.71 | 11.6 | 0.69 | 17.7 | 0.76 | 23.4 | 1.01 | 22.1 | 0.85 | 13.5 | 0.79 | 5.6 | 0.59 |
| Greece | 16.4 | 1.00 | 19.3 | 1.23 | 24.4 | 1.10 | 21.5 | 0.81 | 12.7 | 0.78 | 4.5 | 0.39 | 1.1 | 0.20 |
| Hong Kong-China | 3.3 | 0.44 | 5.3 | 0.50 | 11.4 | 0.72 | 18.6 | 0.72 | 24.6 | 0.89 | 22.1 | 0.97 | 14.6 | 0.85 |
| Hungary | 11.7 | 0.88 | 18.1 | 0.99 | 23.5 | 0.95 | 21.6 | 1.11 | 15.3 | 0.89 | 7.5 | 0.76 | 2.4 | 0.43 |
| Iceland | 9.3 | 0.62 | 13.3 | 0.69 | 20.8 | 0.85 | 24.1 | 0.79 | 18.5 | 0.67 | 10.2 | 0.58 | 3.9 | 0.35 |
| Indonesia | 50.0 | 2.14 | 27.1 | 1.57 | 14.8 | 1.18 | 5.8 | 0.86 | 2.0! | 0.64 | † | † | † | † |
| Ireland | 5.9 | 0.56 | 12.0 | 0.68 | 21.8 | 0.86 | 26.0 | 0.72 | 20.6 | 0.72 | 10.4 | 0.58 | 3.3 | 0.34 |
| Israel | 15.6 | 1.22 | 15.2 | 0.86 | 19.1 | 0.95 | 19.8 | 0.81 | 16.2 | 0.80 | 9.4 | 0.76 | 4.8 | 0.61 |
| Italy | 9.6 | 0.44 | 14.6 | 0.47 | 21.7 | 0.47 | 23.6 | 0.54 | 18.0 | 0.49 | 9.2 | 0.39 | 3.3 | 0.23 |
| Japan | 4.9 | 0.64 | 10.3 | 0.75 | 19.5 | 0.80 | 25.2 | 1.02 | 22.3 | 0.93 | 12.7 | 0.83 | 5.1 | 0.62 |
| Jordan | 47.2 | 1.63 | 26.0 | 0.76 | 16.7 | 0.95 | 7.4 | 0.58 | 2.1 | 0.39 | 0.6! | 0.29 | † | † |
| Kazakhstan | 18.5 | 1.01 | 29.5 | 1.22 | 28.1 | 1.05 | 16.1 | 1.09 | 6.2 | 0.84 | 1.4 | 0.38 | 0.2! | 0.09 |
| Korea, Republic of | 3.4 | 0.50 | 7.4 | 0.85 | 16.2 | 0.96 | 23.9 | 1.14 | 25.1 | 0.90 | 17.1 | 0.91 | 6.8 | 0.86 |
| Latvia | 5.9 | 0.61 | 15.4 | 0.99 | 26.5 | 1.34 | 26.6 | 0.98 | 17.8 | 0.96 | 6.5 | 0.65 | 1.2 | 0.25 |
| Liechtenstein | 4.6 | 1.19 | 8.2 | 1.70 | 16.6 | 2.55 | 19.1 | 2.78 | 23.1 | 2.60 | 19.9 | 2.14 | 8.4 | 1.53 |
| Lithuania | 9.1 | 0.66 | 16.1 | 1.01 | 25.1 | 1.24 | 24.1 | 0.93 | 16.0 | 0.78 | 7.4 | 0.52 | 2.2 | 0.35 |
| Luxembourg | 9.2 | 0.48 | 14.5 | 0.76 | 20.8 | 0.61 | 22.8 | 0.79 | 19.3 | 0.76 | 9.8 | 0.64 | 3.6 | 0.36 |
| Macao-China | 3.4 | 0.24 | 8.4 | 0.43 | 17.7 | 0.62 | 24.6 | 0.65 | 25.0 | 0.78 | 15.0 | 0.81 | 5.8 | 0.43 |
| Malaysia | 30.4 | 1.39 | 26.0 | 0.97 | 21.9 | 0.94 | 13.1 | 0.90 | 6.4 | 0.69 | 1.9 | 0.34 | 0.3! | 0.13 |
| Mexico | 25.9 | 0.67 | 27.5 | 0.53 | 25.3 | 0.42 | 14.5 | 0.52 | 5.4 | 0.28 | 1.3 | 0.11 | 0.2 | 0.04 |
| Montenegro, Republic of | 28.5 | 0.73 | 27.5 | 0.76 | 23.8 | 0.98 | 13.7 | 0.81 | 4.9 | 0.51 | 1.3 | 0.26 | † | † |
| Netherlands | 4.2 | 0.69 | 10.3 | 0.82 | 16.4 | 0.97 | 21.3 | 1.28 | 24.0 | 1.08 | 16.9 | 1.06 | 6.9 | 0.70 |
| New Zealand | 8.8 | 0.64 | 14.6 | 0.79 | 21.0 | 0.76 | 21.9 | 0.83 | 18.0 | 0.86 | 10.8 | 0.57 | 4.8 | 0.40 |
| Norway | 7.8 | 0.73 | 14.2 | 0.64 | 23.3 | 0.79 | 25.6 | 0.84 | 18.0 | 0.69 | 8.1 | 0.54 | 3.0 | 0.37 |
| Peru | 47.9 | 1.74 | 24.8 | 0.84 | 15.9 | 0.88 | 7.5 | 0.75 | 2.9 | 0.59 | 0.9! | 0.26 | † | † |
| Poland | 3.1 | 0.40 | 10.5 | 0.80 | 21.1 | 1.00 | 26.9 | 1.33 | 21.6 | 0.95 | 12.2 | 0.91 | 4.4 | 0.68 |
| Portugal | 10.4 | 0.94 | 16.4 | 0.91 | 23.0 | 0.76 | 23.5 | 0.94 | 17.2 | 0.96 | 7.5 | 0.70 | 2.0 | 0.38 |
| Puerto Rico | 37.8 | 2.66 | 34.0 | 1.57 | 20.3 | 1.58 | 6.9 | 1.13 | 0.9! | 0.39 | † | † | † | † |
| Qatar | 48.5 | 0.43 | 21.6 | 0.46 | 14.8 | 0.45 | 8.8 | 0.35 | 4.4 | 0.22 | 1.6 | 0.13 | 0.3 | 0.06 |
| Romania | 18.5 | 1.44 | 24.1 | 1.05 | 24.8 | 0.94 | 18.3 | 1.04 | 9.5 | 0.86 | 3.7 | 0.59 | 1.1! | 0.37 |
| Russian Federation | 9.6 | 0.67 | 16.7 | 1.01 | 25.9 | 1.18 | 24.4 | 0.89 | 15.0 | 0.94 | 6.6 | 0.67 | 1.9 | 0.35 |
| Serbia, Republic of | 15.4 | 1.26 | 21.2 | 0.99 | 25.2 | 1.14 | 19.9 | 1.13 | 11.8 | 0.74 | 4.8 | 0.54 | 1.6 | 0.45 |
| Shanghai-China | 1.3 | 0.25 | 3.7 | 0.48 | 8.8 | 0.55 | 16.3 | 0.80 | 23.7 | 0.92 | 25.3 | 1.05 | 20.9 | 1.00 |
| Singapore | 2.5 | 0.24 | 6.3 | 0.37 | 11.9 | 0.55 | 18.5 | 0.59 | 23.3 | 0.57 | 20.5 | 0.70 | 16.9 | 0.45 |
| Slovak Republic | 11.4 | 1.14 | 15.5 | 1.08 | 21.6 | 0.99 | 21.6 | 1.04 | 17.0 | 0.91 | 9.0 | 0.57 | 3.9 | 0.45 |
| Slovenia | 6.0 | 0.58 | 13.3 | 0.94 | 22.7 | 0.64 | 24.1 | 0.87 | 19.2 | 0.84 | 10.7 | 0.63 | 4.1 | 0.41 |
| Spain | 9.7 | 0.64 | 14.3 | 0.59 | 21.4 | 0.55 | 23.7 | 0.62 | 18.5 | 0.66 | 9.2 | 0.39 | 3.2 | 0.25 |
| Sweden | 10.2 | 0.68 | 15.9 | 0.78 | 23.5 | 0.76 | 23.9 | 0.88 | 16.6 | 0.83 | 7.5 | 0.56 | 2.4 | 0.26 |
| Switzerland | 4.0 | 0.36 | 8.9 | 0.52 | 17.3 | 0.86 | 23.7 | 0.75 | 23.9 | 0.89 | 15.0 | 0.79 | 7.1 | 0.72 |
| Thailand | 24.6 | 1.33 | 28.5 | 1.11 | 24.9 | 0.96 | 13.8 | 0.93 | 5.8 | 0.69 | 2.0 | 0.41 | 0.4! | 0.16 |
| Tunisia | 42.4 | 2.09 | 26.4 | 1.14 | 19.0 | 1.18 | 8.4 | 0.67 | 2.8 | 0.67 | 0.7! | 0.34 | † | † |
| Turkey | 19.6 | 1.32 | 24.8 | 1.22 | 23.3 | 1.12 | 16.4 | 1.08 | 10.1 | 1.09 | 4.8 | 0.81 | 1.0! | 0.34 |
| United Arab Emirates | 24.3 | 0.96 | 22.9 | 0.83 | 22.3 | 0.70 | 16.4 | 0.58 | 9.4 | 0.68 | 3.6 | 0.31 | 1.0 | 0.18 |
| United Kingdom | 9.4 | 0.95 | 14.3 | 0.96 | 21.2 | 0.78 | 23.0 | 0.91 | 18.4 | 0.79 | 9.8 | 0.60 | 3.8 | 0.41 |
| United States | 10.9 | 1.01 | 18.3 | 1.06 | 24.0 | 0.78 | 21.5 | 0.97 | 14.7 | 0.93 | 7.6 | 0.66 | 3.0 | 0.41 |
| Uruguay | 29.9 | 1.27 | 24.0 | 0.95 | 22.3 | 0.81 | 14.7 | 0.77 | 6.8 | 0.56 | 2.0 | 0.30 | 0.3! | 0.11 |
| Vietnam | 5.4 | 1.04 | 11.2 | 1.09 | 22.4 | 1.40 | 26.1 | 1.38 | 20.3 | 1.20 | 10.5 | 1.03 | 4.2 | 0.85 |
| Education systems under the U.S. PISA national center | | | | | | | | | | | | | | |
| Connecticut | 9.4 | 1.43 | 13.5 | 1.29 | 19.2 | 1.24 | 22.0 | 1.18 | 19.4 | 1.59 | 11.5 | 1.47 | 5.1 | 1.01 |
| Florida | 14.6 | 1.83 | 20.8 | 1.73 | 25.1 | 1.31 | 21.4 | 1.78 | 12.1 | 1.12 | 4.9 | 0.96 | 1.1! | 0.38 |
| Massachusetts | 7.9 | 1.00 | 12.6 | 1.12 | 19.9 | 1.89 | 23.7 | 1.45 | 18.5 | 1.14 | 11.8 | 1.59 | 5.6 | 1.08 |

See notes at end of table.

Table C-4. Standard errors for table 4: Percentage distribution of 15-year-old students on PISA mathematics literacy content subscales, by proficiency level and education system: 2012 (continued)

| Education system | Uncertainty and data | | | | | | | | | | | | | |
|--|----------------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|----------|----------|----------|----------|----------|----------|
| | Below level 1 | | Level 1 | | Level 2 | | Level 3 | | Level 4 | | Level 5 | | Level 6 | |
| | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. |
| OECD average | 8.3 | 0.12 | 14.7 | 0.13 | 22.5 | 0.15 | 23.8 | 0.16 | 18.1 | 0.14 | 9.2 | 0.11 | 3.3 | 0.07 |
| Latin America average | 27.4 | 0.53 | 33.1 | 0.34 | 25.5 | 0.36 | 10.7 | 0.28 | 2.8 | 0.15 | 0.4 | 0.05 | #! | † |
| Albania | 36.3 | 1.06 | 27.0 | 1.00 | 21.6 | 1.04 | 10.9 | 0.62 | 3.5 | 0.44 | 0.7 | 0.17 | † | † |
| Argentina | 35.0 | 1.87 | 30.0 | 1.21 | 22.8 | 1.26 | 9.7 | 0.93 | 2.2 | 0.40 | 0.4 | 0.10 | † | † |
| Australia | 6.0 | 0.33 | 12.5 | 0.38 | 21.4 | 0.50 | 24.6 | 0.66 | 19.8 | 0.62 | 11.1 | 0.43 | 4.6 | 0.34 |
| Austria | 7.3 | 0.81 | 13.8 | 0.85 | 21.4 | 0.87 | 24.1 | 0.90 | 20.9 | 0.88 | 9.7 | 0.64 | 2.8 | 0.34 |
| Belgium | 8.8 | 0.76 | 12.0 | 0.54 | 19.1 | 0.68 | 21.8 | 0.75 | 19.2 | 0.65 | 12.5 | 0.47 | 6.5 | 0.48 |
| Brazil | 26.5 | 1.01 | 35.1 | 1.00 | 25.5 | 0.79 | 10.0 | 0.52 | 2.5 | 0.38 | 0.3! | 0.12 | † | † |
| Bulgaria | 20.7 | 1.51 | 24.8 | 0.98 | 25.8 | 1.02 | 18.0 | 0.92 | 8.1 | 0.72 | 2.3 | 0.42 | 0.3! | 0.13 |
| Canada | 4.1 | 0.28 | 10.1 | 0.51 | 20.9 | 0.73 | 26.8 | 0.61 | 21.9 | 0.61 | 12.1 | 0.51 | 4.0 | 0.29 |
| Chile | 16.8 | 1.17 | 29.4 | 0.97 | 29.3 | 1.05 | 17.1 | 0.88 | 6.2 | 0.56 | 1.1 | 0.18 | 0.1! | 0.05 |
| Chinese Taipei | 4.4 | 0.50 | 8.6 | 0.55 | 14.4 | 0.65 | 19.2 | 0.93 | 21.5 | 0.81 | 18.7 | 0.90 | 13.1 | 1.01 |
| Colombia | 32.4 | 1.39 | 36.8 | 1.11 | 23.0 | 1.16 | 6.6 | 0.67 | 1.2 | 0.23 | 0.1! | 0.06 | † | † |
| Costa Rica | 17.8 | 1.51 | 37.1 | 1.33 | 31.1 | 1.39 | 11.8 | 1.11 | 2.1 | 0.37 | † | † | † | † |
| Croatia | 10.8 | 0.83 | 19.8 | 0.92 | 26.4 | 1.02 | 22.6 | 1.00 | 13.6 | 0.86 | 5.3 | 0.68 | 1.4 | 0.41 |
| Cyprus | 17.5 | 0.57 | 22.2 | 0.82 | 26.9 | 0.86 | 20.8 | 0.67 | 9.5 | 0.48 | 2.7 | 0.26 | 0.4! | 0.17 |
| Czech Republic | 7.7 | 0.78 | 15.1 | 0.87 | 24.5 | 0.84 | 25.2 | 0.98 | 17.5 | 0.90 | 7.7 | 0.56 | 2.2 | 0.26 |
| Denmark | 4.5 | 0.50 | 11.6 | 0.82 | 23.3 | 0.95 | 27.8 | 0.89 | 21.2 | 0.81 | 9.4 | 0.68 | 2.3 | 0.34 |
| Estonia | 2.9 | 0.34 | 10.1 | 0.60 | 23.8 | 1.14 | 29.7 | 0.94 | 21.7 | 0.95 | 9.3 | 0.57 | 2.5 | 0.35 |
| Finland | 4.2 | 0.46 | 9.5 | 0.50 | 19.7 | 0.67 | 27.4 | 0.73 | 22.9 | 0.79 | 11.9 | 0.62 | 4.4 | 0.39 |
| France | 10.5 | 0.71 | 14.1 | 0.78 | 20.3 | 0.88 | 22.6 | 0.87 | 19.5 | 0.68 | 9.8 | 0.59 | 3.2 | 0.37 |
| Germany | 7.2 | 0.59 | 12.3 | 0.70 | 19.9 | 0.85 | 22.9 | 0.93 | 20.4 | 0.83 | 12.4 | 0.86 | 5.0 | 0.61 |
| Greece | 12.3 | 0.90 | 19.4 | 0.80 | 27.5 | 0.88 | 24.2 | 0.87 | 12.2 | 0.69 | 3.8 | 0.36 | 0.7 | 0.15 |
| Hong Kong-China | 2.3 | 0.34 | 6.0 | 0.63 | 13.2 | 0.73 | 22.5 | 0.91 | 26.9 | 1.00 | 20.0 | 0.88 | 9.2 | 0.81 |
| Hungary | 10.9 | 0.92 | 16.9 | 0.97 | 25.2 | 1.10 | 23.1 | 1.25 | 15.4 | 0.88 | 6.9 | 0.83 | 1.7 | 0.43 |
| Iceland | 8.8 | 0.58 | 13.2 | 0.66 | 21.2 | 0.75 | 24.5 | 0.90 | 19.5 | 0.82 | 9.8 | 0.57 | 3.1 | 0.38 |
| Indonesia | 35.7 | 2.08 | 36.1 | 1.61 | 20.4 | 1.26 | 6.2 | 0.90 | 1.3! | 0.56 | † | † | † | † |
| Ireland | 4.7 | 0.55 | 11.1 | 0.61 | 21.3 | 0.85 | 27.7 | 0.90 | 22.2 | 0.80 | 10.1 | 0.60 | 2.8 | 0.31 |
| Israel | 16.7 | 1.21 | 16.9 | 0.88 | 21.4 | 0.95 | 20.9 | 0.78 | 14.3 | 1.07 | 7.1 | 0.81 | 2.6 | 0.41 |
| Italy | 9.8 | 0.48 | 15.9 | 0.56 | 23.5 | 0.59 | 24.3 | 0.60 | 16.8 | 0.52 | 7.5 | 0.39 | 2.1 | 0.19 |
| Japan | 3.2 | 0.52 | 8.7 | 0.67 | 18.0 | 0.93 | 26.2 | 0.97 | 24.2 | 0.96 | 14.5 | 0.95 | 5.2 | 0.67 |
| Jordan | 30.3 | 1.52 | 33.6 | 0.92 | 24.3 | 1.10 | 9.4 | 0.65 | 1.8 | 0.34 | † | † | † | † |
| Kazakhstan | 17.1 | 1.28 | 37.4 | 1.50 | 33.1 | 1.17 | 11.1 | 1.21 | 1.3 | 0.32 | † | † | † | † |
| Korea, Republic of | 3.6 | 0.49 | 7.6 | 0.74 | 16.7 | 0.82 | 23.6 | 0.99 | 23.8 | 0.86 | 16.4 | 0.87 | 8.3 | 0.93 |
| Latvia | 6.1 | 0.63 | 17.5 | 0.97 | 28.3 | 1.29 | 27.6 | 0.98 | 15.4 | 1.15 | 4.3 | 0.55 | 0.7 | 0.17 |
| Liechtenstein | 5.0 | 1.31 | 9.9 | 2.15 | 18.1 | 2.05 | 22.2 | 3.11 | 22.7 | 2.65 | 15.4 | 2.32 | 6.7 | 1.42 |
| Lithuania | 10.1 | 0.66 | 17.9 | 0.91 | 26.2 | 0.81 | 23.8 | 0.96 | 14.6 | 0.66 | 6.1 | 0.50 | 1.4 | 0.27 |
| Luxembourg | 11.2 | 0.55 | 16.7 | 0.53 | 21.6 | 0.67 | 22.0 | 1.04 | 17.4 | 0.72 | 8.4 | 0.46 | 2.7 | 0.25 |
| Macao-China | 3.5 | 0.25 | 8.5 | 0.53 | 18.7 | 0.55 | 26.3 | 0.68 | 24.8 | 0.79 | 13.7 | 0.60 | 4.5 | 0.28 |
| Malaysia | 21.6 | 1.16 | 27.6 | 0.95 | 28.4 | 1.02 | 15.8 | 0.74 | 5.5 | 0.67 | 1.1 | 0.25 | † | † |
| Mexico | 20.2 | 0.64 | 34.4 | 0.58 | 30.4 | 0.58 | 12.3 | 0.42 | 2.4 | 0.15 | 0.2 | 0.04 | † | † |
| Montenegro, Republic of | 25.3 | 0.75 | 28.3 | 1.00 | 25.5 | 0.94 | 14.0 | 0.92 | 5.5 | 0.55 | 1.2 | 0.22 | † | † |
| Netherlands | 4.1 | 0.74 | 10.2 | 0.84 | 17.3 | 1.11 | 21.7 | 1.48 | 22.0 | 1.03 | 16.7 | 1.17 | 8.0 | 0.82 |
| New Zealand | 8.0 | 0.64 | 13.5 | 0.79 | 20.5 | 0.80 | 21.8 | 0.84 | 18.6 | 0.90 | 11.4 | 0.72 | 6.2 | 0.51 |
| Norway | 6.5 | 0.59 | 12.8 | 0.75 | 23.7 | 0.98 | 26.7 | 0.99 | 19.3 | 0.85 | 8.5 | 0.61 | 2.6 | 0.30 |
| Peru | 42.2 | 1.75 | 32.1 | 1.04 | 18.1 | 0.99 | 5.9 | 0.66 | 1.4 | 0.36 | † | † | † | † |
| Poland | 3.3 | 0.37 | 10.7 | 0.89 | 21.4 | 0.85 | 26.9 | 0.96 | 22.2 | 0.93 | 11.6 | 0.93 | 4.0 | 0.74 |
| Portugal | 8.4 | 0.75 | 15.9 | 1.04 | 23.5 | 0.88 | 25.1 | 0.90 | 17.7 | 0.97 | 7.9 | 0.69 | 1.5 | 0.30 |
| Puerto Rico | 29.0 | 2.12 | 38.1 | 1.95 | 25.4 | 1.62 | 6.6 | 1.15 | † | † | † | † | † | † |
| Qatar | 44.4 | 0.60 | 23.3 | 0.76 | 16.0 | 0.43 | 9.4 | 0.37 | 4.7 | 0.21 | 1.9 | 0.16 | 0.3 | 0.06 |
| Romania | 15.0 | 1.20 | 27.3 | 1.33 | 30.6 | 1.28 | 18.9 | 1.00 | 6.7 | 0.76 | 1.4 | 0.35 | † | † |
| Russian Federation | 10.5 | 0.94 | 20.2 | 0.86 | 28.4 | 0.84 | 24.0 | 1.06 | 12.6 | 0.76 | 3.9 | 0.49 | 0.5! | 0.18 |
| Serbia, Republic of | 14.3 | 1.26 | 23.2 | 1.33 | 28.6 | 1.31 | 20.6 | 0.96 | 9.8 | 0.73 | 2.9 | 0.42 | 0.6! | 0.19 |
| Shanghai-China | 1.0 | 0.20 | 3.4 | 0.42 | 9.0 | 0.66 | 17.0 | 0.71 | 23.6 | 0.78 | 24.3 | 0.92 | 21.7 | 1.06 |
| Singapore | 2.7 | 0.23 | 7.0 | 0.45 | 14.2 | 0.58 | 19.4 | 0.68 | 22.7 | 0.73 | 18.9 | 0.79 | 15.1 | 0.56 |
| Slovak Republic | 12.7 | 1.12 | 17.1 | 0.99 | 24.3 | 1.00 | 22.2 | 1.02 | 15.0 | 0.80 | 6.6 | 0.56 | 2.1 | 0.41 |
| Slovenia | 6.4 | 0.40 | 15.2 | 0.62 | 23.4 | 0.76 | 24.2 | 0.75 | 18.3 | 0.75 | 9.9 | 0.58 | 2.6 | 0.40 |
| Spain | 8.5 | 0.53 | 15.0 | 0.55 | 23.3 | 0.64 | 25.4 | 0.60 | 18.3 | 0.60 | 7.7 | 0.44 | 1.9 | 0.18 |
| Sweden | 9.1 | 0.65 | 15.8 | 0.67 | 24.9 | 1.00 | 24.6 | 0.81 | 16.5 | 0.84 | 7.0 | 0.54 | 2.1 | 0.29 |
| Switzerland | 5.0 | 0.46 | 9.9 | 0.58 | 18.9 | 0.89 | 24.4 | 0.71 | 22.4 | 0.99 | 13.4 | 0.87 | 6.0 | 0.60 |
| Thailand | 15.3 | 0.93 | 29.1 | 1.25 | 31.4 | 0.85 | 16.5 | 0.92 | 5.8 | 0.69 | 1.6 | 0.38 | 0.3! | 0.15 |
| Tunisia | 27.8 | 1.76 | 35.3 | 1.27 | 25.2 | 1.30 | 8.8 | 0.85 | 2.4 | 0.71 | † | † | † | † |
| Turkey | 15.8 | 1.01 | 25.0 | 1.18 | 26.3 | 0.99 | 17.8 | 1.21 | 9.6 | 1.16 | 4.5 | 0.78 | 0.9! | 0.31 |
| United Arab Emirates | 19.6 | 0.86 | 26.9 | 0.94 | 26.0 | 0.67 | 17.3 | 0.73 | 7.5 | 0.49 | 2.2 | 0.30 | 0.5 | 0.12 |
| United Kingdom | 6.9 | 0.62 | 13.1 | 0.77 | 21.4 | 1.03 | 24.6 | 0.89 | 19.9 | 0.68 | 10.2 | 0.67 | 3.8 | 0.44 |
| United States | 7.1 | 0.70 | 16.0 | 0.99 | 24.9 | 0.92 | 24.8 | 0.99 | 17.6 | 1.11 | 7.4 | 0.76 | 2.1 | 0.33 |
| Uruguay | 27.8 | 1.34 | 30.3 | 0.95 | 24.1 | 0.96 | 12.4 | 0.88 | 4.5 | 0.59 | 0.8 | 0.23 | † | † |
| Vietnam | 2.5 | 0.57 | 8.4 | 1.11 | 20.4 | 1.32 | 29.8 | 1.26 | 25.9 | 1.39 | 10.5 | 1.10 | 2.5 | 0.54 |
| Education systems under the U.S. PISA national center | | | | | | | | | | | | | | |
| Connecticut | 5.8 | 1.08 | 12.6 | 1.25 | 20.2 | 1.34 | 24.1 | 1.75 | 19.9 | 1.77 | 12.2 | 1.37 | 5.3 | 1.12 |
| Florida | 7.5 | 1.32 | 19.1 | 1.61 | 28.1 | 1.57 | 25.2 | 1.60 | 14.2 | 1.44 | 4.6 | 0.92 | 1.3! | 0.48 |
| Massachusetts | 3.9 | 0.73 | 10.2 | 1.26 | 20.1 | 1.68 | 25.1 | 1.33 | 21.1 | 1.22 | 13.3 | 1.65 | 6.3 | 1.21 |

See notes at end of table.

Table C-4. Standard errors for table 4: Percentage distribution of 15-year-old students on PISA mathematics literacy content subscales, by proficiency level and education system: 2012 (continued)

| Education system | Change and relationships | | | | | | | | | | | | | |
|--|--------------------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|----------|----------|----------|----------|
| | Below level 1 | | Level 1 | | Level 2 | | Level 3 | | Level 4 | | Level 5 | | Level 6 | |
| | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. |
| OECD average | 10.4 | 0.14 | 14.5 | 0.13 | 20.9 | 0.15 | 22.2 | 0.15 | 17.5 | 0.14 | 9.9 | 0.12 | 4.6 | 0.10 |
| Latin America average | 39.6 | 0.61 | 25.7 | 0.33 | 19.3 | 0.33 | 10.3 | 0.28 | 3.9 | 0.17 | 1.1 | 0.08 | 0.2 | 0.03 |
| Albania | 36.0 | 1.04 | 26.6 | 0.75 | 21.2 | 0.80 | 11.4 | 0.60 | 3.8 | 0.34 | 0.9 | 0.25 | ‡ | † |
| Argentina | 40.8 | 2.11 | 26.9 | 0.94 | 19.5 | 1.19 | 9.8 | 0.85 | 2.5 | 0.42 | 0.5 | 0.15 | ‡ | † |
| Australia | 7.3 | 0.34 | 12.8 | 0.48 | 20.3 | 0.46 | 22.8 | 0.56 | 18.9 | 0.56 | 11.7 | 0.44 | 6.2 | 0.41 |
| Austria | 8.8 | 0.83 | 12.6 | 0.82 | 19.2 | 0.84 | 21.3 | 0.89 | 19.8 | 1.09 | 12.3 | 0.86 | 5.9 | 0.69 |
| Belgium | 9.5 | 0.70 | 10.2 | 0.49 | 16.7 | 0.58 | 21.1 | 0.58 | 21.0 | 0.66 | 14.6 | 0.58 | 7.0 | 0.46 |
| Brazil | 46.3 | 1.14 | 24.0 | 0.71 | 16.5 | 0.76 | 8.4 | 0.61 | 3.3 | 0.40 | 1.1 | 0.22 | 0.3! | 0.11 |
| Bulgaria | 24.9 | 1.53 | 21.8 | 0.92 | 21.1 | 0.80 | 15.9 | 0.75 | 9.7 | 0.80 | 4.7 | 0.55 | 1.8 | 0.39 |
| Canada | 4.1 | 0.30 | 9.4 | 0.55 | 18.9 | 0.66 | 25.6 | 0.63 | 22.1 | 0.62 | 13.7 | 0.49 | 6.2 | 0.38 |
| Chile | 29.7 | 1.48 | 26.0 | 1.02 | 21.6 | 0.87 | 14.0 | 0.85 | 6.5 | 0.60 | 2.0 | 0.27 | 0.3 | 0.09 |
| Chinese Taipei | 5.2 | 0.52 | 8.5 | 0.59 | 12.8 | 0.59 | 17.3 | 0.71 | 18.8 | 0.78 | 18.1 | 1.25 | 19.4 | 1.09 |
| Colombia | 52.2 | 1.67 | 24.7 | 0.92 | 14.4 | 0.90 | 6.1 | 0.62 | 2.0 | 0.31 | 0.6 | 0.15 | ‡ | † |
| Costa Rica | 29.3 | 1.81 | 31.0 | 1.37 | 24.1 | 1.35 | 11.3 | 1.04 | 3.6 | 0.49 | 0.7 | 0.19 | ‡ | † |
| Croatia | 14.7 | 1.11 | 18.4 | 0.80 | 22.7 | 0.93 | 20.9 | 0.99 | 14.1 | 0.86 | 6.7 | 0.86 | 2.5 | 0.66 |
| Cyprus | 21.0 | 0.63 | 21.6 | 0.91 | 23.4 | 0.73 | 18.1 | 0.67 | 10.8 | 0.69 | 4.0 | 0.31 | 1.1 | 0.22 |
| Czech Republic | 9.1 | 0.84 | 12.6 | 0.95 | 20.4 | 1.13 | 22.9 | 0.99 | 18.8 | 0.89 | 10.7 | 0.79 | 5.5 | 0.41 |
| Denmark | 6.6 | 0.64 | 14.7 | 0.69 | 23.7 | 0.71 | 25.9 | 0.88 | 18.0 | 0.68 | 8.6 | 0.62 | 2.6 | 0.32 |
| Estonia | 1.9 | 0.31 | 7.5 | 0.58 | 19.6 | 0.86 | 28.0 | 0.79 | 24.7 | 1.01 | 13.2 | 0.67 | 5.1 | 0.48 |
| Finland | 4.5 | 0.52 | 9.7 | 0.65 | 19.6 | 0.79 | 26.2 | 0.80 | 21.9 | 0.80 | 12.1 | 0.55 | 6.0 | 0.47 |
| France | 10.4 | 0.93 | 13.1 | 0.73 | 19.6 | 0.88 | 22.8 | 0.82 | 18.9 | 0.73 | 10.4 | 0.71 | 4.7 | 0.55 |
| Germany | 8.6 | 0.80 | 10.6 | 0.71 | 17.2 | 0.74 | 21.4 | 0.88 | 20.3 | 0.99 | 14.4 | 0.93 | 7.6 | 0.76 |
| Greece | 18.9 | 1.16 | 20.9 | 0.81 | 23.7 | 0.82 | 19.8 | 1.04 | 11.4 | 0.72 | 4.2 | 0.39 | 1.0 | 0.21 |
| Hong Kong-China | 3.3 | 0.45 | 5.9 | 0.71 | 11.9 | 0.82 | 18.8 | 0.88 | 24.1 | 0.90 | 21.0 | 0.94 | 15.0 | 0.94 |
| Hungary | 11.1 | 1.09 | 16.7 | 0.97 | 22.9 | 1.21 | 22.6 | 1.01 | 15.4 | 0.87 | 8.1 | 0.77 | 3.2 | 0.69 |
| Iceland | 10.5 | 0.71 | 14.5 | 0.70 | 22.7 | 1.06 | 23.4 | 1.15 | 17.4 | 1.03 | 8.6 | 0.66 | 2.9 | 0.33 |
| Indonesia | 48.1 | 2.10 | 29.0 | 1.45 | 15.5 | 1.23 | 5.8 | 1.00 | 1.4! | 0.54 | ‡ | † | ‡ | † |
| Ireland | 5.3 | 0.64 | 12.3 | 0.73 | 23.2 | 0.97 | 28.0 | 0.88 | 19.8 | 0.75 | 9.0 | 0.54 | 2.4 | 0.27 |
| Israel | 19.2 | 1.42 | 16.8 | 0.88 | 19.7 | 1.13 | 19.2 | 0.90 | 14.1 | 0.88 | 7.5 | 0.73 | 3.5 | 0.50 |
| Italy | 11.8 | 0.52 | 16.4 | 0.54 | 23.3 | 0.55 | 23.1 | 0.51 | 15.9 | 0.46 | 7.2 | 0.39 | 2.3 | 0.24 |
| Japan | 4.7 | 0.58 | 8.1 | 0.60 | 15.9 | 0.73 | 21.7 | 0.95 | 21.3 | 0.85 | 16.4 | 0.82 | 11.9 | 1.10 |
| Jordan | 37.2 | 1.65 | 27.8 | 0.82 | 21.4 | 0.98 | 10.4 | 0.73 | 2.5 | 0.36 | ‡ | † | ‡ | † |
| Kazakhstan | 18.4 | 0.96 | 26.5 | 1.12 | 27.6 | 0.98 | 18.2 | 0.97 | 7.1 | 0.81 | 1.8 | 0.35 | 0.4! | 0.13 |
| Korea, Republic of | 3.2 | 0.54 | 6.4 | 0.71 | 13.8 | 0.83 | 20.9 | 0.94 | 22.3 | 0.98 | 18.6 | 1.00 | 14.8 | 1.41 |
| Latvia | 6.2 | 0.76 | 13.9 | 1.07 | 23.7 | 0.97 | 25.9 | 0.99 | 19.1 | 1.00 | 8.8 | 0.70 | 2.4 | 0.39 |
| Liechtenstein | 4.7 | 1.24 | 9.2 | 2.07 | 15.0 | 2.19 | 19.9 | 2.69 | 20.3 | 2.90 | 20.1 | 2.63 | 10.8 | 1.85 |
| Lithuania | 8.9 | 0.74 | 17.2 | 0.93 | 25.5 | 0.90 | 24.3 | 1.10 | 15.6 | 0.78 | 6.7 | 0.56 | 1.8 | 0.31 |
| Luxembourg | 11.2 | 0.53 | 15.3 | 0.57 | 21.1 | 0.78 | 21.8 | 0.77 | 18.1 | 0.68 | 9.4 | 0.51 | 3.2 | 0.29 |
| Macao-China | 3.5 | 0.23 | 7.6 | 0.38 | 15.4 | 0.61 | 22.9 | 0.66 | 23.8 | 0.86 | 17.3 | 0.70 | 9.5 | 0.53 |
| Malaysia | 33.3 | 1.65 | 26.3 | 0.96 | 21.4 | 0.97 | 12.0 | 0.82 | 5.4 | 0.59 | 1.4 | 0.31 | 0.2! | 0.10 |
| Mexico | 29.4 | 0.80 | 28.1 | 0.51 | 24.2 | 0.50 | 12.7 | 0.44 | 4.4 | 0.23 | 1.0 | 0.10 | 0.1 | 0.04 |
| Montenegro, Republic of | 34.7 | 0.65 | 25.4 | 0.82 | 20.5 | 0.82 | 12.9 | 0.55 | 4.9 | 0.52 | 1.3 | 0.27 | ‡ | † |
| Netherlands | 6.0 | 0.82 | 10.4 | 0.90 | 18.0 | 1.13 | 22.6 | 1.08 | 23.0 | 1.16 | 15.0 | 1.02 | 5.0 | 0.59 |
| New Zealand | 10.3 | 0.67 | 14.1 | 0.71 | 19.5 | 0.71 | 20.7 | 0.77 | 17.6 | 0.79 | 11.1 | 0.81 | 6.7 | 0.49 |
| Norway | 12.1 | 0.77 | 16.5 | 0.87 | 22.3 | 0.92 | 23.4 | 0.83 | 15.6 | 0.84 | 7.2 | 0.51 | 3.0 | 0.34 |
| Peru | 55.3 | 1.88 | 21.0 | 0.79 | 13.6 | 0.90 | 6.5 | 0.81 | 2.6 | 0.44 | 0.8! | 0.26 | ‡ | † |
| Poland | 6.4 | 0.58 | 12.8 | 0.82 | 21.1 | 0.91 | 23.8 | 0.90 | 19.0 | 0.91 | 11.2 | 0.76 | 5.7 | 0.92 |
| Portugal | 10.3 | 0.92 | 15.5 | 0.98 | 22.6 | 0.79 | 22.7 | 1.03 | 17.2 | 1.00 | 9.1 | 0.67 | 2.6 | 0.36 |
| Puerto Rico | 47.8 | 2.72 | 28.3 | 1.76 | 16.0 | 1.59 | 6.2 | 0.85 | 1.4! | 0.59 | ‡ | † | ‡ | † |
| Qatar | 52.0 | 0.47 | 19.6 | 0.51 | 13.7 | 0.32 | 8.2 | 0.28 | 4.5 | 0.27 | 1.7 | 0.15 | 0.4 | 0.08 |
| Romania | 16.1 | 1.21 | 25.3 | 1.06 | 26.0 | 0.97 | 18.7 | 1.03 | 9.5 | 0.86 | 3.4 | 0.56 | 1.1 | 0.33 |
| Russian Federation | 7.6 | 0.74 | 14.7 | 0.94 | 23.2 | 0.91 | 26.3 | 1.03 | 17.5 | 0.87 | 8.0 | 0.64 | 2.7 | 0.38 |
| Serbia, Republic of | 21.1 | 1.45 | 21.4 | 0.87 | 23.3 | 0.93 | 17.9 | 1.02 | 10.2 | 0.71 | 4.4 | 0.59 | 1.7 | 0.42 |
| Shanghai-China | 1.0 | 0.22 | 3.0 | 0.40 | 7.4 | 0.55 | 12.8 | 0.62 | 17.7 | 0.78 | 21.8 | 0.83 | 36.2 | 1.30 |
| Singapore | 2.7 | 0.25 | 6.3 | 0.45 | 11.4 | 0.49 | 16.5 | 0.64 | 20.7 | 0.65 | 19.5 | 0.64 | 22.9 | 0.64 |
| Slovak Republic | 15.2 | 1.12 | 15.0 | 0.92 | 21.3 | 1.00 | 21.3 | 1.05 | 15.5 | 0.99 | 8.1 | 0.64 | 3.6 | 0.57 |
| Slovenia | 7.4 | 0.52 | 14.8 | 1.04 | 22.3 | 1.07 | 22.6 | 0.86 | 17.7 | 0.68 | 10.4 | 0.64 | 4.8 | 0.42 |
| Spain | 9.4 | 0.54 | 15.8 | 0.70 | 24.2 | 0.61 | 24.8 | 0.53 | 17.3 | 0.51 | 6.9 | 0.31 | 1.6 | 0.17 |
| Sweden | 14.9 | 0.84 | 17.5 | 0.69 | 22.3 | 1.07 | 20.6 | 0.83 | 14.8 | 0.69 | 7.3 | 0.61 | 2.6 | 0.31 |
| Switzerland | 4.9 | 0.41 | 9.9 | 0.57 | 17.5 | 0.82 | 22.7 | 0.64 | 21.7 | 0.80 | 14.9 | 0.86 | 8.5 | 0.87 |
| Thailand | 27.7 | 1.43 | 27.1 | 0.95 | 23.5 | 0.85 | 13.2 | 0.89 | 5.7 | 0.61 | 2.2 | 0.42 | 0.7! | 0.22 |
| Tunisia | 41.6 | 2.05 | 26.8 | 1.14 | 19.1 | 1.04 | 8.7 | 0.78 | 2.8 | 0.64 | 0.9! | 0.37 | ‡ | † |
| Turkey | 16.2 | 1.29 | 25.0 | 1.22 | 25.6 | 1.15 | 17.3 | 1.11 | 10.4 | 1.14 | 4.3 | 0.77 | 1.2! | 0.50 |
| United Arab Emirates | 18.6 | 0.89 | 24.0 | 0.91 | 24.9 | 0.62 | 18.3 | 0.77 | 9.3 | 0.58 | 3.9 | 0.40 | 1.1 | 0.20 |
| United Kingdom | 8.4 | 0.86 | 13.9 | 0.78 | 22.2 | 0.71 | 23.9 | 0.83 | 17.7 | 0.73 | 9.9 | 0.74 | 3.9 | 0.47 |
| United States | 7.9 | 0.73 | 17.0 | 0.96 | 24.0 | 0.92 | 23.9 | 0.91 | 15.7 | 0.79 | 8.2 | 0.69 | 3.3 | 0.39 |
| Uruguay | 33.9 | 1.29 | 23.5 | 0.82 | 20.4 | 0.90 | 13.2 | 0.72 | 6.5 | 0.58 | 1.9 | 0.31 | 0.5! | 0.20 |
| Vietnam | 5.3 | 1.00 | 11.7 | 1.14 | 21.7 | 1.28 | 26.2 | 1.19 | 20.1 | 1.07 | 10.7 | 0.93 | 4.4 | 0.73 |
| Education systems under the U.S. PISA national center | | | | | | | | | | | | | | |
| Connecticut | 7.0 | 1.31 | 12.5 | 1.40 | 19.7 | 1.46 | 22.3 | 1.43 | 18.2 | 1.33 | 12.8 | 1.39 | 7.6 | 1.12 |
| Florida | 9.1 | 1.35 | 18.8 | 1.49 | 26.3 | 1.48 | 23.4 | 1.27 | 14.2 | 1.50 | 6.3 | 1.18 | 2.0! | 0.66 |
| Massachusetts | 6.2 | 0.94 | 11.9 | 1.06 | 19.4 | 1.59 | 22.0 | 1.42 | 20.1 | 1.29 | 12.5 | 1.34 | 8.0 | 1.42 |

See notes at end of table.

Table C-4. Standard errors for table 4: Percentage distribution of 15-year-old students on PISA mathematics literacy content subscales, by proficiency level and education system: 2012 (continued)

| Education system | Space and shape | | | | | | | | | | | | | |
|--|-----------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|----------|----------|----------|----------|----------|----------|
| | Below level 1 | | Level 1 | | Level 2 | | Level 3 | | Level 4 | | Level 5 | | Level 6 | |
| | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. |
| OECD average | 10.0 | 0.13 | 15.8 | 0.14 | 22.3 | 0.15 | 22.2 | 0.16 | 16.3 | 0.14 | 8.9 | 0.11 | 4.5 | 0.10 |
| Latin America average | 34.5 | 0.61 | 29.5 | 0.30 | 21.3 | 0.38 | 10.1 | 0.33 | 3.6 | 0.18 | 0.9 | 0.07 | 0.1 | 0.03 |
| <i>Albania</i> | 27.0 | 0.98 | 23.9 | 1.06 | 22.8 | 0.86 | 15.3 | 0.85 | 7.3 | 0.54 | 2.6 | 0.28 | 1.0 | 0.21 |
| <i>Argentina</i> | 36.5 | 2.04 | 31.6 | 1.10 | 21.4 | 1.29 | 8.4 | 0.75 | 1.9 | 0.30 | 0.3 | 0.09 | † | † |
| Australia | 8.1 | 0.39 | 15.3 | 0.50 | 21.9 | 0.55 | 23.5 | 0.49 | 16.9 | 0.53 | 9.3 | 0.46 | 5.0 | 0.42 |
| Austria | 7.3 | 0.69 | 13.7 | 0.85 | 21.8 | 0.88 | 23.7 | 0.98 | 19.0 | 0.85 | 10.2 | 0.69 | 4.3 | 0.68 |
| Belgium | 8.4 | 0.67 | 12.7 | 0.71 | 19.4 | 0.90 | 21.7 | 0.99 | 18.4 | 0.75 | 12.4 | 0.48 | 6.9 | 0.42 |
| <i>Brazil</i> | 40.3 | 1.02 | 30.6 | 0.71 | 18.8 | 0.63 | 7.3 | 0.42 | 2.4 | 0.34 | 0.6 | 0.18 | 0.1 | 0.05 |
| <i>Bulgaria</i> | 19.1 | 1.46 | 23.2 | 1.00 | 24.9 | 1.00 | 18.0 | 0.95 | 10.1 | 0.79 | 3.8 | 0.52 | 0.9 | 0.24 |
| Canada | 5.3 | 0.33 | 12.0 | 0.50 | 22.0 | 0.57 | 24.7 | 0.58 | 19.9 | 0.61 | 11.0 | 0.49 | 5.1 | 0.38 |
| Chile | 25.0 | 1.35 | 28.4 | 0.90 | 24.1 | 0.97 | 14.3 | 0.80 | 6.2 | 0.53 | 1.7 | 0.23 | 0.3 | 0.08 |
| <i>Chinese Taipei</i> | 4.6 | 0.47 | 7.2 | 0.50 | 10.9 | 0.57 | 13.3 | 0.72 | 16.0 | 0.66 | 16.9 | 0.68 | 31.1 | 1.14 |
| <i>Colombia</i> | 45.7 | 1.79 | 29.3 | 0.92 | 16.5 | 1.13 | 6.3 | 0.70 | 1.8 | 0.27 | 0.2 | 0.11 | † | † |
| <i>Costa Rica</i> | 29.9 | 1.75 | 34.9 | 1.04 | 23.4 | 1.22 | 8.5 | 0.91 | 2.5 | 0.58 | 0.6 | 0.23 | † | † |
| <i>Croatia</i> | 11.2 | 0.81 | 23.2 | 0.97 | 28.2 | 0.95 | 20.8 | 0.97 | 10.9 | 0.68 | 4.1 | 0.66 | 1.7 | 0.67 |
| <i>Cyprus</i> | 19.8 | 0.88 | 24.4 | 1.03 | 25.8 | 0.73 | 17.9 | 0.65 | 8.7 | 0.71 | 2.9 | 0.32 | 0.6 | 0.15 |
| Czech Republic | 8.3 | 0.77 | 14.2 | 1.04 | 21.4 | 1.06 | 23.2 | 1.01 | 18.1 | 0.93 | 10.2 | 0.77 | 4.7 | 0.48 |
| Denmark | 5.1 | 0.54 | 13.1 | 0.65 | 24.3 | 0.73 | 29.0 | 0.80 | 18.9 | 0.71 | 7.6 | 0.60 | 1.9 | 0.28 |
| Estonia | 4.3 | 0.44 | 11.6 | 0.79 | 22.0 | 0.87 | 25.9 | 0.99 | 20.1 | 1.13 | 10.8 | 0.80 | 5.2 | 0.48 |
| Finland | 4.7 | 0.44 | 12.0 | 0.59 | 23.1 | 0.69 | 27.1 | 0.75 | 19.5 | 0.65 | 10.0 | 0.50 | 3.8 | 0.35 |
| France | 9.5 | 0.67 | 15.9 | 0.98 | 22.1 | 0.92 | 23.1 | 0.89 | 17.0 | 0.91 | 8.8 | 0.56 | 3.4 | 0.49 |
| Germany | 6.5 | 0.66 | 12.6 | 0.73 | 20.8 | 0.96 | 24.2 | 1.01 | 20.1 | 0.78 | 11.2 | 0.70 | 4.7 | 0.52 |
| Greece | 18.9 | 1.04 | 24.2 | 1.02 | 26.6 | 0.82 | 18.7 | 0.71 | 8.7 | 0.62 | 2.5 | 0.32 | 0.4 | 0.11 |
| <i>Hong Kong-China</i> | 3.2 | 0.47 | 6.4 | 0.65 | 12.2 | 0.80 | 18.1 | 1.13 | 22.6 | 0.97 | 20.3 | 0.86 | 17.1 | 1.23 |
| Hungary | 10.8 | 0.91 | 19.2 | 1.25 | 25.7 | 1.24 | 21.9 | 1.09 | 13.0 | 0.81 | 6.5 | 0.80 | 2.9 | 0.67 |
| Iceland | 7.4 | 0.50 | 14.4 | 0.76 | 24.8 | 0.90 | 26.9 | 0.96 | 17.3 | 0.91 | 7.7 | 0.66 | 1.6 | 0.32 |
| <i>Indonesia</i> | 38.8 | 1.92 | 30.4 | 1.26 | 19.8 | 1.00 | 7.8 | 0.89 | 2.8 | 0.69 | 0.4 | 0.18 | † | † |
| Ireland | 10.2 | 0.79 | 16.5 | 0.66 | 24.7 | 1.03 | 24.5 | 0.99 | 15.7 | 0.73 | 6.5 | 0.46 | 1.8 | 0.27 |
| Israel | 19.4 | 1.39 | 20.1 | 0.93 | 22.4 | 0.84 | 19.5 | 0.85 | 11.8 | 0.86 | 5.1 | 0.54 | 1.6 | 0.34 |
| Italy | 10.7 | 0.46 | 15.9 | 0.50 | 22.4 | 0.57 | 21.7 | 0.65 | 15.7 | 0.51 | 9.0 | 0.45 | 4.6 | 0.37 |
| Japan | 2.3 | 0.40 | 6.1 | 0.58 | 14.4 | 0.90 | 22.4 | 0.94 | 23.1 | 0.90 | 17.9 | 0.86 | 13.8 | 1.14 |
| <i>Jordan</i> | 37.4 | 1.43 | 30.8 | 0.92 | 20.6 | 1.00 | 8.5 | 0.68 | 2.1 | 0.44 | † | † | † | † |
| <i>Kazakhstan</i> | 13.6 | 1.02 | 24.2 | 1.27 | 28.6 | 1.15 | 19.8 | 0.96 | 10.0 | 1.12 | 3.1 | 0.58 | 0.7 | 0.33 |
| Korea, Republic of | 2.8 | 0.46 | 5.9 | 0.54 | 12.7 | 0.81 | 18.6 | 1.03 | 20.9 | 0.90 | 18.5 | 0.89 | 20.6 | 1.62 |
| Latvia | 5.2 | 0.63 | 13.7 | 0.95 | 25.4 | 1.18 | 26.7 | 0.89 | 18.2 | 1.06 | 8.0 | 0.72 | 2.8 | 0.39 |
| <i>Liechtenstein</i> | 3.9 | 1.22 | 7.6 | 1.83 | 16.2 | 2.12 | 23.9 | 2.71 | 21.7 | 2.69 | 16.9 | 2.25 | 9.8 | 2.40 |
| <i>Lithuania</i> | 12.2 | 0.85 | 18.3 | 0.89 | 24.1 | 1.09 | 22.0 | 0.89 | 14.6 | 0.78 | 6.5 | 0.53 | 2.2 | 0.37 |
| Luxembourg | 8.7 | 0.49 | 16.9 | 0.50 | 23.5 | 0.78 | 22.9 | 0.79 | 17.0 | 0.59 | 8.2 | 0.42 | 2.7 | 0.24 |
| <i>Macao-China</i> | 3.7 | 0.28 | 7.0 | 0.35 | 13.8 | 0.60 | 19.9 | 0.76 | 21.8 | 0.67 | 18.2 | 0.59 | 15.6 | 0.56 |
| <i>Malaysia</i> | 19.1 | 1.26 | 26.4 | 1.04 | 26.1 | 0.85 | 17.5 | 0.94 | 8.2 | 0.75 | 2.4 | 0.36 | 0.3 | 0.15 |
| Mexico | 25.0 | 0.72 | 29.4 | 0.51 | 26.2 | 0.49 | 13.7 | 0.50 | 4.6 | 0.25 | 1.0 | 0.10 | 0.1 | 0.02 |
| <i>Montenegro, Republic of</i> | 25.2 | 0.71 | 30.8 | 1.04 | 25.2 | 0.92 | 13.0 | 0.68 | 4.8 | 0.46 | 0.9 | 0.17 | † | † |
| Netherlands | 5.8 | 0.76 | 12.5 | 0.82 | 20.9 | 1.14 | 25.1 | 1.39 | 21.1 | 1.41 | 10.6 | 0.90 | 4.1 | 0.66 |
| New Zealand | 8.5 | 0.73 | 16.3 | 0.78 | 23.4 | 1.00 | 22.8 | 1.06 | 15.8 | 1.07 | 8.6 | 0.94 | 4.4 | 0.44 |
| Norway | 11.1 | 0.79 | 16.5 | 0.73 | 23.4 | 0.69 | 23.0 | 1.06 | 15.4 | 0.85 | 7.5 | 0.51 | 3.2 | 0.42 |
| <i>Peru</i> | 45.4 | 1.87 | 26.5 | 0.98 | 17.0 | 0.95 | 7.5 | 0.71 | 2.7 | 0.46 | 0.8 | 0.26 | † | † |
| Poland | 3.7 | 0.50 | 11.7 | 0.82 | 21.1 | 0.91 | 23.2 | 0.78 | 19.0 | 0.74 | 12.9 | 0.86 | 8.5 | 1.06 |
| Portugal | 11.1 | 0.98 | 15.9 | 0.91 | 20.7 | 0.83 | 20.2 | 1.05 | 17.2 | 0.81 | 10.0 | 0.71 | 5.0 | 0.50 |
| Puerto Rico | 37.0 | 2.17 | 39.4 | 1.73 | 19.2 | 1.60 | 3.9 | 0.87 | † | † | † | † | † | † |
| <i>Qatar</i> | 44.7 | 0.52 | 23.4 | 0.41 | 16.0 | 0.53 | 9.2 | 0.36 | 4.5 | 0.20 | 1.8 | 0.14 | 0.3 | 0.08 |
| <i>Romania</i> | 16.2 | 1.19 | 24.0 | 1.12 | 26.9 | 1.01 | 18.5 | 1.15 | 9.4 | 0.94 | 3.8 | 0.57 | 1.2 | 0.39 |
| <i>Russian Federation</i> | 6.9 | 0.60 | 14.8 | 0.89 | 23.9 | 0.82 | 24.2 | 1.24 | 17.3 | 1.01 | 9.0 | 0.72 | 3.8 | 0.70 |
| <i>Serbia, Republic of</i> | 18.6 | 1.32 | 22.7 | 1.08 | 24.4 | 1.08 | 18.3 | 1.04 | 10.1 | 1.08 | 4.2 | 0.62 | 1.7 | 0.41 |
| <i>Shanghai-China</i> | 0.7 | 0.18 | 2.4 | 0.36 | 5.5 | 0.55 | 9.8 | 0.72 | 14.9 | 0.79 | 20.8 | 0.87 | 45.9 | 1.37 |
| <i>Singapore</i> | 3.2 | 0.30 | 6.4 | 0.36 | 11.2 | 0.48 | 16.7 | 0.59 | 19.7 | 0.63 | 19.4 | 0.90 | 23.4 | 0.74 |
| Slovak Republic | 11.2 | 1.01 | 15.1 | 0.89 | 21.6 | 1.00 | 21.4 | 0.94 | 16.0 | 1.01 | 9.6 | 0.74 | 5.1 | 0.70 |
| Slovenia | 6.5 | 0.45 | 14.0 | 0.70 | 22.8 | 0.96 | 22.8 | 0.97 | 17.9 | 0.79 | 10.7 | 0.62 | 5.2 | 0.42 |
| Spain | 10.1 | 0.52 | 17.7 | 0.65 | 24.7 | 0.75 | 23.4 | 0.80 | 15.6 | 0.54 | 6.6 | 0.36 | 2.0 | 0.16 |
| Sweden | 12.0 | 0.73 | 18.4 | 0.86 | 25.4 | 1.01 | 22.8 | 0.75 | 14.3 | 0.81 | 5.4 | 0.50 | 1.6 | 0.25 |
| Switzerland | 3.5 | 0.44 | 7.9 | 0.64 | 16.0 | 0.76 | 22.3 | 0.79 | 23.1 | 0.76 | 16.1 | 0.80 | 11.1 | 0.86 |
| <i>Thailand</i> | 21.7 | 1.20 | 25.8 | 1.10 | 25.1 | 1.05 | 15.5 | 1.02 | 7.4 | 0.76 | 3.3 | 0.49 | 1.4 | 0.36 |
| <i>Tunisia</i> | 40.8 | 1.84 | 28.4 | 1.19 | 18.9 | 1.01 | 8.2 | 0.67 | 2.6 | 0.59 | 0.8 | 0.35 | † | † |
| Turkey | 22.5 | 1.32 | 23.0 | 1.18 | 21.6 | 1.15 | 14.9 | 1.02 | 9.4 | 0.84 | 5.7 | 0.84 | 2.9 | 0.74 |
| <i>United Arab Emirates</i> | 25.5 | 0.99 | 24.7 | 0.62 | 22.5 | 0.68 | 15.9 | 0.68 | 7.9 | 0.48 | 2.8 | 0.28 | 0.7 | 0.13 |
| United Kingdom | 12.0 | 0.95 | 17.5 | 0.75 | 23.8 | 0.65 | 22.5 | 0.95 | 14.5 | 0.79 | 7.0 | 0.64 | 2.7 | 0.41 |
| United States | 13.5 | 1.02 | 20.9 | 0.98 | 25.0 | 0.87 | 20.6 | 0.91 | 12.4 | 0.84 | 5.4 | 0.54 | 2.2 | 0.36 |
| <i>Uruguay</i> | 28.5 | 1.24 | 25.5 | 1.08 | 22.6 | 0.86 | 14.8 | 0.81 | 6.7 | 0.60 | 1.6 | 0.32 | † | † |
| <i>Vietnam</i> | 6.4 | 0.94 | 12.8 | 1.02 | 21.8 | 1.10 | 24.2 | 1.14 | 18.6 | 0.99 | 10.7 | 0.89 | 5.5 | 0.87 |
| Education systems under the U.S. PISA national center | | | | | | | | | | | | | | |
| <i>Connecticut</i> | 11.6 | 1.55 | 16.7 | 1.31 | 20.4 | 1.42 | 21.1 | 1.48 | 15.8 | 1.21 | 9.6 | 1.19 | 4.7 | 0.83 |
| <i>Florida</i> | 16.4 | 1.90 | 22.5 | 2.02 | 26.5 | 1.38 | 20.5 | 1.62 | 9.6 | 1.07 | 3.9 | 0.88 | † | † |
| <i>Massachusetts</i> | 9.2 | 0.90 | 15.3 | 1.44 | 21.2 | 1.54 | 21.4 | 1.57 | 16.4 | 1.31 | 10.5 | 1.69 | 5.96 | 1.43 |

† Not applicable.

Rounds to zero.

! Interpret data with caution. Estimate is unstable due to high coefficient of variation.

‡ Reporting standards not met.

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into mathematics literacy levels according to their content subscale scores. Exact cut scores are as follows: below level 1 (a score less than or equal to 357.77); level 1 (a score greater than 357.77 and less than or equal to 420.07); level 2 (a score greater than 420.07 and less than or equal to 482.38); level 3 (a score greater than 482.38 and less than or equal to 544.68); level 4 (a score greater than 544.68 and less than or equal to 606.99); level 5 (a score greater than 606.99 and less than or equal to 669.30); and level 6 (a score greater than 669.30). Scores are reported on a scale from 0 to 1,000. The OECD average is the average of the national percentages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national percentages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Detail may not sum to totals because of rounding. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-5. Standard errors for figure 1: Distribution of achievement of 15-year-old students on PISA mathematics literacy scale, by education system: 2012

| Education system | 10th percentile | | 25th percentile | | Average score | | | | 75th percentile | | 90th percentile | | | |
|--|-----------------|------------|-----------------|------------|--|--|------------|------------|-------------------------------|------------|-----------------|------------|-------|------|
| | Score | s.e. | Score | s.e. | Lower 95% confidence interval | | Average | s.e. | Upper 95% confidence interval | | Score | s.e. | Score | s.e. |
| | | | | | Lower 95% confidence interval cutpoint | Upper 95% confidence interval cutpoint | | | | | | | | |
| OECD average | 375 | 0.7 | 430 | 0.6 | 493 | 494 | 0.5 | 495 | 558 | 0.6 | 614 | 0.7 | | |
| Latin America average | 298 | 1.4 | 342 | 1.1 | 395 | 397 | 1.2 | 399 | 449 | 1.4 | 503 | 1.8 | | |
| Shanghai-China | 475 | 5.8 | 546 | 4.4 | 606 | 613 | 3.3 | 619 | 685 | 3.5 | 737 | 3.5 | | |
| Singapore | 432 | 3.6 | 501 | 2.7 | 571 | 573 | 1.3 | 576 | 650 | 1.9 | 707 | 2.3 | | |
| Hong Kong-China | 430 | 6.2 | 499 | 4.7 | 555 | 561 | 3.2 | 568 | 629 | 3.5 | 679 | 4.2 | | |
| Chinese Taipei | 402 | 4.8 | 478 | 4.8 | 553 | 560 | 3.3 | 566 | 645 | 3.4 | 703 | 4.9 | | |
| Korea, Republic of | 425 | 5.8 | 486 | 4.8 | 545 | 554 | 4.6 | 563 | 624 | 5.1 | 679 | 6.0 | | |
| Macao-China | 415 | 2.8 | 476 | 1.7 | 536 | 538 | 1.0 | 540 | 605 | 1.7 | 657 | 2.3 | | |
| Japan | 415 | 5.1 | 473 | 4.2 | 529 | 536 | 3.6 | 544 | 603 | 4.4 | 657 | 5.1 | | |
| Liechtenstein | 403 | 11.2 | 470 | 8.0 | 527 | 535 | 4.0 | 543 | 606 | 5.0 | 656 | 9.2 | | |
| Switzerland | 408 | 3.3 | 466 | 3.4 | 525 | 531 | 3.0 | 537 | 597 | 3.6 | 651 | 4.3 | | |
| Netherlands | 397 | 5.5 | 457 | 5.1 | 516 | 523 | 3.5 | 530 | 591 | 4.3 | 638 | 3.7 | | |
| Estonia | 417 | 3.0 | 465 | 2.7 | 517 | 521 | 2.0 | 525 | 576 | 2.7 | 626 | 3.2 | | |
| Finland | 409 | 3.3 | 463 | 2.5 | 515 | 519 | 1.9 | 523 | 577 | 2.4 | 629 | 3.1 | | |
| Canada | 402 | 2.4 | 457 | 2.1 | 514 | 518 | 1.8 | 522 | 580 | 2.3 | 633 | 2.3 | | |
| Poland | 402 | 2.8 | 454 | 3.3 | 510 | 518 | 3.6 | 525 | 580 | 4.9 | 636 | 6.0 | | |
| Belgium | 378 | 3.9 | 443 | 3.4 | 510 | 515 | 2.1 | 519 | 589 | 2.8 | 646 | 2.5 | | |
| Germany | 385 | 4.7 | 447 | 3.6 | 508 | 514 | 2.9 | 519 | 583 | 3.6 | 637 | 3.8 | | |
| Vietnam | 401 | 7.4 | 454 | 5.3 | 502 | 511 | 4.8 | 521 | 568 | 5.5 | 623 | 6.8 | | |
| Austria | 384 | 3.9 | 440 | 3.2 | 500 | 506 | 2.7 | 511 | 572 | 3.5 | 624 | 3.8 | | |
| Australia | 382 | 2.3 | 437 | 2.0 | 501 | 504 | 1.6 | 507 | 571 | 2.3 | 630 | 3.0 | | |
| Ireland | 391 | 3.6 | 445 | 3.2 | 497 | 501 | 2.2 | 506 | 559 | 2.4 | 610 | 2.5 | | |
| Slovenia | 384 | 2.5 | 434 | 2.0 | 499 | 501 | 1.2 | 504 | 566 | 2.1 | 624 | 2.9 | | |
| Denmark | 393 | 4.0 | 444 | 3.3 | 495 | 500 | 2.3 | 505 | 556 | 2.7 | 607 | 3.1 | | |
| New Zealand | 371 | 3.6 | 428 | 3.2 | 495 | 500 | 2.2 | 504 | 570 | 2.8 | 632 | 3.0 | | |
| Czech Republic | 377 | 4.9 | 432 | 3.9 | 493 | 499 | 2.9 | 505 | 566 | 3.3 | 621 | 3.6 | | |
| France | 365 | 4.7 | 429 | 2.7 | 490 | 495 | 2.5 | 500 | 565 | 3.4 | 621 | 3.5 | | |
| United Kingdom | 371 | 5.0 | 429 | 4.2 | 487 | 494 | 3.3 | 501 | 560 | 3.7 | 616 | 4.1 | | |
| Iceland | 372 | 2.8 | 431 | 2.6 | 489 | 493 | 1.7 | 496 | 557 | 3.0 | 612 | 3.3 | | |
| Latvia | 387 | 4.4 | 434 | 3.3 | 485 | 491 | 2.8 | 496 | 546 | 3.8 | 597 | 3.7 | | |
| Luxembourg | 363 | 3.0 | 422 | 1.5 | 488 | 490 | 1.1 | 492 | 558 | 1.6 | 613 | 2.2 | | |
| Norway | 373 | 3.9 | 428 | 2.9 | 484 | 489 | 2.7 | 495 | 552 | 3.3 | 604 | 3.4 | | |
| Portugal | 363 | 4.2 | 421 | 5.0 | 479 | 487 | 3.8 | 495 | 554 | 4.3 | 610 | 3.9 | | |
| Italy | 366 | 2.2 | 421 | 2.3 | 481 | 485 | 2.0 | 489 | 550 | 2.7 | 607 | 3.0 | | |
| Spain | 370 | 3.1 | 424 | 2.6 | 481 | 484 | 1.9 | 488 | 546 | 2.1 | 597 | 2.4 | | |
| Russian Federation | 371 | 3.9 | 423 | 3.1 | 476 | 482 | 3.0 | 488 | 540 | 3.6 | 595 | 4.7 | | |
| Slovak Republic | 352 | 6.2 | 413 | 4.2 | 475 | 482 | 3.4 | 488 | 553 | 4.7 | 613 | 5.3 | | |
| United States | 368 | 3.9 | 418 | 3.7 | 474 | 481 | 3.6 | 489 | 543 | 4.4 | 600 | 4.3 | | |
| Lithuania | 364 | 3.5 | 418 | 3.1 | 474 | 479 | 2.6 | 484 | 540 | 3.3 | 596 | 3.5 | | |
| Sweden | 360 | 3.5 | 415 | 2.9 | 474 | 478 | 2.3 | 483 | 543 | 2.7 | 596 | 2.9 | | |
| Hungary | 358 | 4.2 | 411 | 3.3 | 471 | 477 | 3.2 | 483 | 540 | 4.8 | 603 | 6.4 | | |
| Croatia | 360 | 3.3 | 408 | 3.6 | 464 | 471 | 3.5 | 478 | 531 | 4.5 | 589 | 7.3 | | |
| Israel | 328 | 5.7 | 393 | 5.1 | 457 | 466 | 4.7 | 476 | 541 | 5.3 | 603 | 6.0 | | |
| Greece | 338 | 3.8 | 393 | 3.6 | 448 | 453 | 2.5 | 458 | 513 | 2.8 | 567 | 3.1 | | |
| Serbia, Republic of | 335 | 4.1 | 386 | 3.7 | 442 | 449 | 3.4 | 456 | 508 | 4.4 | 567 | 5.8 | | |
| Turkey | 339 | 3.3 | 382 | 3.6 | 438 | 448 | 4.8 | 458 | 507 | 8.0 | 577 | 9.7 | | |
| Romania | 344 | 3.5 | 386 | 3.8 | 437 | 445 | 3.8 | 452 | 497 | 4.8 | 553 | 6.1 | | |
| Cyprus | 320 | 2.6 | 376 | 1.6 | 438 | 440 | 1.1 | 442 | 503 | 2.0 | 561 | 2.1 | | |
| Bulgaria | 320 | 4.8 | 372 | 4.7 | 431 | 439 | 4.0 | 447 | 503 | 5.2 | 565 | 5.6 | | |
| United Arab Emirates | 323 | 2.5 | 370 | 2.9 | 429 | 434 | 2.4 | 439 | 494 | 2.9 | 555 | 3.9 | | |
| Kazakhstan | 343 | 2.5 | 383 | 2.8 | 426 | 432 | 3.0 | 438 | 478 | 4.4 | 527 | 5.7 | | |
| Thailand | 328 | 3.1 | 372 | 2.6 | 420 | 427 | 3.4 | 434 | 476 | 4.8 | 535 | 7.3 | | |
| Chile | 323 | 3.7 | 365 | 3.5 | 416 | 423 | 3.1 | 429 | 476 | 4.2 | 532 | 4.2 | | |
| Malaysia | 319 | 3.2 | 363 | 3.1 | 414 | 421 | 3.2 | 427 | 474 | 4.3 | 530 | 4.9 | | |
| Mexico | 320 | 1.9 | 362 | 1.6 | 411 | 413 | 1.4 | 416 | 462 | 1.7 | 510 | 2.0 | | |
| Montenegro, Republic of | 306 | 2.0 | 352 | 1.7 | 408 | 410 | 1.1 | 412 | 465 | 2.0 | 520 | 2.7 | | |
| Uruguay | 297 | 4.1 | 347 | 3.0 | 404 | 409 | 2.8 | 415 | 470 | 3.6 | 526 | 3.8 | | |
| Costa Rica | 323 | 3.8 | 361 | 3.6 | 401 | 407 | 3.0 | 413 | 449 | 3.9 | 496 | 5.1 | | |
| Albania | 278 | 4.8 | 338 | 3.0 | 390 | 394 | 2.0 | 398 | 454 | 2.4 | 510 | 3.5 | | |
| Brazil | 298 | 2.0 | 337 | 1.9 | 387 | 391 | 2.1 | 396 | 440 | 2.7 | 495 | 4.5 | | |
| Argentina | 292 | 4.6 | 337 | 3.8 | 381 | 388 | 3.5 | 395 | 440 | 4.5 | 488 | 4.1 | | |
| Tunisia | 292 | 4.3 | 334 | 3.7 | 380 | 388 | 3.9 | 396 | 437 | 4.5 | 488 | 7.3 | | |
| Jordan | 290 | 4.0 | 335 | 3.2 | 379 | 386 | 3.1 | 392 | 435 | 3.3 | 485 | 4.3 | | |
| Puerto Rico | 304 | 4.1 | 342 | 4.4 | 375 | 382 | 3.6 | 389 | 422 | 4.5 | 461 | 6.8 | | |
| Colombia | 285 | 4.0 | 326 | 2.8 | 371 | 376 | 2.9 | 382 | 423 | 3.6 | 474 | 4.8 | | |
| Qatar | 257 | 1.7 | 306 | 1.3 | 375 | 376 | 0.8 | 378 | 440 | 1.7 | 514 | 1.9 | | |
| Indonesia | 288 | 4.2 | 327 | 3.8 | 367 | 375 | 4.0 | 383 | 418 | 5.2 | 469 | 7.8 | | |
| Peru | 264 | 3.4 | 311 | 3.6 | 361 | 368 | 3.7 | 375 | 421 | 4.9 | 478 | 6.7 | | |
| Education systems under the U.S. PISA national center | | | | | | | | | | | | | | |
| Massachusetts | 387 | 4.8 | 445 | 6.3 | 501 | 514 | 6.2 | 526 | 583 | 9.7 | 643 | 9.4 | | |
| Connecticut | 376 | 7.1 | 435 | 9.0 | 493 | 506 | 6.2 | 518 | 577 | 8.0 | 636 | 8.3 | | |
| Florida | 359 | 7.3 | 406 | 6.2 | 455 | 467 | 5.8 | 478 | 524 | 6.8 | 581 | 8.9 | | |

NOTE: This table shows the threshold (or cut) scores for the following: (a) 10th percentile- the bottom 10 percent of students; (b) 25th percentile- the bottom 25 percent of students; (d) 75th percentile- the top 25 percent of students; (e) 90th percentile- the top 10 percent of students. The percentile ranges are specific to each education system's distribution of scores, enabling users to compare cut scores across education systems. This figure also shows the 95% confidence interval for the average. The lower threshold (or cut) score for the 95% confidence interval for the average is the average score minus 2 standard errors. The upper threshold (or cut) score for the 95% confidence interval for the average is the average score plus 2 standard errors. Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Detail may not sum to totals because of rounding. Scores are reported on a scale from 0 to 1,000. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only. SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-6. Standard errors for figure 2: Difference in average scores of 15-year-old female and male students on PISA mathematics literacy scale, by education system: 2012

| Education system | Female-male difference | s.e. | Education system | Female-male difference | s.e. |
|--------------------------------|------------------------|------|--|------------------------|------------|
| OECD average | -11 | 0.6 | | | |
| Latin America average | -19 | 0.9 | | | |
| <i>Jordan</i> | 21 | 6.3 | Puerto Rico | -11 | 3.0 |
| <i>Qatar</i> | 16 | 1.4 | Belgium | -11 | 3.4 |
| <i>Thailand</i> | 14 | 3.6 | Portugal | -11 | 2.5 |
| <i>Malaysia</i> | 8 | 3.8 | <i>Uruguay</i> | -11 | 3.1 |
| Iceland | 6 | 3.0 | <i>Croatia</i> | -12 | 4.1 |
| <i>United Arab Emirates</i> | 5 | 4.7 | Israel | -12 | 7.6 |
| <i>Latvia</i> | 4 | 3.6 | Czech Republic | -12 | 4.6 |
| <i>Singapore</i> | 3 | 2.5 | Australia | -12 | 3.1 |
| Finland | 3 | 2.9 | United Kingdom | -12 | 4.7 |
| Sweden | 3 | 3.0 | Switzerland | -13 | 2.7 |
| <i>Bulgaria</i> | 2 | 4.1 | Germany | -14 | 2.8 |
| <i>Russian Federation</i> | 2 | 3.0 | <i>Argentina</i> | -14 | 2.9 |
| <i>Albania</i> | 1 | 3.3 | Denmark | -14 | 2.3 |
| <i>Montenegro, Republic of</i> | # | † | Mexico | -14 | 1.2 |
| <i>Lithuania</i> | # | † | New Zealand | -15 | 4.3 |
| <i>Cyprus</i> | # | † | <i>Tunisia</i> | -15 | 2.7 |
| <i>Kazakhstan</i> | # | † | Ireland | -15 | 3.8 |
| Norway | -2 | 3.0 | <i>Hong Kong-China</i> | -15 | 5.7 |
| <i>Macao-China</i> | -3 | 1.9 | Spain | -16 | 2.2 |
| Slovenia | -3 | 3.1 | <i>Brazil</i> | -18 | 1.8 |
| <i>Romania</i> | -4 | 3.6 | Japan | -18 | 4.3 |
| Poland | -4 | 3.4 | Korea, Republic of | -18 | 6.2 |
| <i>Indonesia</i> | -5 | 3.4 | Italy | -18 | 2.5 |
| United States | -5 | 2.8 | <i>Peru</i> | -19 | 3.9 |
| Estonia | -5 | 2.6 | Austria | -22 | 4.9 |
| <i>Chinese Taipei</i> | -5 | 8.9 | <i>Liechtenstein</i> | -23 | 8.8 |
| <i>Shanghai-China</i> | -6 | 3.3 | <i>Costa Rica</i> | -24 | 2.4 |
| Turkey | -8 | 4.7 | Chile | -25 | 3.6 |
| Greece | -8 | 3.2 | Luxembourg | -25 | 2.0 |
| France | -9 | 3.4 | <i>Colombia</i> | -25 | 3.2 |
| Hungary | -9 | 3.7 | | | |
| <i>Serbia, Republic of</i> | -9 | 3.9 | Education systems under the U.S. PISA national center | | |
| Slovak Republic | -9 | 4.5 | <i>Massachusetts</i> | -10 | 4.9 |
| <i>Vietnam</i> | -10 | 3.0 | <i>Florida</i> | -14 | 4.1 |
| Canada | -10 | 2.0 | <i>Connecticut</i> | -14 | 4.4 |
| Netherlands | -10 | 2.8 | | | |

† Not applicable.

Rounds to zero.

NOTE: Education systems are ordered by female-male difference in 2012 average score. Differences were computed using unrounded numbers. Scores are reported on a scale from 0 to 1,000. The OECD average is the average of the national average differences of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national average differences of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-7. Standard errors for table 5: Average scores of 15-year-old students on PISA mathematics literacy scale, by national quarters of the PISA index of economic, social, and cultural status (ESCS) and education system: 2012

| Education system | Average score | | | | | | | | All students | s.e. |
|--|-------------------------------------|------------|----------------|------------|---------------|------------|-------------|------------|--------------|------------|
| | National quarters of the ESCS index | | | | | | | | | |
| | Bottom quarter | s.e. | Second quarter | s.e. | Third quarter | s.e. | Top quarter | s.e. | | |
| OECD average | 452 | 0.7 | 482 | 0.6 | 506 | 0.7 | 542 | 0.8 | 494 | 0.5 |
| Latin America average | 358 | 1.2 | 384 | 1.1 | 404 | 1.2 | 446 | 1.8 | 397 | 1.2 |
| <i>Albania</i> | — | † | — | † | — | † | — | † | 394 | 2.0 |
| <i>Argentina</i> | 355 | 4.1 | 379 | 4.4 | 394 | 4.6 | 433 | 4.3 | 388 | 3.5 |
| <i>Australia</i> | 463 | 2.2 | 492 | 2.0 | 521 | 2.9 | 550 | 2.6 | 504 | 1.6 |
| <i>Austria</i> | 458 | 4.2 | 495 | 4.2 | 519 | 3.8 | 552 | 4.2 | 506 | 2.7 |
| <i>Belgium</i> | 468 | 4.0 | 497 | 3.2 | 534 | 3.0 | 567 | 2.9 | 515 | 2.1 |
| <i>Brazil</i> | 360 | 2.0 | 377 | 2.1 | 395 | 2.9 | 437 | 5.2 | 391 | 2.1 |
| <i>Bulgaria</i> | 384 | 5.1 | 424 | 4.1 | 449 | 6.1 | 501 | 5.9 | 439 | 4.0 |
| <i>Canada</i> | 486 | 2.3 | 509 | 2.5 | 529 | 2.5 | 558 | 2.9 | 518 | 1.8 |
| <i>Chile</i> | 378 | 4.0 | 409 | 3.8 | 429 | 3.6 | 477 | 5.4 | 423 | 3.1 |
| <i>Chinese Taipei</i> | 497 | 5.2 | 546 | 4.5 | 572 | 4.0 | 626 | 5.2 | 560 | 3.3 |
| <i>Colombia</i> | 343 | 4.1 | 365 | 3.7 | 382 | 3.2 | 417 | 5.2 | 376 | 2.9 |
| <i>Costa Rica</i> | 373 | 4.0 | 394 | 3.7 | 412 | 3.8 | 450 | 5.4 | 407 | 3.0 |
| <i>Croatia</i> | 438 | 3.5 | 459 | 3.9 | 471 | 4.9 | 517 | 5.9 | 471 | 3.5 |
| <i>Cyprus</i> | 398 | 2.5 | 428 | 2.5 | 448 | 2.8 | 492 | 2.8 | 440 | 1.1 |
| <i>Czech Republic</i> | 450 | 4.4 | 486 | 4.6 | 508 | 4.3 | 552 | 4.0 | 499 | 2.9 |
| <i>Denmark</i> | 460 | 3.4 | 489 | 3.5 | 513 | 2.9 | 545 | 3.4 | 500 | 2.3 |
| <i>Estonia</i> | 496 | 3.0 | 508 | 3.2 | 523 | 3.6 | 559 | 2.9 | 521 | 2.0 |
| <i>Finland</i> | 488 | 3.1 | 509 | 2.5 | 529 | 3.2 | 555 | 2.6 | 519 | 1.9 |
| <i>France</i> | 442 | 3.5 | 476 | 3.1 | 511 | 4.1 | 561 | 4.0 | 495 | 2.5 |
| <i>Germany</i> | 467 | 5.1 | 502 | 3.9 | 540 | 3.8 | 569 | 4.3 | 514 | 2.9 |
| <i>Greece</i> | 413 | 4.0 | 439 | 3.9 | 460 | 3.5 | 502 | 3.7 | 453 | 2.5 |
| <i>Hong Kong-China</i> | 532 | 4.8 | 554 | 3.7 | 567 | 4.4 | 600 | 5.8 | 561 | 3.2 |
| <i>Hungary</i> | 422 | 4.8 | 464 | 3.6 | 486 | 4.6 | 539 | 6.6 | 477 | 3.2 |
| <i>Iceland</i> | 464 | 2.9 | 481 | 3.1 | 508 | 3.2 | 526 | 3.7 | 493 | 1.7 |
| <i>Indonesia</i> | 356 | 4.3 | 363 | 3.9 | 374 | 4.5 | 408 | 9.7 | 375 | 4.0 |
| <i>Ireland</i> | 462 | 4.3 | 489 | 3.1 | 512 | 2.9 | 545 | 3.3 | 501 | 2.2 |
| <i>Israel</i> | 409 | 5.3 | 452 | 5.6 | 490 | 6.3 | 524 | 5.7 | 466 | 4.7 |
| <i>Italy</i> | 447 | 2.4 | 475 | 2.7 | 498 | 2.6 | 522 | 2.8 | 485 | 2.0 |
| <i>Japan</i> | 500 | 5.2 | 528 | 4.1 | 551 | 4.3 | 575 | 5.9 | 536 | 3.6 |
| <i>Jordan</i> | 361 | 3.0 | 375 | 2.9 | 395 | 3.9 | 419 | 5.8 | 386 | 3.1 |
| <i>Kazakhstan</i> | 405 | 4.0 | 427 | 3.4 | 437 | 3.7 | 458 | 5.2 | 432 | 3.0 |
| <i>Korea, Republic of</i> | 516 | 4.9 | 538 | 4.8 | 567 | 6.2 | 595 | 6.6 | 554 | 4.6 |
| <i>Latvia</i> | 453 | 4.5 | 472 | 3.4 | 508 | 4.6 | 532 | 4.8 | 491 | 2.8 |
| <i>Liechtenstein</i> | 490 | 9.6 | 552 | 11.7 | 542 | 12.0 | 564 | 11.5 | 535 | 4.0 |
| <i>Lithuania</i> | 439 | 3.8 | 465 | 3.6 | 491 | 4.2 | 522 | 3.4 | 479 | 2.6 |
| <i>Luxembourg</i> | 438 | 2.9 | 470 | 2.7 | 508 | 2.5 | 546 | 2.7 | 490 | 1.1 |
| <i>Macao-China</i> | 521 | 2.6 | 535 | 2.6 | 543 | 2.3 | 558 | 2.4 | 538 | 1.0 |
| <i>Malaysia</i> | 388 | 3.1 | 406 | 3.7 | 425 | 4.7 | 465 | 5.4 | 421 | 3.2 |
| <i>Mexico</i> | 385 | 1.9 | 407 | 1.9 | 417 | 1.9 | 447 | 2.4 | 413 | 1.4 |
| <i>Montenegro, Republic of</i> | 375 | 2.0 | 401 | 2.8 | 413 | 2.6 | 453 | 2.8 | 410 | 1.1 |
| <i>Netherlands</i> | 484 | 5.3 | 513 | 3.8 | 537 | 4.8 | 565 | 5.1 | 523 | 3.5 |
| <i>New Zealand</i> | 444 | 3.2 | 493 | 4.0 | 514 | 3.9 | 559 | 3.6 | 500 | 2.2 |
| <i>Norway</i> | 459 | 4.2 | 479 | 3.7 | 504 | 3.9 | 522 | 3.6 | 489 | 2.7 |
| <i>Peru</i> | 317 | 3.3 | 352 | 3.8 | 382 | 5.3 | 421 | 7.4 | 368 | 3.7 |
| <i>Poland</i> | 473 | 3.6 | 501 | 4.2 | 526 | 5.3 | 571 | 6.3 | 518 | 3.6 |
| <i>Portugal</i> | 441 | 4.5 | 474 | 5.0 | 495 | 4.8 | 548 | 5.2 | 487 | 3.8 |
| Puerto Rico | 357 | 3.8 | 372 | 5.2 | 387 | 4.6 | 416 | 7.5 | 382 | 3.6 |
| <i>Qatar</i> | 338 | 1.8 | 377 | 1.8 | 399 | 2.1 | 401 | 2.2 | 376 | 0.8 |
| <i>Romania</i> | 407 | 4.5 | 428 | 3.9 | 444 | 4.0 | 501 | 7.8 | 445 | 3.8 |
| <i>Russian Federation</i> | 445 | 4.9 | 468 | 4.3 | 496 | 3.6 | 521 | 5.1 | 482 | 3.0 |
| <i>Serbia, Republic of</i> | 416 | 4.4 | 436 | 3.8 | 450 | 4.7 | 495 | 5.0 | 449 | 3.4 |
| <i>Shanghai-China</i> | 562 | 6.3 | 602 | 4.8 | 627 | 3.8 | 660 | 5.3 | 613 | 3.3 |
| <i>Singapore</i> | 523 | 2.9 | 557 | 3.3 | 588 | 3.2 | 627 | 2.8 | 573 | 1.3 |
| <i>Slovak Republic</i> | 416 | 6.5 | 473 | 3.7 | 496 | 4.3 | 545 | 6.2 | 482 | 3.4 |
| <i>Slovenia</i> | 458 | 2.6 | 486 | 3.1 | 511 | 3.1 | 552 | 3.2 | 501 | 1.2 |
| <i>Spain</i> | 442 | 2.8 | 471 | 2.4 | 495 | 2.8 | 533 | 2.5 | 484 | 1.9 |
| <i>Sweden</i> | 443 | 2.9 | 470 | 4.0 | 495 | 3.4 | 518 | 3.9 | 478 | 2.3 |
| <i>Switzerland</i> | 488 | 4.0 | 519 | 4.0 | 543 | 3.9 | 576 | 4.6 | 531 | 3.0 |
| <i>Thailand</i> | 407 | 4.7 | 412 | 3.0 | 421 | 3.9 | 468 | 7.1 | 427 | 3.4 |
| <i>Tunisia</i> | 362 | 3.8 | 370 | 4.7 | 393 | 4.1 | 430 | 8.9 | 388 | 3.9 |
| <i>Turkey</i> | 412 | 4.5 | 436 | 4.2 | 447 | 6.0 | 498 | 8.3 | 448 | 4.8 |
| <i>United Arab Emirates</i> | 391 | 3.2 | 427 | 2.4 | 454 | 3.6 | 466 | 4.2 | 434 | 2.4 |
| <i>United Kingdom</i> | 458 | 4.1 | 477 | 4.1 | 508 | 4.1 | 545 | 4.0 | 494 | 3.3 |
| <i>United States</i> | 442 | 3.9 | 462 | 4.6 | 494 | 5.4 | 532 | 4.6 | 481 | 3.6 |
| <i>Uruguay</i> | 364 | 3.3 | 390 | 3.8 | 414 | 4.1 | 472 | 5.5 | 409 | 2.8 |
| <i>Vietnam</i> | 473 | 6.1 | 499 | 4.9 | 518 | 5.8 | 555 | 8.2 | 511 | 4.8 |
| Education systems under the U.S. PISA national center | | | | | | | | | | |
| <i>Connecticut</i> | 450 | 6.1 | 482 | 6.5 | 529 | 5.6 | 570 | 5.6 | 506 | 6.2 |
| <i>Florida</i> | 430 | 4.8 | 455 | 6.7 | 465 | 7.0 | 521 | 7.1 | 467 | 5.8 |
| <i>Massachusetts</i> | 459 | 6.0 | 491 | 5.3 | 533 | 6.6 | 576 | 8.8 | 514 | 6.2 |

— Not available.

† Not applicable.

NOTE: The PISA index of economic, social and cultural status (ESCS) was created using student reports on parental occupation, the highest level of parental education, and an index of home possessions related to family wealth, home educational resources and possessions related to “classical” culture in the family home. The home possessions relating to “classical” culture in the family home included possessions such as works of classical literature, books of poetry, and works of art (e.g. paintings). The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-8. Standard errors for table 6: Average scores of 15-year-old students on PISA science literacy scale, by education system: 2012

| Education system | Average score | s.e. | Education system | Average score | s.e. |
|------------------------|---------------|------|--------------------------------------|---------------|------------|
| OECD average | 501 | 0.5 | | | |
| Latin America average | 411 | 1.2 | | | |
| <i>Shanghai-China</i> | 580 | 3.0 | <i>Russian Federation</i> | 486 | 2.9 |
| <i>Hong Kong-China</i> | 555 | 2.6 | Sweden | 485 | 3.0 |
| <i>Singapore</i> | 551 | 1.5 | Iceland | 478 | 2.1 |
| Japan | 547 | 3.6 | Slovak Republic | 471 | 3.6 |
| Finland | 545 | 2.2 | Israel | 470 | 5.0 |
| Estonia | 541 | 1.9 | Greece | 467 | 3.1 |
| Korea, Republic of | 538 | 3.7 | Turkey | 463 | 3.9 |
| <i>Vietnam</i> | 528 | 4.3 | <i>United Arab Emirates</i> | 448 | 2.8 |
| Poland | 526 | 3.1 | <i>Bulgaria</i> | 446 | 4.8 |
| Canada | 525 | 1.9 | Chile | 445 | 2.9 |
| <i>Liechtenstein</i> | 525 | 3.5 | <i>Serbia, Republic of</i> | 445 | 3.4 |
| Germany | 524 | 3.0 | <i>Thailand</i> | 444 | 2.9 |
| <i>Chinese Taipei</i> | 523 | 2.3 | <i>Romania</i> | 439 | 3.3 |
| Netherlands | 522 | 3.5 | <i>Cyprus</i> | 438 | 1.2 |
| Ireland | 522 | 2.5 | <i>Costa Rica</i> | 429 | 2.9 |
| Australia | 521 | 1.8 | <i>Kazakhstan</i> | 425 | 3.0 |
| <i>Macao-China</i> | 521 | 0.8 | <i>Malaysia</i> | 420 | 3.0 |
| New Zealand | 516 | 2.1 | <i>Uruguay</i> | 416 | 2.8 |
| Switzerland | 515 | 2.7 | Mexico | 415 | 1.3 |
| Slovenia | 514 | 1.3 | <i>Montenegro, Republic of</i> | 410 | 1.1 |
| United Kingdom | 514 | 3.4 | <i>Jordan</i> | 409 | 3.1 |
| Czech Republic | 508 | 3.0 | <i>Argentina</i> | 406 | 3.9 |
| Austria | 506 | 2.7 | <i>Brazil</i> | 405 | 2.1 |
| Belgium | 505 | 2.2 | Puerto Rico | 401 | 5.1 |
| <i>Latvia</i> | 502 | 2.8 | <i>Colombia</i> | 399 | 3.1 |
| France | 499 | 2.6 | <i>Tunisia</i> | 398 | 3.5 |
| Denmark | 498 | 2.7 | <i>Albania</i> | 397 | 2.4 |
| United States | 497 | 3.8 | <i>Qatar</i> | 384 | 0.7 |
| Spain | 496 | 1.8 | <i>Indonesia</i> | 382 | 3.8 |
| <i>Lithuania</i> | 496 | 2.6 | <i>Peru</i> | 373 | 3.6 |
| Norway | 495 | 3.1 | | | |
| Hungary | 494 | 2.9 | Education systems under | | |
| Italy | 494 | 1.9 | the U.S. PISA national center | | |
| <i>Croatia</i> | 491 | 3.1 | <i>Massachusetts</i> | 527 | 6.0 |
| Luxembourg | 491 | 1.3 | <i>Connecticut</i> | 521 | 5.7 |
| Portugal | 489 | 3.7 | <i>Florida</i> | 485 | 6.4 |

NOTE: Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Scores are reported on a scale from 0 to 1,000. Standard error is noted by s.e. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only. SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-9. Standard errors for table 7. Percentage distribution of 15-year-old students on PISA science literacy scale, by proficiency level and education system: 2012

| Education system | Below level 1 | | Level 1 | | Level 2 | | Level 3 | | Level 4 | | Level 5 | | Level 6 | |
|--|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|----------|----------|----------|----------|
| | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. |
| OECD average | 4.8 | 0.09 | 13.0 | 0.14 | 24.5 | 0.16 | 28.8 | 0.17 | 20.5 | 0.15 | 7.2 | 0.10 | 1.1 | 0.04 |
| Latin America average | 17.3 | 0.39 | 32.3 | 0.38 | 32.0 | 0.35 | 14.6 | 0.33 | 3.4 | 0.16 | 0.4 | 0.05 | ‡ | † |
| Albania | 23.5 | 1.04 | 29.6 | 0.94 | 28.5 | 1.19 | 14.4 | 0.78 | 3.6 | 0.41 | 0.4 | 0.14 | ‡ | † |
| Argentina | 19.8 | 1.39 | 31.0 | 1.46 | 31.1 | 1.33 | 14.8 | 1.20 | 3.0 | 0.43 | 0.2 | 0.10 | ‡ | † |
| Australia | 3.4 | 0.25 | 10.2 | 0.41 | 21.5 | 0.47 | 28.5 | 0.68 | 22.8 | 0.63 | 10.9 | 0.47 | 2.6 | 0.25 |
| Austria | 3.6 | 0.54 | 12.2 | 0.92 | 24.3 | 1.05 | 30.1 | 0.85 | 21.9 | 0.81 | 7.0 | 0.62 | 0.8 | 0.20 |
| Belgium | 5.9 | 0.53 | 11.8 | 0.58 | 21.5 | 0.63 | 28.7 | 0.71 | 23.0 | 0.66 | 8.1 | 0.42 | 0.9 | 0.16 |
| Brazil | 18.6 | 0.78 | 35.1 | 0.79 | 30.7 | 0.78 | 12.5 | 0.68 | 2.8 | 0.37 | 0.3 | 0.10 | ‡ | † |
| Bulgaria | 14.4 | 1.34 | 22.5 | 1.15 | 26.3 | 1.07 | 22.5 | 1.09 | 11.2 | 0.84 | 2.8 | 0.50 | 0.3 | 0.12 |
| Canada | 2.4 | 0.24 | 8.0 | 0.38 | 21.0 | 0.65 | 32.0 | 0.54 | 25.3 | 0.58 | 9.5 | 0.47 | 1.8 | 0.20 |
| Chile | 8.1 | 0.80 | 26.3 | 1.11 | 34.6 | 1.06 | 22.4 | 0.96 | 7.5 | 0.60 | 1.0 | 0.15 | ‡ | † |
| Chinese Taipei | 1.6 | 0.25 | 8.2 | 0.64 | 20.8 | 0.89 | 33.7 | 0.97 | 27.3 | 1.00 | 7.8 | 0.56 | 0.6 | 0.13 |
| Colombia | 19.8 | 1.36 | 36.3 | 1.10 | 30.8 | 1.08 | 11.0 | 0.83 | 1.9 | 0.25 | ‡ | † | ‡ | † |
| Costa Rica | 8.6 | 0.79 | 30.7 | 1.30 | 39.2 | 1.25 | 17.8 | 1.12 | 3.4 | 0.57 | 0.2 | 0.11 | ‡ | † |
| Croatia | 3.2 | 0.38 | 14.0 | 0.74 | 29.1 | 0.99 | 31.4 | 1.19 | 17.6 | 1.16 | 4.3 | 0.75 | ‡ | † |
| Cyprus | 14.4 | 0.47 | 23.7 | 0.66 | 30.3 | 0.89 | 21.3 | 0.73 | 8.4 | 0.43 | 1.8 | 0.29 | 0.2 | 0.08 |
| Czech Republic | 3.3 | 0.62 | 10.5 | 1.03 | 24.7 | 0.99 | 31.7 | 1.23 | 22.2 | 0.96 | 6.7 | 0.53 | 0.9 | 0.18 |
| Denmark | 4.7 | 0.55 | 12.0 | 0.69 | 25.7 | 0.80 | 31.3 | 0.90 | 19.6 | 0.79 | 6.1 | 0.67 | 0.7 | 0.17 |
| Estonia | 0.5 | 0.14 | 4.5 | 0.43 | 19.0 | 0.87 | 34.5 | 0.87 | 28.7 | 0.96 | 11.1 | 0.66 | 1.7 | 0.25 |
| Finland | 1.8 | 0.28 | 5.9 | 0.48 | 16.8 | 0.69 | 29.6 | 0.77 | 28.8 | 0.73 | 13.9 | 0.62 | 3.2 | 0.38 |
| France | 6.1 | 0.67 | 12.6 | 0.71 | 22.9 | 1.08 | 29.2 | 1.12 | 21.3 | 0.87 | 6.9 | 0.68 | 1.0 | 0.21 |
| Germany | 2.9 | 0.46 | 9.3 | 0.73 | 20.5 | 0.82 | 28.9 | 0.89 | 26.2 | 1.05 | 10.6 | 0.80 | 1.6 | 0.28 |
| Greece | 7.4 | 0.70 | 18.1 | 1.14 | 31.0 | 1.10 | 28.8 | 1.02 | 12.2 | 0.81 | 2.3 | 0.40 | ‡ | † |
| Hong Kong-China | 1.2 | 0.23 | 4.4 | 0.52 | 13.0 | 0.72 | 29.8 | 1.06 | 34.9 | 0.99 | 14.9 | 0.91 | 1.8 | 0.36 |
| Hungary | 4.1 | 0.61 | 14.0 | 1.04 | 26.4 | 1.08 | 30.9 | 1.16 | 18.7 | 0.98 | 5.5 | 0.73 | 0.5 | 0.18 |
| Iceland | 8.0 | 0.56 | 16.0 | 0.72 | 27.5 | 0.87 | 27.2 | 0.86 | 16.2 | 0.74 | 4.6 | 0.60 | 0.6 | 0.17 |
| Indonesia | 24.7 | 1.96 | 41.9 | 1.42 | 26.3 | 1.54 | 6.5 | 1.02 | ‡ | † | ‡ | † | ‡ | † |
| Ireland | 2.6 | 0.40 | 8.5 | 0.76 | 22.0 | 1.15 | 31.1 | 1.03 | 25.0 | 0.94 | 9.3 | 0.63 | 1.5 | 0.25 |
| Israel | 11.2 | 1.08 | 17.7 | 0.93 | 24.8 | 0.93 | 24.4 | 1.19 | 16.1 | 1.12 | 5.2 | 0.58 | 0.6 | 0.22 |
| Italy | 4.9 | 0.35 | 13.8 | 0.52 | 26.0 | 0.58 | 30.1 | 0.66 | 19.1 | 0.59 | 5.5 | 0.37 | 0.6 | 0.08 |
| Japan | 2.0 | 0.39 | 6.4 | 0.61 | 16.3 | 0.79 | 27.5 | 0.92 | 29.5 | 1.06 | 14.8 | 0.93 | 3.4 | 0.49 |
| Jordan | 18.2 | 1.21 | 31.4 | 0.96 | 32.2 | 1.04 | 15.0 | 0.86 | 3.0 | 0.57 | ‡ | † | ‡ | † |
| Kazakhstan | 11.3 | 0.99 | 30.7 | 1.49 | 36.8 | 1.16 | 17.8 | 1.19 | 3.3 | 0.45 | 0.2 | 0.09 | ‡ | † |
| Korea, Republic of | 1.2 | 0.25 | 5.5 | 0.60 | 18.0 | 1.02 | 33.6 | 1.11 | 30.1 | 1.24 | 10.6 | 0.93 | 1.1 | 0.39 |
| Latvia | 1.8 | 0.39 | 10.5 | 0.90 | 28.2 | 1.20 | 35.1 | 1.02 | 20.0 | 1.05 | 4.0 | 0.47 | 0.3 | 0.13 |
| Liechtenstein | ‡ | † | 9.6 | 1.94 | 22.0 | 3.94 | 30.8 | 3.79 | 26.7 | 2.58 | 9.1 | 1.47 | ‡ | † |
| Lithuania | 3.4 | 0.48 | 12.7 | 0.84 | 27.6 | 1.00 | 32.9 | 1.08 | 18.3 | 0.88 | 4.7 | 0.47 | 0.4 | 0.09 |
| Luxembourg | 7.2 | 0.42 | 15.1 | 0.67 | 24.2 | 0.63 | 26.2 | 0.60 | 19.2 | 0.53 | 7.0 | 0.49 | 1.2 | 0.17 |
| Macao-China | 1.4 | 0.20 | 7.4 | 0.49 | 22.2 | 0.60 | 36.2 | 0.81 | 26.2 | 0.73 | 6.2 | 0.35 | 0.4 | 0.10 |
| Malaysia | 14.5 | 1.13 | 31.0 | 1.21 | 33.9 | 1.10 | 16.5 | 1.07 | 3.7 | 0.54 | 0.3 | 0.13 | ‡ | † |
| Mexico | 12.6 | 0.52 | 34.4 | 0.58 | 37.0 | 0.59 | 13.8 | 0.52 | 2.1 | 0.16 | 0.1 | 0.04 | ‡ | † |
| Montenegro, Republic of | 18.7 | 0.74 | 32.0 | 0.98 | 29.7 | 0.94 | 15.4 | 0.76 | 3.8 | 0.47 | 0.4 | 0.14 | ‡ | † |
| Netherlands | 3.1 | 0.53 | 10.1 | 0.83 | 20.1 | 1.35 | 29.1 | 1.28 | 25.8 | 1.24 | 10.5 | 0.98 | 1.3 | 0.28 |
| New Zealand | 4.7 | 0.39 | 11.6 | 0.76 | 21.7 | 0.94 | 26.4 | 0.95 | 22.3 | 0.85 | 10.7 | 0.62 | 2.7 | 0.25 |
| Norway | 6.0 | 0.63 | 13.6 | 0.71 | 24.8 | 0.80 | 28.9 | 0.91 | 19.0 | 0.79 | 6.4 | 0.56 | 1.1 | 0.24 |
| Peru | 31.5 | 1.61 | 37.0 | 1.26 | 23.5 | 1.29 | 7.0 | 0.85 | 1.0 | 0.28 | ‡ | † | ‡ | † |
| Poland | 1.3 | 0.32 | 7.7 | 0.70 | 22.5 | 0.98 | 33.1 | 0.92 | 24.5 | 0.96 | 9.1 | 0.76 | 1.7 | 0.35 |
| Portugal | 4.7 | 0.66 | 14.3 | 1.09 | 27.3 | 0.96 | 31.4 | 1.25 | 17.8 | 1.06 | 4.2 | 0.55 | 0.3 | 0.11 |
| Puerto Rico | 19.4 | 2.30 | 36.1 | 1.94 | 29.8 | 2.10 | 12.4 | 1.52 | 2.1 | 0.69 | ‡ | † | ‡ | † |
| Qatar | 34.6 | 0.38 | 28.0 | 0.58 | 19.6 | 0.71 | 11.2 | 0.39 | 5.1 | 0.40 | 1.3 | 0.11 | 0.1 | 0.04 |
| Romania | 8.7 | 0.77 | 28.7 | 1.32 | 34.6 | 1.23 | 21.0 | 1.12 | 6.2 | 0.77 | 0.9 | 0.26 | ‡ | † |
| Russian Federation | 3.6 | 0.39 | 15.1 | 0.96 | 30.1 | 1.08 | 31.2 | 0.89 | 15.7 | 0.98 | 3.9 | 0.51 | 0.3 | 0.16 |
| Serbia, Republic of | 10.3 | 0.99 | 24.7 | 1.15 | 32.4 | 1.21 | 22.8 | 1.06 | 8.1 | 0.63 | 1.6 | 0.35 | ‡ | † |
| Shanghai-China | 0.3 | 0.11 | 2.4 | 0.36 | 10.0 | 0.86 | 24.6 | 0.87 | 35.5 | 1.11 | 23.0 | 1.09 | 4.2 | 0.57 |
| Singapore | 2.2 | 0.27 | 7.4 | 0.48 | 16.7 | 0.73 | 24.0 | 0.73 | 27.0 | 0.87 | 16.9 | 0.94 | 5.8 | 0.41 |
| Slovak Republic | 9.2 | 0.95 | 17.6 | 1.14 | 27.0 | 1.30 | 26.2 | 1.62 | 15.0 | 1.02 | 4.3 | 0.58 | 0.6 | 0.25 |
| Slovenia | 2.4 | 0.19 | 10.4 | 0.55 | 24.5 | 1.00 | 30.0 | 1.02 | 23.0 | 0.92 | 8.4 | 0.71 | 1.2 | 0.24 |
| Spain | 3.7 | 0.33 | 12.0 | 0.51 | 27.3 | 0.64 | 32.8 | 0.60 | 19.4 | 0.53 | 4.5 | 0.26 | 0.3 | 0.08 |
| Sweden | 7.3 | 0.62 | 15.0 | 0.80 | 26.2 | 0.84 | 28.0 | 0.84 | 17.2 | 0.77 | 5.6 | 0.45 | 0.7 | 0.14 |
| Switzerland | 3.0 | 0.31 | 9.8 | 0.62 | 22.8 | 0.82 | 31.3 | 0.74 | 23.7 | 0.86 | 8.3 | 0.70 | 1.0 | 0.22 |
| Thailand | 7.0 | 0.64 | 26.6 | 1.33 | 37.5 | 1.07 | 21.6 | 1.14 | 6.4 | 0.74 | 0.9 | 0.27 | ‡ | † |
| Tunisia | 21.3 | 1.45 | 34.0 | 1.07 | 31.1 | 1.36 | 11.7 | 1.00 | 1.8 | 0.49 | ‡ | † | ‡ | † |
| Turkey | 4.4 | 0.50 | 21.9 | 1.27 | 35.4 | 1.43 | 25.1 | 1.28 | 11.3 | 1.28 | 1.8 | 0.34 | ‡ | † |
| United Arab Emirates | 11.3 | 0.76 | 23.8 | 0.99 | 29.9 | 0.83 | 22.3 | 0.88 | 10.1 | 0.60 | 2.3 | 0.25 | 0.3 | 0.07 |
| United Kingdom | 4.3 | 0.48 | 10.7 | 0.86 | 22.4 | 1.00 | 28.4 | 0.98 | 23.0 | 0.91 | 9.3 | 0.70 | 1.8 | 0.34 |
| United States | 4.2 | 0.54 | 14.0 | 1.08 | 26.7 | 1.08 | 28.9 | 1.07 | 18.8 | 1.07 | 6.3 | 0.64 | 1.1 | 0.20 |
| Uruguay | 19.7 | 1.06 | 27.2 | 0.92 | 29.3 | 1.00 | 17.1 | 0.95 | 5.6 | 0.53 | 1.0 | 0.24 | ‡ | † |
| Vietnam | 0.9 | 0.26 | 5.8 | 0.90 | 20.7 | 1.40 | 37.5 | 1.48 | 27.0 | 1.50 | 7.1 | 0.90 | 1.0 | 0.32 |
| Education systems under the U.S. PISA national center | | | | | | | | | | | | | | |
| Connecticut | 3.3 | 0.82 | 10.2 | 1.36 | 21.4 | 1.58 | 29.4 | 1.69 | 22.8 | 1.46 | 10.7 | 1.13 | 2.2 | 0.60 |
| Florida | 5.1 | 0.96 | 16.1 | 1.61 | 28.4 | 1.61 | 28.2 | 2.00 | 16.6 | 1.64 | 4.9 | 1.01 | ‡ | † |
| Massachusetts | 2.6 | 0.65 | 8.9 | 1.03 | 21.2 | 1.96 | 29.4 | 1.50 | 23.8 | 1.84 | 11.3 | 1.48 | 2.9 | 0.73 |

† Not applicable.

Rounds to zero.

! Interpret data with caution. Estimate is unstable due to high coefficient of variation.

‡ Reporting standards not met.

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into science literacy levels according to their scores. Exact cut scores are as follows: below level 1 (a score less than or equal to 334.94); level 1 (a score greater than 334.94 and less than or equal to 409.54); level 2 (a score greater than 409.54 and less than or equal to 484.14); level 3 (a score greater than 484.14 and less than or equal to 558.73); level 4 (a score greater than 558.73 and less than or equal to 633.33); level 5 (a score greater than 633.33 and less than or equal to 707.93); and level 6 (a score greater than 707.93). Scores are reported on a scale from 0 to 1,000. The OECD average is the average of the national percentages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national percentages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Detail may not sum to totals because of rounding. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-10. Standard errors for figure 3: Distribution of achievement of 15-year-old students on PISA science literacy scale, by education system: 2012

| Education system | 10th percentile | | 25th percentile | | Average score | | | | 75th percentile | | 90th percentile | |
|--|-----------------|------------|-----------------|------------|--|------------|------------|--|-----------------|------------|-----------------|------------|
| | Score | s.e. | Score | s.e. | Lower 95% confidence interval cutpoint | Average | s.e. | Upper 95% confidence interval cutpoint | Score | s.e. | Score | s.e. |
| OECD average | 380 | 0.8 | 439 | 0.6 | 500 | 501 | 0.5 | 502 | 566 | 0.6 | 619 | 0.6 |
| Latin America average | 307 | 1.3 | 356 | 1.3 | 409 | 411 | 1.2 | 413 | 465 | 1.4 | 516 | 1.6 |
| Shanghai-China | 472 | 5.4 | 527 | 3.7 | 574 | 580 | 3.0 | 586 | 639 | 3.2 | 681 | 3.2 |
| Hong Kong-China | 446 | 5.1 | 505 | 3.8 | 550 | 555 | 2.6 | 560 | 613 | 3.0 | 655 | 3.4 |
| Singapore | 412 | 3.2 | 480 | 2.6 | 548 | 551 | 1.5 | 555 | 627 | 2.6 | 681 | 3.4 |
| Japan | 421 | 6.4 | 485 | 4.5 | 540 | 547 | 3.6 | 554 | 614 | 3.6 | 664 | 4.3 |
| Finland | 424 | 3.9 | 486 | 2.8 | 541 | 545 | 2.2 | 550 | 609 | 2.4 | 662 | 2.9 |
| Estonia | 439 | 3.3 | 487 | 2.7 | 538 | 541 | 1.9 | 545 | 597 | 2.6 | 645 | 3.1 |
| Korea, Republic of | 431 | 4.9 | 485 | 4.0 | 530 | 538 | 3.7 | 545 | 595 | 4.1 | 639 | 4.3 |
| Vietnam | 428 | 7.0 | 478 | 5.2 | 520 | 528 | 4.3 | 537 | 580 | 4.0 | 625 | 5.5 |
| Poland | 415 | 4.0 | 467 | 3.3 | 520 | 526 | 3.1 | 532 | 584 | 4.0 | 637 | 5.0 |
| Canada | 407 | 2.7 | 467 | 2.1 | 522 | 525 | 1.9 | 529 | 588 | 2.4 | 639 | 2.6 |
| Liechtenstein | 408 | 10.0 | 464 | 8.4 | 518 | 525 | 3.5 | 532 | 588 | 8.2 | 635 | 9.3 |
| Germany | 397 | 4.8 | 461 | 3.8 | 518 | 524 | 3.0 | 530 | 592 | 3.1 | 642 | 3.9 |
| Chinese Taipei | 411 | 4.3 | 469 | 3.8 | 519 | 523 | 2.3 | 528 | 582 | 2.4 | 626 | 2.2 |
| Netherlands | 393 | 5.4 | 458 | 5.0 | 515 | 522 | 3.5 | 529 | 591 | 3.9 | 641 | 4.1 |
| Ireland | 404 | 4.8 | 462 | 3.1 | 517 | 522 | 2.5 | 527 | 586 | 2.4 | 637 | 2.6 |
| Australia | 391 | 2.6 | 453 | 2.1 | 518 | 521 | 1.8 | 525 | 592 | 2.5 | 650 | 2.7 |
| Macao-China | 416 | 2.7 | 469 | 1.9 | 519 | 521 | 0.8 | 522 | 575 | 1.7 | 619 | 1.8 |
| New Zealand | 377 | 4.5 | 444 | 3.0 | 511 | 516 | 2.1 | 520 | 591 | 3.1 | 649 | 3.0 |
| Switzerland | 394 | 3.4 | 455 | 3.8 | 510 | 515 | 2.7 | 521 | 579 | 3.1 | 630 | 3.3 |
| Slovenia | 397 | 3.5 | 451 | 2.2 | 512 | 514 | 1.3 | 517 | 578 | 2.0 | 631 | 3.2 |
| United Kingdom | 384 | 4.9 | 448 | 4.6 | 507 | 514 | 3.4 | 521 | 584 | 3.5 | 639 | 3.9 |
| Czech Republic | 392 | 5.5 | 449 | 4.0 | 502 | 508 | 3.0 | 514 | 572 | 3.2 | 622 | 3.7 |
| Austria | 383 | 5.3 | 442 | 3.5 | 500 | 506 | 2.7 | 511 | 571 | 3.1 | 623 | 3.4 |
| Belgium | 368 | 4.5 | 439 | 3.3 | 501 | 505 | 2.2 | 509 | 577 | 2.5 | 629 | 2.0 |
| Latvia | 400 | 4.5 | 449 | 3.2 | 497 | 502 | 2.8 | 508 | 557 | 3.6 | 603 | 3.2 |
| France | 366 | 6.0 | 433 | 3.4 | 494 | 499 | 2.6 | 504 | 570 | 3.0 | 622 | 4.1 |
| Denmark | 378 | 4.3 | 438 | 3.8 | 493 | 498 | 2.7 | 504 | 563 | 3.2 | 615 | 4.1 |
| United States | 377 | 4.9 | 431 | 4.4 | 490 | 497 | 3.8 | 505 | 563 | 4.2 | 619 | 4.5 |
| Spain | 384 | 3.1 | 440 | 2.3 | 493 | 496 | 1.8 | 500 | 557 | 1.8 | 605 | 2.0 |
| Lithuania | 383 | 4.0 | 438 | 3.2 | 491 | 496 | 2.6 | 501 | 555 | 3.0 | 605 | 3.6 |
| Norway | 365 | 5.2 | 429 | 3.7 | 488 | 495 | 3.1 | 501 | 564 | 3.3 | 620 | 3.4 |
| Hungary | 376 | 4.6 | 432 | 4.3 | 488 | 494 | 2.9 | 500 | 558 | 3.5 | 610 | 4.7 |
| Italy | 371 | 2.8 | 431 | 2.5 | 490 | 494 | 1.9 | 497 | 559 | 2.0 | 611 | 2.5 |
| Croatia | 380 | 4.0 | 433 | 3.3 | 485 | 491 | 3.1 | 498 | 551 | 4.2 | 602 | 5.2 |
| Luxembourg | 355 | 3.1 | 419 | 2.2 | 489 | 491 | 1.3 | 494 | 566 | 1.9 | 624 | 2.9 |
| Portugal | 372 | 5.6 | 430 | 4.8 | 482 | 489 | 3.7 | 497 | 551 | 3.6 | 602 | 3.6 |
| Russian Federation | 377 | 4.1 | 428 | 3.6 | 481 | 486 | 2.9 | 492 | 544 | 3.3 | 596 | 4.9 |
| Sweden | 354 | 4.7 | 419 | 4.1 | 479 | 485 | 3.0 | 491 | 554 | 3.2 | 611 | 3.4 |
| Iceland | 348 | 3.4 | 413 | 2.5 | 474 | 478 | 2.1 | 482 | 548 | 3.2 | 603 | 3.7 |
| Slovak Republic | 339 | 5.7 | 403 | 5.2 | 464 | 471 | 3.6 | 478 | 542 | 4.0 | 599 | 4.9 |
| Israel | 328 | 6.4 | 396 | 5.7 | 460 | 470 | 5.0 | 480 | 548 | 5.7 | 608 | 5.4 |
| Greece | 352 | 5.1 | 408 | 4.5 | 460 | 467 | 3.1 | 473 | 528 | 3.5 | 578 | 3.6 |
| Turkey | 363 | 3.5 | 407 | 3.5 | 456 | 463 | 3.9 | 471 | 518 | 5.8 | 573 | 6.3 |
| United Arab Emirates | 328 | 3.2 | 382 | 3.5 | 443 | 448 | 2.8 | 454 | 512 | 3.5 | 572 | 3.4 |
| Bulgaria | 315 | 5.3 | 374 | 5.6 | 437 | 446 | 4.8 | 456 | 519 | 5.1 | 580 | 6.1 |
| Chile | 343 | 3.8 | 388 | 3.3 | 439 | 445 | 2.9 | 451 | 500 | 3.6 | 552 | 3.7 |
| Serbia, Republic of | 333 | 5.2 | 385 | 4.5 | 438 | 445 | 3.4 | 452 | 504 | 3.5 | 558 | 3.9 |
| Thailand | 349 | 3.4 | 392 | 2.6 | 438 | 444 | 2.9 | 450 | 494 | 3.8 | 544 | 5.4 |
| Romania | 340 | 3.2 | 383 | 3.4 | 432 | 439 | 3.3 | 445 | 492 | 4.6 | 543 | 5.1 |
| Cyprus | 313 | 2.9 | 373 | 2.0 | 435 | 438 | 1.2 | 440 | 503 | 2.4 | 561 | 2.5 |
| Costa Rica | 341 | 3.3 | 382 | 3.6 | 423 | 429 | 2.9 | 435 | 476 | 3.6 | 520 | 4.9 |
| Kazakhstan | 330 | 3.6 | 375 | 3.4 | 419 | 425 | 3.0 | 431 | 475 | 3.5 | 521 | 3.8 |
| Malaysia | 319 | 3.4 | 365 | 3.4 | 414 | 420 | 3.0 | 425 | 473 | 3.6 | 521 | 4.3 |
| Uruguay | 293 | 4.2 | 352 | 3.8 | 410 | 416 | 2.8 | 421 | 480 | 3.4 | 538 | 4.3 |
| Mexico | 325 | 2.1 | 368 | 1.6 | 412 | 415 | 1.3 | 418 | 462 | 1.5 | 505 | 1.9 |
| Montenegro, Republic of | 302 | 2.9 | 352 | 1.4 | 408 | 410 | 1.1 | 412 | 468 | 2.2 | 522 | 2.3 |
| Jordan | 303 | 4.4 | 355 | 3.6 | 403 | 409 | 3.1 | 416 | 466 | 3.4 | 514 | 4.2 |
| Argentina | 297 | 5.1 | 350 | 4.6 | 398 | 406 | 3.9 | 413 | 464 | 4.7 | 513 | 4.7 |
| Brazil | 306 | 2.3 | 351 | 2.0 | 400 | 405 | 2.1 | 409 | 456 | 2.8 | 507 | 3.7 |
| Puerto Rico | 303 | 6.8 | 349 | 5.6 | 391 | 401 | 5.1 | 411 | 452 | 6.1 | 504 | 6.9 |
| Colombia | 302 | 4.6 | 347 | 3.4 | 393 | 399 | 3.1 | 405 | 449 | 3.5 | 497 | 4.0 |
| Tunisia | 296 | 4.6 | 345 | 4.1 | 391 | 398 | 3.5 | 405 | 452 | 4.1 | 497 | 5.1 |
| Albania | 271 | 5.2 | 340 | 3.5 | 392 | 397 | 2.4 | 402 | 464 | 3.0 | 517 | 3.3 |
| Qatar | 254 | 1.4 | 309 | 1.3 | 382 | 384 | 0.7 | 385 | 453 | 1.6 | 530 | 2.4 |
| Indonesia | 297 | 4.9 | 336 | 3.8 | 374 | 382 | 3.8 | 390 | 427 | 4.7 | 471 | 6.0 |
| Peru | 275 | 3.8 | 321 | 3.4 | 366 | 373 | 3.6 | 380 | 425 | 4.4 | 475 | 5.4 |
| Education systems under the U.S. PISA national center | | | | | | | | | | | | |
| Massachusetts | 403 | 5.6 | 460 | 6.5 | 515 | 527 | 6.0 | 539 | 594 | 7.9 | 654 | 9.4 |
| Connecticut | 389 | 9.5 | 455 | 8.5 | 509 | 521 | 5.7 | 532 | 588 | 5.7 | 647 | 6.0 |
| Florida | 366 | 7.2 | 421 | 7.5 | 472 | 485 | 6.4 | 498 | 549 | 8.2 | 604 | 7.3 |

NOTE: This table shows the threshold (or cut) scores for the following: (a) 10th percentile- the bottom 10 percent of students; (b) 25th percentile- the bottom 25 percent of students; (d) 75th percentile- the top 25 percent of students; (e) 90th percentile- the top 10 percent of students. The percentile ranges are specific to each education system's distribution of scores, enabling users to compare cut scores across education systems. This figure also shows the 95% confidence interval for the average. The lower threshold (or cut) score for the 95% confidence interval for the average is the average score minus 2 standard errors. The upper threshold (or cut) score for the 95% confidence interval for the average is the average score plus 2 standard errors. Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Detail may not sum to totals because of rounding. Scores are reported on a scale from 0 to 1,000. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only. SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-11. Standard errors for figure 4: Difference in average scores of 15-year-old female and male students on PISA science literacy scale, by education system: 2012

| Education system | Female-male difference | s.e. | Education system | Female-male difference | s.e. |
|--------------------------------|------------------------|------------|--------------------------------------|------------------------|------|
| OECD average | -1 | 0.6 | | | |
| Latin America average | -5 | 0.9 | | | |
| <i>Jordan</i> | 43 | 6.4 | Czech Republic | -1 | 4.0 |
| <i>Qatar</i> | 35 | 1.7 | <i>Chinese Taipei</i> | -1 | 6.4 |
| <i>United Arab Emirates</i> | 28 | 5.1 | <i>Tunisia</i> | -1 | 2.9 |
| <i>Bulgaria</i> | 20 | 4.5 | <i>Vietnam</i> | -1 | 2.8 |
| <i>Thailand</i> | 19 | 3.4 | <i>Brazil</i> | -2 | 1.7 |
| <i>Montenegro, Republic of</i> | 17 | 2.4 | Italy | -3 | 2.5 |
| Finland | 16 | 3.0 | Canada | -3 | 2.1 |
| <i>Latvia</i> | 15 | 3.6 | Hungary | -3 | 3.3 |
| <i>Lithuania</i> | 15 | 2.3 | Netherlands | -3 | 2.9 |
| Greece | 13 | 3.1 | Korea, Republic of | -3 | 5.1 |
| <i>Cyprus</i> | 13 | 2.5 | Belgium | -4 | 3.6 |
| <i>Malaysia</i> | 11 | 3.5 | Ireland | -4 | 4.4 |
| Turkey | 10 | 4.2 | New Zealand | -5 | 4.9 |
| Slovenia | 9 | 2.8 | Australia | -5 | 3.0 |
| <i>Kazakhstan</i> | 9 | 2.9 | <i>Shanghai-China</i> | -5 | 2.7 |
| Sweden | 7 | 3.3 | <i>Peru</i> | -6 | 4.0 |
| <i>Albania</i> | 7 | 3.2 | Switzerland | -6 | 2.6 |
| <i>Argentina</i> | 7 | 3.4 | Mexico | -6 | 1.1 |
| <i>Russian Federation</i> | 6 | 2.9 | <i>Hong Kong-China</i> | -7 | 4.2 |
| <i>Romania</i> | 5 | 3.2 | Chile | -7 | 3.3 |
| <i>Serbia, Republic of</i> | 4 | 3.9 | Slovak Republic | -7 | 4.5 |
| Norway | 4 | 3.2 | Spain | -7 | 2.1 |
| Puerto Rico | 3 | 5.2 | Austria | -9 | 5.0 |
| <i>Indonesia</i> | 3 | 3.1 | Denmark | -10 | 2.7 |
| Iceland | 3 | 3.6 | Japan | -11 | 4.3 |
| Poland | 3 | 3.0 | <i>Costa Rica</i> | -12 | 3.2 |
| France | 2 | 3.7 | United Kingdom | -13 | 4.7 |
| Estonia | 2 | 2.7 | Luxembourg | -15 | 2.2 |
| <i>Croatia</i> | 2 | 3.8 | <i>Liechtenstein</i> | -17 | 9.1 |
| Portugal | 2 | 2.6 | <i>Colombia</i> | -18 | 3.4 |
| United States | 2 | 2.7 | | | |
| <i>Macao-China</i> | 1 | 1.7 | Education systems under | | |
| <i>Uruguay</i> | 1 | 3.4 | the U.S. PISA national center | | |
| Israel | 1 | 7.6 | <i>Massachusetts</i> | -3 | 4.6 |
| <i>Singapore</i> | 1 | 2.6 | <i>Florida</i> | -13 | 4.8 |
| Germany | 1 | 3.0 | <i>Connecticut</i> | -14 | 4.5 |

NOTE: Education systems are ordered by female-male difference in 2012 average score. Differences were computed using unrounded numbers. Scores are reported on a scale from 0 to 1,000. The OECD average is the average of the national average differences of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national average differences of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-13. Standard errors for table 9: Percentage distribution of 15-year-old students on PISA reading literacy scale, by proficiency level and education system: 2012

| Education system | Below level 1b | | Level 1b | | Level 1a | | Level 2 | | Level 3 | | Level 4 | | Level 5 | | Level 6 | |
|--|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|---------|------|---------|------|
| | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. | Percent | s.e. |
| OECD average | 1.3 | 0.05 | 4.4 | 0.08 | 12.3 | 0.13 | 23.5 | 0.16 | 29.1 | 0.17 | 21.0 | 0.16 | 7.3 | 0.10 | 1.1 | 0.04 |
| Latin America average | 4.7 | 0.21 | 13.7 | 0.35 | 27.5 | 0.37 | 31.2 | 0.39 | 17.6 | 0.36 | 4.7 | 0.20 | 0.5 | 0.05 | #! | † |
| <i>Albania</i> | 12.0 | 0.84 | 15.9 | 1.00 | 24.4 | 1.23 | 24.7 | 1.01 | 15.9 | 0.73 | 5.9 | 0.61 | 1.1 | 0.24 | ‡ | † |
| <i>Argentina</i> | 8.1 | 0.80 | 17.7 | 1.20 | 27.7 | 1.34 | 27.3 | 1.12 | 14.6 | 0.91 | 4.0 | 0.57 | 0.5! | 0.15 | ‡ | † |
| <i>Australia</i> | 0.9 | 0.11 | 3.1 | 0.21 | 10.2 | 0.42 | 21.6 | 0.47 | 29.1 | 0.53 | 23.3 | 0.51 | 9.8 | 0.46 | 1.9 | 0.19 |
| <i>Austria</i> | 0.8 | 0.24 | 4.8 | 0.64 | 13.8 | 0.84 | 24.2 | 0.89 | 29.6 | 0.92 | 21.2 | 0.94 | 5.2 | 0.59 | 0.3 | 0.10 |
| <i>Belgium</i> | 1.6 | 0.31 | 4.1 | 0.40 | 10.4 | 0.55 | 20.4 | 0.62 | 27.3 | 0.70 | 24.4 | 0.71 | 10.4 | 0.54 | 1.4 | 0.17 |
| <i>Brazil</i> | 4.0 | 0.36 | 14.8 | 0.64 | 30.4 | 0.79 | 30.1 | 0.77 | 15.8 | 0.63 | 4.4 | 0.37 | 0.5 | 0.12 | ‡ | † |
| <i>Bulgaria</i> | 8.0 | 1.07 | 12.8 | 1.15 | 18.6 | 1.10 | 22.2 | 1.16 | 21.4 | 1.10 | 12.7 | 1.03 | 3.8 | 0.56 | 0.5! | 0.18 |
| <i>Canada</i> | 0.5 | 0.09 | 2.4 | 0.19 | 8.0 | 0.36 | 19.4 | 0.55 | 31.0 | 0.72 | 25.8 | 0.59 | 10.8 | 0.53 | 2.1 | 0.22 |
| <i>Chile</i> | 1.0 | 0.19 | 8.1 | 0.79 | 23.9 | 1.08 | 35.1 | 1.08 | 24.3 | 1.06 | 6.9 | 0.62 | 0.6 | 0.11 | ‡ | † |
| <i>Chinese Taipei</i> | 0.6 | 0.15 | 2.5 | 0.32 | 8.4 | 0.65 | 18.1 | 0.83 | 29.9 | 0.92 | 28.7 | 1.01 | 10.4 | 0.73 | 1.4 | 0.32 |
| <i>Colombia</i> | 5.0 | 0.76 | 15.4 | 0.98 | 31.0 | 1.29 | 30.5 | 1.22 | 14.5 | 0.91 | 3.2 | 0.50 | 0.3! | 0.12 | ‡ | † |
| <i>Costa Rica</i> | 0.8! | 0.24 | 7.3 | 1.02 | 24.3 | 1.25 | 38.1 | 1.40 | 22.9 | 1.42 | 6.0 | 0.78 | 0.6! | 0.19 | ‡ | † |
| <i>Croatia</i> | 0.7! | 0.25 | 4.0 | 0.59 | 13.9 | 0.97 | 27.8 | 1.07 | 31.2 | 1.24 | 17.8 | 1.09 | 4.2 | 0.66 | 0.2! | 0.11 |
| <i>Cyprus</i> | 6.1 | 0.32 | 9.7 | 0.44 | 17.0 | 0.61 | 25.1 | 0.78 | 24.9 | 0.75 | 13.2 | 0.64 | 3.5 | 0.34 | 0.5 | 0.12 |
| <i>Czech Republic</i> | 0.6! | 0.27 | 3.5 | 0.56 | 12.7 | 0.94 | 26.4 | 1.30 | 31.3 | 1.23 | 19.4 | 1.13 | 5.3 | 0.49 | 0.8 | 0.16 |
| <i>Denmark</i> | 0.8! | 0.30 | 3.1 | 0.39 | 10.7 | 0.77 | 25.8 | 0.92 | 33.6 | 0.85 | 20.5 | 0.86 | 5.1 | 0.58 | 0.4! | 0.12 |
| <i>Estonia</i> | ‡ | † | 1.3 | 0.28 | 7.7 | 0.61 | 22.7 | 0.94 | 35.0 | 1.06 | 24.9 | 1.08 | 7.5 | 0.71 | 0.9 | 0.18 |
| <i>Finland</i> | 0.7 | 0.16 | 2.4 | 0.38 | 8.2 | 0.57 | 19.1 | 0.81 | 29.3 | 0.70 | 26.8 | 0.84 | 11.3 | 0.60 | 2.2 | 0.26 |
| <i>France</i> | 2.1 | 0.40 | 4.9 | 0.43 | 11.9 | 0.70 | 18.9 | 0.85 | 26.3 | 0.84 | 23.0 | 0.67 | 10.6 | 0.62 | 2.3 | 0.41 |
| <i>Germany</i> | 0.5! | 0.18 | 3.3 | 0.40 | 10.7 | 0.67 | 22.1 | 0.93 | 29.9 | 0.86 | 24.6 | 0.88 | 8.3 | 0.64 | 0.7! | 0.23 |
| <i>Greece</i> | 2.6 | 0.40 | 5.9 | 0.60 | 14.2 | 0.83 | 25.1 | 1.06 | 30.0 | 1.02 | 17.2 | 1.19 | 4.6 | 0.59 | 0.5 | 0.13 |
| <i>Hong Kong-China</i> | 0.2! | 0.09 | 1.3 | 0.24 | 5.3 | 0.61 | 14.3 | 0.79 | 29.2 | 1.21 | 32.9 | 1.39 | 14.9 | 1.00 | 1.9 | 0.39 |
| <i>Hungary</i> | 0.7! | 0.24 | 5.2 | 0.64 | 13.8 | 0.88 | 24.3 | 1.17 | 29.9 | 1.00 | 20.4 | 1.05 | 5.3 | 0.68 | 0.4! | 0.13 |
| <i>Iceland</i> | 2.3 | 0.33 | 5.4 | 0.47 | 13.3 | 0.63 | 24.7 | 0.92 | 29.9 | 1.09 | 18.6 | 1.12 | 5.2 | 0.41 | 0.6! | 0.21 |
| <i>Indonesia</i> | 4.1 | 0.81 | 16.3 | 1.28 | 34.8 | 1.56 | 31.6 | 1.54 | 11.5 | 1.28 | 1.5! | 0.53 | ‡ | † | ‡ | † |
| <i>Ireland</i> | 0.3! | 0.13 | 1.9 | 0.35 | 7.5 | 0.69 | 19.6 | 1.19 | 33.4 | 1.17 | 26.0 | 0.90 | 10.1 | 0.67 | 1.3 | 0.35 |
| <i>Israel</i> | 3.8 | 0.59 | 6.9 | 0.74 | 12.9 | 0.96 | 20.8 | 0.87 | 25.3 | 0.81 | 20.6 | 1.03 | 8.1 | 0.77 | 1.5 | 0.30 |
| <i>Italy</i> | 1.6 | 0.15 | 5.2 | 0.29 | 12.7 | 0.48 | 23.7 | 0.57 | 29.7 | 0.53 | 20.5 | 0.62 | 6.1 | 0.33 | 0.6 | 0.07 |
| <i>Japan</i> | 0.6 | 0.16 | 2.4 | 0.37 | 6.7 | 0.67 | 16.6 | 0.89 | 26.7 | 0.98 | 28.4 | 1.08 | 14.6 | 0.99 | 3.9 | 0.59 |
| <i>Jordan</i> | 7.5 | 0.84 | 14.9 | 0.79 | 28.3 | 1.01 | 30.8 | 1.14 | 15.5 | 0.83 | 2.9 | 0.63 | ‡ | † | ‡ | † |
| <i>Kazakhstan</i> | 4.2 | 0.47 | 17.3 | 1.24 | 35.6 | 1.15 | 31.3 | 1.12 | 10.4 | 0.87 | 1.2 | 0.24 | ‡ | † | ‡ | † |
| <i>Korea, Republic of</i> | 0.4 | 0.13 | 1.7 | 0.39 | 5.5 | 0.60 | 16.4 | 0.94 | 30.8 | 1.00 | 31.0 | 1.06 | 12.6 | 1.05 | 1.6 | 0.32 |
| <i>Latvia</i> | 0.7! | 0.24 | 3.7 | 0.54 | 12.6 | 0.96 | 26.7 | 1.31 | 33.1 | 1.05 | 19.1 | 0.88 | 3.9 | 0.56 | 0.3! | 0.11 |
| <i>Liechtenstein</i> | # | † | ‡ | † | 10.5 | 1.85 | 22.4 | 3.44 | 28.6 | 4.53 | 25.7 | 2.44 | 10.4 | 2.44 | ‡ | † |
| <i>Lithuania</i> | 1.0 | 0.19 | 4.6 | 0.49 | 15.6 | 1.06 | 28.1 | 1.13 | 31.1 | 0.94 | 16.3 | 0.78 | 3.1 | 0.35 | 0.2! | 0.07 |
| <i>Luxembourg</i> | 2.0 | 0.21 | 6.3 | 0.33 | 13.8 | 0.81 | 23.4 | 0.71 | 25.8 | 0.64 | 19.7 | 0.64 | 7.5 | 0.35 | 1.4 | 0.20 |
| <i>Macao-China</i> | 0.3! | 0.11 | 2.1 | 0.22 | 9.0 | 0.42 | 23.3 | 0.58 | 34.3 | 0.67 | 24.0 | 0.60 | 6.4 | 0.48 | 0.6! | 0.21 |
| <i>Malaysia</i> | 5.8 | 0.59 | 16.4 | 1.03 | 30.5 | 0.99 | 31.0 | 1.09 | 13.6 | 1.11 | 2.5 | 0.45 | ‡ | † | ‡ | † |
| <i>Mexico</i> | 2.6 | 0.22 | 11.0 | 0.53 | 27.5 | 0.70 | 34.5 | 0.62 | 19.6 | 0.54 | 4.5 | 0.25 | 0.4 | 0.08 | ‡ | † |
| <i>Montenegro, Republic of</i> | 4.4 | 0.53 | 13.2 | 0.62 | 25.7 | 0.94 | 29.2 | 0.77 | 19.9 | 0.76 | 6.6 | 0.53 | 0.9 | 0.19 | ‡ | † |
| <i>Netherlands</i> | ‡ | † | 2.8 | 0.49 | 10.3 | 0.93 | 21.0 | 1.27 | 29.2 | 1.32 | 26.1 | 1.36 | 9.0 | 0.72 | 0.8 | 0.19 |
| <i>New Zealand</i> | 1.3 | 0.28 | 4.0 | 0.46 | 11.0 | 0.67 | 20.8 | 0.76 | 26.3 | 1.06 | 22.7 | 1.06 | 10.9 | 0.62 | 3.0 | 0.37 |
| <i>Norway</i> | 1.7 | 0.31 | 3.7 | 0.36 | 10.8 | 0.69 | 21.9 | 1.03 | 29.4 | 1.35 | 22.3 | 1.21 | 8.5 | 0.61 | 1.7 | 0.31 |
| <i>Peru</i> | 9.8 | 0.87 | 20.6 | 1.11 | 29.5 | 0.98 | 24.9 | 1.02 | 11.4 | 0.96 | 3.3 | 0.61 | 0.5! | 0.21 | ‡ | † |
| <i>Poland</i> | 0.3! | 0.11 | 2.1 | 0.35 | 8.1 | 0.74 | 21.4 | 0.90 | 32.0 | 0.89 | 26.0 | 0.96 | 8.6 | 0.76 | 1.4 | 0.37 |
| <i>Portugal</i> | 1.3 | 0.30 | 5.1 | 0.53 | 12.3 | 0.98 | 25.5 | 1.16 | 30.2 | 1.46 | 19.7 | 1.07 | 5.3 | 0.57 | 0.5! | 0.15 |
| Puerto Rico | 5.1 | 1.05 | 16.7 | 1.76 | 29.8 | 2.05 | 28.5 | 1.92 | 16.1 | 1.66 | 3.6 | 0.65 | ‡ | † | ‡ | † |
| <i>Qatar</i> | 13.6 | 0.32 | 18.9 | 0.48 | 24.6 | 0.44 | 21.9 | 0.50 | 13.5 | 0.43 | 5.8 | 0.21 | 1.4 | 0.13 | 0.2 | 0.05 |
| <i>Romania</i> | 2.5 | 0.38 | 10.3 | 0.82 | 24.4 | 1.28 | 30.6 | 1.12 | 21.8 | 1.17 | 8.7 | 0.88 | 1.5 | 0.35 | ‡ | † |
| <i>Russian Federation</i> | 1.1 | 0.18 | 5.2 | 0.49 | 16.0 | 1.03 | 29.5 | 1.08 | 28.3 | 1.05 | 15.3 | 0.93 | 4.2 | 0.51 | 0.5 | 0.12 |
| <i>Serbia, Republic of</i> | 2.6 | 0.40 | 9.3 | 0.73 | 21.3 | 1.09 | 30.8 | 1.20 | 23.3 | 1.15 | 10.5 | 0.81 | 2.0 | 0.39 | 0.2! | 0.08 |
| <i>Shanghai-China</i> | ‡ | † | 0.3! | 0.11 | 2.5 | 0.34 | 11.0 | 0.85 | 25.3 | 0.85 | 35.7 | 1.07 | 21.3 | 0.98 | 3.8 | 0.65 |
| <i>Singapore</i> | 0.5 | 0.12 | 1.9 | 0.27 | 7.5 | 0.41 | 16.7 | 0.65 | 25.4 | 0.66 | 26.8 | 0.79 | 16.2 | 0.73 | 5.0 | 0.43 |
| <i>Slovak Republic</i> | 4.1 | 0.77 | 7.9 | 0.80 | 16.2 | 1.06 | 25.0 | 1.08 | 26.8 | 1.38 | 15.7 | 0.96 | 4.1 | 0.60 | ‡ | † |
| <i>Slovenia</i> | 1.2 | 0.14 | 4.9 | 0.37 | 15.0 | 0.71 | 27.2 | 0.77 | 28.4 | 0.94 | 18.2 | 0.63 | 4.7 | 0.45 | 0.3! | 0.12 |
| <i>Spain</i> | 1.3 | 0.17 | 4.4 | 0.38 | 12.6 | 0.47 | 25.8 | 0.81 | 31.2 | 0.68 | 19.2 | 0.62 | 5.0 | 0.30 | 0.5 | 0.10 |
| <i>Sweden</i> | 2.9 | 0.39 | 6.0 | 0.64 | 13.9 | 0.72 | 23.5 | 0.88 | 27.3 | 0.73 | 18.6 | 0.93 | 6.7 | 0.53 | 1.2 | 0.20 |
| <i>Switzerland</i> | 0.5 | 0.14 | 2.9 | 0.34 | 10.3 | 0.59 | 21.9 | 0.86 | 31.5 | 0.71 | 23.8 | 0.84 | 8.2 | 0.60 | 1.0 | 0.25 |
| <i>Thailand</i> | 1.2 | 0.29 | 7.7 | 0.77 | 24.1 | 0.98 | 36.0 | 1.12 | 23.5 | 1.13 | 6.7 | 0.79 | 0.8 | 0.21 | ‡ | † |
| <i>Tunisia</i> | 6.2 | 0.91 | 15.5 | 1.20 | 27.6 | 1.31 | 31.4 | 1.43 | 15.6 | 1.15 | 3.5 | 0.69 | ‡ | † | ‡ | † |
| <i>Turkey</i> | 0.6 | 0.15 | 4.5 | 0.57 | 16.6 | 1.07 | 30.8 | 1.39 | 28.7 | 1.34 | 14.5 | 1.39 | 4.1 | 0.79 | 0.3! | 0.13 |
| <i>United Arab Emirates</i> | 3.3 | 0.34 | 10.4 | 0.65 | 21.8 | 0.72 | 28.6 | 0.72 | 24.0 | 0.77 | 9.7 | 0.58 | 2.1 | 0.28 | 0.2! | 0.06 |
| <i>United Kingdom</i> | 1.5 | 0.27 | 4.0 | 0.54 | 11.2 | 0.79 | 23.5 | 1.01 | 29.9 | 1.08 | 21.3 | 1.14 | 7.5 | 0.59 | 1.3 | 0.24 |
| <i>United States</i> | 0.8! | 0.24 | 3.6 | 0.49 | 12.3 | 0.89 | 24.9 | 0.99 | 30.5 | 0.88 | 20.1 | 1.08 | 6.9 | 0.59 | 1.0 | 0.22 |
| <i>Uruguay</i> | 6.4 | 0.70 | 14.7 | 0.84 | 25.9 | 0.88 | 28.9 | 1.00 | 17.4 | 0.71 | 5.7 | 0.62 | 0.9 | 0.26 | ‡ | † |
| <i>Vietnam</i> | ‡ | † | 1.5! | 0.48 | 7.8 | 1.10 | 23.7 | 1.40 | 39.0 | 1.47 | 23.4 | 1.47 | 4.2 | 0.71 | 0.4! | 0.16 |
| Education systems under the U.S. PISA national center | | | | | | | | | | | | | | | | |
| <i>Connecticut</i> | ‡ | † | 3.2 | 0.87 | 9.7 | 1.26 | 19.6 | 1.49 | 28.2 | 1.32 | 24.4 | 1.8 | | | | |

Table C-14. Standard errors for figure 5: Distribution of achievement of 15-year-old students on PISA reading literacy scale, by education system: 2012

| Education system | 10th percentile | | 25th percentile | | Average score | | | | 75th percentile | | 90th percentile | | | |
|--|-----------------|------------|-----------------|------------|--|--|------------|------------|-------------------------------|------------|-----------------|------------|-------|------|
| | Score | s.e. | Score | s.e. | Lower 95% confidence interval | | Average | s.e. | Upper 95% confidence interval | | Score | s.e. | Score | s.e. |
| | | | | | Lower 95% confidence interval cutpoint | Upper 95% confidence interval cutpoint | | | | | | | | |
| OECD average | 372 | 0.9 | 435 | 0.7 | 495 | 496 | 0.5 | 497 | 563 | 0.5 | 613 | 0.6 | | |
| Latin America average | 299 | 1.7 | 356 | 1.6 | 411 | 414 | 1.3 | 416 | 474 | 1.3 | 525 | 1.6 | | |
| <i>Shanghai-China</i> | 463 | 4.6 | 518 | 3.6 | 564 | 570 | 2.9 | 575 | 626 | 2.8 | 667 | 3.5 | | |
| <i>Hong Kong-China</i> | 430 | 5.4 | 493 | 4.4 | 539 | 545 | 2.8 | 550 | 604 | 3.0 | 648 | 3.4 | | |
| <i>Singapore</i> | 408 | 2.9 | 475 | 2.1 | 539 | 542 | 1.4 | 545 | 614 | 2.1 | 668 | 3.2 | | |
| Japan | 409 | 6.5 | 475 | 4.8 | 531 | 538 | 3.7 | 545 | 607 | 3.8 | 658 | 4.4 | | |
| Korea, Republic of | 424 | 6.2 | 483 | 4.3 | 528 | 536 | 3.9 | 544 | 596 | 4.1 | 640 | 4.0 | | |
| Finland | 399 | 4.3 | 463 | 3.5 | 519 | 524 | 2.4 | 529 | 590 | 2.3 | 639 | 2.5 | | |
| Ireland | 410 | 5.7 | 469 | 3.6 | 518 | 523 | 2.6 | 528 | 582 | 2.7 | 631 | 3.2 | | |
| Canada | 403 | 2.8 | 464 | 2.2 | 519 | 523 | 1.9 | 527 | 587 | 2.2 | 638 | 2.6 | | |
| <i>Chinese Taipei</i> | 399 | 5.2 | 467 | 4.4 | 517 | 523 | 3.0 | 529 | 587 | 2.8 | 633 | 3.6 | | |
| Poland | 404 | 4.6 | 461 | 3.2 | 512 | 518 | 3.1 | 524 | 579 | 3.6 | 626 | 4.8 | | |
| Estonia | 412 | 3.4 | 463 | 3.0 | 512 | 516 | 2.0 | 520 | 571 | 2.4 | 618 | 2.8 | | |
| <i>Liechtenstein</i> | 391 | 9.5 | 452 | 7.8 | 507 | 516 | 4.1 | 524 | 584 | 6.9 | 630 | 10.6 | | |
| New Zealand | 374 | 4.9 | 443 | 3.2 | 507 | 512 | 2.4 | 517 | 586 | 3.1 | 645 | 4.0 | | |
| Australia | 386 | 2.4 | 448 | 2.2 | 509 | 512 | 1.6 | 515 | 579 | 1.9 | 634 | 2.3 | | |
| Netherlands | 386 | 6.6 | 451 | 5.1 | 504 | 511 | 3.5 | 518 | 579 | 3.7 | 625 | 3.6 | | |
| Switzerland | 388 | 3.9 | 451 | 3.3 | 504 | 509 | 2.6 | 514 | 573 | 2.8 | 622 | 3.2 | | |
| <i>Macao-China</i> | 400 | 2.4 | 457 | 1.8 | 507 | 509 | 0.9 | 511 | 566 | 1.4 | 611 | 1.6 | | |
| Belgium | 373 | 4.3 | 444 | 3.2 | 504 | 509 | 2.3 | 513 | 583 | 2.2 | 633 | 2.3 | | |
| <i>Vietnam</i> | 411 | 8.2 | 462 | 5.4 | 499 | 508 | 4.4 | 517 | 559 | 3.9 | 599 | 5.0 | | |
| Germany | 384 | 4.8 | 447 | 3.6 | 502 | 508 | 2.8 | 513 | 574 | 3.1 | 621 | 3.2 | | |
| France | 358 | 5.4 | 435 | 4.3 | 500 | 505 | 2.8 | 511 | 584 | 3.6 | 639 | 3.9 | | |
| Norway | 375 | 4.8 | 442 | 4.0 | 498 | 504 | 3.2 | 510 | 573 | 3.4 | 627 | 3.9 | | |
| United Kingdom | 372 | 7.0 | 438 | 4.8 | 492 | 499 | 3.5 | 506 | 567 | 3.4 | 619 | 3.8 | | |
| United States | 378 | 4.8 | 436 | 4.5 | 490 | 498 | 3.7 | 505 | 561 | 3.9 | 614 | 4.0 | | |
| Denmark | 385 | 5.1 | 442 | 3.5 | 491 | 496 | 2.6 | 501 | 555 | 2.4 | 602 | 2.8 | | |
| Czech Republic | 378 | 4.7 | 434 | 3.7 | 487 | 493 | 2.9 | 499 | 554 | 3.6 | 604 | 3.8 | | |
| Italy | 359 | 2.9 | 427 | 2.6 | 486 | 490 | 2.0 | 494 | 559 | 2.1 | 609 | 2.2 | | |
| Austria | 365 | 5.1 | 427 | 3.9 | 484 | 490 | 2.8 | 495 | 557 | 3.0 | 603 | 2.5 | | |
| <i>Latvia</i> | 375 | 5.6 | 434 | 3.0 | 484 | 489 | 2.4 | 493 | 548 | 2.9 | 593 | 2.8 | | |
| Hungary | 363 | 5.2 | 427 | 4.6 | 482 | 488 | 3.2 | 495 | 555 | 3.3 | 603 | 3.9 | | |
| Spain | 367 | 3.6 | 430 | 2.6 | 484 | 488 | 1.9 | 492 | 552 | 2.1 | 601 | 2.3 | | |
| Luxembourg | 347 | 2.7 | 418 | 2.4 | 485 | 488 | 1.5 | 491 | 564 | 2.2 | 620 | 2.3 | | |
| Portugal | 362 | 6.0 | 429 | 4.9 | 480 | 488 | 3.8 | 495 | 554 | 3.5 | 604 | 3.5 | | |
| Israel | 329 | 7.5 | 414 | 6.8 | 476 | 486 | 5.0 | 496 | 568 | 4.5 | 624 | 4.5 | | |
| <i>Croatia</i> | 370 | 5.1 | 427 | 4.4 | 478 | 485 | 3.3 | 491 | 546 | 3.8 | 593 | 4.9 | | |
| Sweden | 343 | 5.4 | 416 | 4.3 | 477 | 483 | 3.0 | 489 | 558 | 3.3 | 614 | 4.2 | | |
| Iceland | 352 | 4.1 | 422 | 2.9 | 479 | 483 | 1.8 | 486 | 551 | 2.9 | 602 | 2.4 | | |
| Slovenia | 362 | 2.5 | 420 | 1.9 | 479 | 481 | 1.2 | 484 | 548 | 2.1 | 598 | 2.5 | | |
| <i>Lithuania</i> | 363 | 4.0 | 419 | 3.9 | 472 | 477 | 2.5 | 482 | 538 | 2.8 | 585 | 3.1 | | |
| Greece | 346 | 6.0 | 416 | 4.5 | 471 | 477 | 3.3 | 484 | 545 | 3.4 | 597 | 3.9 | | |
| Turkey | 365 | 4.6 | 417 | 4.0 | 467 | 475 | 4.2 | 484 | 534 | 5.6 | 588 | 6.8 | | |
| <i>Russian Federation</i> | 359 | 4.5 | 415 | 4.0 | 469 | 475 | 3.0 | 481 | 537 | 3.9 | 592 | 4.2 | | |
| Slovak Republic | 321 | 8.4 | 396 | 6.8 | 454 | 463 | 4.2 | 471 | 538 | 4.1 | 591 | 5.2 | | |
| <i>Cyprus</i> | 297 | 3.3 | 378 | 2.4 | 447 | 449 | 1.2 | 451 | 528 | 2.1 | 583 | 2.6 | | |
| <i>Serbia, Republic of</i> | 325 | 5.5 | 384 | 4.4 | 439 | 446 | 3.4 | 453 | 509 | 4.1 | 566 | 4.6 | | |
| <i>United Arab Emirates</i> | 316 | 3.7 | 376 | 3.1 | 437 | 442 | 2.5 | 447 | 508 | 2.8 | 562 | 3.1 | | |
| Chile | 339 | 4.2 | 388 | 3.8 | 436 | 441 | 2.9 | 447 | 496 | 3.3 | 541 | 3.3 | | |
| <i>Thailand</i> | 341 | 4.4 | 389 | 3.5 | 435 | 441 | 3.1 | 447 | 494 | 3.7 | 541 | 4.4 | | |
| <i>Costa Rica</i> | 344 | 5.4 | 391 | 4.3 | 434 | 441 | 3.5 | 448 | 490 | 4.2 | 536 | 5.0 | | |
| <i>Romania</i> | 322 | 4.4 | 375 | 4.4 | 430 | 438 | 4.0 | 446 | 501 | 5.5 | 555 | 5.3 | | |
| <i>Bulgaria</i> | 275 | 8.0 | 353 | 8.2 | 424 | 436 | 6.0 | 448 | 523 | 6.0 | 585 | 6.1 | | |
| Mexico | 319 | 2.5 | 370 | 1.9 | 421 | 424 | 1.5 | 427 | 479 | 1.8 | 525 | 1.9 | | |
| <i>Montenegro, Republic of</i> | 301 | 3.0 | 360 | 2.5 | 420 | 422 | 1.2 | 424 | 487 | 1.8 | 540 | 3.4 | | |
| <i>Uruguay</i> | 285 | 5.3 | 348 | 4.3 | 405 | 411 | 3.2 | 418 | 477 | 3.0 | 534 | 4.1 | | |
| <i>Brazil</i> | 302 | 2.8 | 353 | 2.4 | 406 | 410 | 2.1 | 414 | 468 | 2.7 | 520 | 3.0 | | |
| <i>Tunisia</i> | 286 | 7.1 | 346 | 5.9 | 395 | 404 | 4.5 | 413 | 466 | 4.5 | 515 | 5.6 | | |
| Puerto Rico | 292 | 6.9 | 344 | 5.9 | 393 | 404 | 5.3 | 414 | 465 | 6.1 | 516 | 6.7 | | |
| <i>Colombia</i> | 295 | 5.4 | 348 | 4.0 | 397 | 403 | 3.4 | 410 | 460 | 3.7 | 509 | 4.5 | | |
| <i>Jordan</i> | 280 | 6.4 | 343 | 4.5 | 392 | 399 | 3.6 | 406 | 462 | 3.2 | 510 | 4.6 | | |
| <i>Malaysia</i> | 288 | 4.4 | 343 | 3.7 | 392 | 398 | 3.3 | 405 | 457 | 3.9 | 503 | 4.3 | | |
| <i>Indonesia</i> | 299 | 6.1 | 346 | 4.7 | 388 | 396 | 4.2 | 405 | 447 | 4.6 | 492 | 6.1 | | |
| <i>Argentina</i> | 274 | 5.4 | 332 | 4.5 | 389 | 396 | 3.7 | 403 | 462 | 4.1 | 516 | 4.4 | | |
| <i>Albania</i> | 247 | 7.2 | 325 | 4.8 | 388 | 394 | 3.2 | 400 | 473 | 3.2 | 536 | 3.4 | | |
| <i>Kazakhstan</i> | 297 | 4.4 | 344 | 3.1 | 387 | 393 | 2.7 | 398 | 444 | 3.4 | 487 | 3.5 | | |
| <i>Qatar</i> | 242 | 2.0 | 310 | 1.7 | 386 | 388 | 0.8 | 389 | 465 | 1.9 | 535 | 2.3 | | |
| <i>Peru</i> | 263 | 5.1 | 319 | 4.7 | 375 | 384 | 4.3 | 393 | 447 | 5.2 | 504 | 6.4 | | |
| Education systems under the U.S. PISA national center | | | | | | | | | | | | | | |
| <i>Massachusetts</i> | 399 | 7.7 | 464 | 7.1 | 515 | 527 | 6.1 | 539 | 595 | 7.7 | 652 | 7.3 | | |
| <i>Connecticut</i> | 388 | 9.6 | 456 | 7.5 | 508 | 521 | 6.5 | 534 | 590 | 6.0 | 645 | 7.3 | | |
| <i>Florida</i> | 377 | 7.2 | 433 | 7.1 | 480 | 492 | 6.1 | 504 | 555 | 7.0 | 602 | 7.4 | | |

NOTE: This table shows the threshold (or cut) scores for the following: (a) 10th percentile- the bottom 10 percent of students; (b) 25th percentile- the bottom 25 percent of students; (d) 75th percentile- the top 25 percent of students; (e) 90th percentile- the top 10 percent of students. The percentile ranges are specific to each education system's distribution of scores, enabling users to compare cut scores across education systems. This figure also shows the 95% confidence interval for the average. The lower threshold (or cut) score for the 95% confidence interval for the average is the average score minus 2 standard errors. The upper threshold (or cut) score for the 95% confidence interval for the average is the average score plus 2 standard errors. Education systems are ordered by 2012 average score. The OECD average is the average of the national averages of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Detail may not sum to totals because of rounding. Scores are reported on a scale from 0 to 1,000. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only. SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.

Table C-15. Standard errors for figure 6: Difference in average scores of 15-year-old female and male students on PISA reading literacy scale, by education system: 2012

| Education system | Female-male difference | s.e. | Education system | Female-male difference | s.e. |
|--------------------------------|------------------------|------------|--|------------------------|------|
| OECD average | 38 | 0.6 | | | |
| Latin America average | 27 | 1.0 | | | |
| <i>Jordan</i> | 75 | 6.3 | <i>Macao-China</i> | 36 | 1.7 |
| <i>Qatar</i> | 70 | 1.6 | <i>Uruguay</i> | 35 | 3.5 |
| <i>Bulgaria</i> | 70 | 5.2 | Canada | 35 | 2.1 |
| <i>Cyprus</i> | 64 | 3.0 | Australia | 34 | 2.9 |
| <i>Montenegro, Republic of</i> | 62 | 3.1 | New Zealand | 34 | 5.0 |
| Finland | 62 | 3.1 | <i>Chinese Taipei</i> | 32 | 6.4 |
| Slovenia | 56 | 2.7 | <i>Singapore</i> | 32 | 2.6 |
| <i>United Arab Emirates</i> | 55 | 4.8 | Belgium | 32 | 3.5 |
| <i>Lithuania</i> | 55 | 2.3 | <i>Vietnam</i> | 31 | 2.6 |
| <i>Thailand</i> | 55 | 3.2 | United States | 31 | 2.6 |
| <i>Latvia</i> | 55 | 4.0 | Denmark | 31 | 2.8 |
| Sweden | 51 | 3.6 | <i>Tunisia</i> | 31 | 3.1 |
| Iceland | 51 | 3.3 | <i>Brazil</i> | 31 | 1.9 |
| Greece | 50 | 3.7 | Luxembourg | 30 | 2.0 |
| <i>Croatia</i> | 48 | 4.0 | Spain | 29 | 2.0 |
| Norway | 46 | 3.3 | Ireland | 29 | 4.2 |
| <i>Serbia, Republic of</i> | 46 | 3.8 | <i>Indonesia</i> | 28 | 3.4 |
| Turkey | 46 | 4.0 | Netherlands | 26 | 3.1 |
| Germany | 44 | 2.5 | <i>Hong Kong-China</i> | 25 | 4.7 |
| Israel | 44 | 7.9 | <i>Costa Rica</i> | 25 | 2.6 |
| France | 44 | 4.2 | United Kingdom | 25 | 4.6 |
| Estonia | 44 | 2.4 | <i>Liechtenstein</i> | 24 | 8.7 |
| Poland | 42 | 2.9 | Japan | 24 | 4.1 |
| <i>Romania</i> | 40 | 4.1 | <i>Shanghai-China</i> | 24 | 2.5 |
| <i>Malaysia</i> | 40 | 3.1 | Mexico | 24 | 1.4 |
| <i>Russian Federation</i> | 40 | 3.0 | Korea, Republic of | 23 | 5.4 |
| Puerto Rico | 40 | 4.8 | Chile | 23 | 3.3 |
| Hungary | 40 | 3.6 | <i>Peru</i> | 22 | 4.3 |
| Slovak Republic | 39 | 4.6 | <i>Colombia</i> | 19 | 3.5 |
| Portugal | 39 | 2.7 | <i>Albania</i> | 15 | 4.0 |
| Italy | 39 | 2.6 | | | |
| Czech Republic | 39 | 3.7 | Education systems under the U.S. PISA national center | | |
| <i>Argentina</i> | 38 | 3.6 | <i>Massachusetts</i> | 32 | 4.2 |
| Austria | 37 | 5.0 | <i>Florida</i> | 22 | 5.0 |
| <i>Kazakhstan</i> | 37 | 2.9 | <i>Connecticut</i> | 22 | 4.1 |
| Switzerland | 36 | 2.6 | | | |

NOTE: Education systems are ordered by female-male difference in 2012 average score. Differences were computed using unrounded numbers. Scores are reported on a scale from 0 to 1,000. The OECD average is the average of the national average differences of the OECD member countries, with each country weighted equally. The Latin America average is the average of the national average differences of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Italics indicate non-OECD countries and education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Table C-16. Standard errors for figure 7: Profile of the top 10 percent of students in Puerto Rico in mathematics literacy, by various demographic categories: 2012

| Category | Percentage | s.e. | Difference | s.e. of difference |
|--------------------------|------------|-------|------------|--------------------|
| Sex | | | | |
| Male | 44.2 | 4.16 | | |
| Female | 55.8 | 4.16 | -11.5 | 8.32 |
| Public/Private | | | | |
| Public | 42.0 | 8.27 | | |
| Private | 58.0 | 8.27 | -16.0 | 16.54 |
| Urbanicity | | | | |
| Large | 23.2 | 12.48 | | |
| Small/medium | 76.8 | 12.48 | -53.6 | 24.96 |
| Pre-school attendance | | | | |
| Pre-school attendance | 78.1 | 3.63 | | |
| No pre-school attendance | 20.9 | 3.75 | 57.2 | 7.30 |

NOTE: The categories for urbanicity were derived from a question in the school questionnaire asking principals to categorize the size of the community in which their school was located. A large population is defined as 100,000 people or more and a small/medium population is defined as less than 100,000 people. Standard error is noted by s.e. Detail may not sum to totals because of nonresponse to questionnaire items.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment.



Table C-17. Standard errors for figure 8: Average scores of Puerto Rico and Latin America 15-year-old students on PISA mathematics literacy scale, by top and bottom quarters of select indices: 2012

| | ESCS | | Quality of resources | | Quality of infrastructure | |
|--|-------|------|----------------------|------|---------------------------|------|
| | Score | s.e. | Score | s.e. | Score | s.e. |
| Puerto Rico | | | | | | |
| Top quarter | 416 | 7.5 | 418 | 12.0 | 397 | 10.2 |
| Mean | 382 | 3.6 | 382 | 3.6 | 382 | 3.6 |
| Bottom quarter | 357 | 3.8 | 364 | 8.4 | 361 | 8.0 |
| Interquartile score difference | 59 | 8.4 | 54 | 15.6 | 35 | 15.9 |
| Latin America average | | | | | | |
| Top quarter | 446 | 1.8 | 429 | 2.8 | 428 | 3.9 |
| Mean | 397 | 1.2 | 397 | 1.2 | 397 | 1.2 |
| Bottom quarter | 358 | 1.2 | 370 | 1.8 | 374 | 1.9 |
| Interquartile score difference | 88 | 2.0 | 58 | 3.3 | 54 | 4.2 |
| Difference between Latin America average and Puerto Rico interquartile score differences | -30 | 8.6 | -4 | 15.9 | -19 | 16.5 |

NOTE: Interquartile score differences are presented for the PISA index of economic, social, and cultural status (ESCS), the index of quality of schools' educational resources, and the index of quality of schools' physical infrastructure. Details on these indices can be found in appendix A. The Latin America average is the average of the national averages of the Latin America countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay, with each country weighted equally. Standard error is noted by s.e. Scores are reported on a scale from 0 to 1,000.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012.



Table C-18. Standard errors for table 10: Average scores of 15-year-old students on PISA mathematics literacy scale for Puerto Rico students and U.S. Hispanic students, by various subgroups: 2012

| Reporting groups | Puerto Rico | | U.S. Hispanic | | Puerto Rico-U.S. Hispanic difference |
|---|---------------|------|---------------|------|--------------------------------------|
| | Average score | s.e. | Average score | s.e. | Score difference |
| Overall average | 382 | 3.6 | 455 | 4.8 | -73 |
| Sex | | | | | |
| Female | 377 | 3.5 | 450 | 5.1 | -73 |
| Male | 387 | 4.4 | 460 | 5.7 | -73 |
| Public/Private | | | | | |
| Public | 370 | 2.6 | 455 | 4.9 | -85 |
| Private | 424 | 8.7 | 477 | 19.6 | -53 |
| Percentage of public school students eligible for free or reduced-price lunch | | | | | |
| Less than 50 percent | 399 | 3.2 | 495 | 5.7 | -96 |
| 50 percent or more | 369 | 2.7 | 441 | 6.0 | -72 |

NOTE: Scores are reported on a scale from 0 to 1,000. U.S. students who identified themselves as being of Hispanic origin were classified as Hispanic, regardless of their race. The National School Lunch Program provides free or reduced-price lunch for students meeting certain income guidelines. The percentage of students receiving such lunch is an indicator of the socioeconomic level of families served by the school. Free or reduced-price lunch data are for public schools only. Free or reduced-price lunch data in this table are based on principals' responses to a question in the school questionnaire that asked the approximate percentage of eligible students in the school during the previous school year. Standard error is noted by s.e.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment, 2012.

Appendix D: Online Resources and Publications

Online Resources

The OECD website (<http://www.oecd.org/pisa>) provides background information on PISA, including how PISA is different from other assessments, what PISA involves, and additional PISA initiatives. It also provides copies of key findings from all years of PISA, in-depth reports, methodology reports, and manuals (see select OECD PISA Publications below). Test questions, databases, and the assessment frameworks are also available for download at the OECD website.

The NCES website (<http://nces.ed.gov/surveys/pisa>) provides background information on PISA from a U.S. perspective, copies of NCES publications that relate to PISA, released assessment items, and U.S. data files.

OECD PISA Publications

The following publications are intended to serve as examples of some of the numerous reports that have been produced in relation to PISA by OECD. All of the publications listed here are available at <http://www.oecd.org/pisa>.

PISA 2012 Assessment and Analytical Framework

Organization for Economic Cooperation and Development (OECD). (2013). *PISA 2012 Assessment Framework – Key Competencies in Reading, Mathematics and Science*. Paris: Author. <http://www.oecd.org/pisa/pisaproducts/pisa2012draftframeworks-mathematicsproblem-solvingandfinancialliteracy.htm>

PISA 2012 Achievement Reports

Organization for Economic Cooperation and Development (OECD). (2013). *PISA 2012 Results: What Students Know and Can Do – Student Performance in Mathematics, Reading, and Science (Volume I)*. Paris: Author. <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-i.htm>

Organization for Economic Cooperation and Development (OECD). (2013). *PISA 2012 Results: Excellence through Equity – Giving Every Student the Chance to Succeed (Volume II)*. Paris: Author. <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-ii.htm>

Organization for Economic Cooperation and Development (OECD). (2013). *PISA 2012 Results: Ready to Learn: Students' Engagement, Drive and Self-Beliefs (Volume III)*. Paris: Author. <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-iii.htm>

Organization for Economic Cooperation and Development (OECD). (2013). *PISA 2012 Results: What Makes Schools Successful? – Resources, Policies, and Practices (Volume IV)*. Paris: Author. <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-iv.htm>

PISA 2009 Achievement Reports

Organization for Economic Cooperation and Development (OECD). (2010). *PISA 2009 Results: What Students Know and Can Do – Student Performance in Reading, Mathematics, and Science (Volume I)*. Paris: Author. <http://www.oecd.org/pisa/pisaproducts/pisa2009resultswhatstudentsknowandcandostudentperformanceinreadingmathematicsandsciencevolumei.htm>

Organization for Economic Cooperation and Development (OECD). (2010). *PISA 2009 Results: Overcoming Social Background: Equity in Learning Opportunities and Outcomes (Volume II)*. Paris: Author. <http://www.oecd.org/pisa/pisaproducts/pisa2009resultsovercomingsocialbackgroundequityinlearningopportunitiesandoutcomesvolumeii.htm>

Organization for Economic Cooperation and Development (OECD). (2010). *PISA 2009 Results: Learning to Learn (Volume III)*. Paris: Author. <http://www.oecd.org/pisa/pisaproducts/pisa2009resultslearningtolearnvolumeiii.htm>



Organization for Economic Cooperation and Development (OECD). (2010). *PISA 2009 Results: What Makes a School Successful? Resources, Policies, and Practices (Volume IV)*. Paris: Author. <http://www.oecd.org/pisa/pisaproducts/pisa2009resultswhatmakesaschoolsuccessfulvolumeiv.htm>

Organization for Economic Cooperation and Development (OECD). (2010). *PISA 2009 Results: Learning Trends: Changes in Student Performance Since 2000 (Volume V)*. Paris: Author. <http://www.oecd.org/pisa/pisaproducts/pisa2009resultslearningtrendschangesinstudentperformancesince2000volumev.htm>

PISA 2006 Achievement Reports

Organization for Economic Cooperation and Development (OECD). (2007). *PISA 2006: Science Competencies for Tomorrow's World (Volume 1: Analysis)*. Paris: Author. <http://www.oecdbookshop.org/oecd/display.asp?lang=EN&sf1=identifiers&st1=9789264040007>

Organization for Economic Cooperation and Development (OECD). (2007). *PISA 2006 (Volume 2: Data)*. Paris: Author. <http://www.oecdbookshop.org/oecd/display.asp?lang=EN&sf1=identifiers&st1=9789264040144>

PISA 2003 Achievement Reports

Organization for Economic Cooperation and Development (OECD). (2004). *Learning for Tomorrow's World: First Results from PISA 2003*. Paris: Author. <http://www.oecd.org/edu/school/programmeforinternationalstudentassessmentpisa/34002216.pdf>

PISA 2000 Achievement Reports

Organization for Economic Cooperation and Development (OECD). (2001). *Knowledge and Skills for Life: First Results from OECD Programme for International Student Assessment (PISA) 2000*. Paris: Author. <http://www.oecd.org/fr/education/scolaire/programmeinternationalpourlesuividesacquisdeselevespisa/knowledgeandskillsforlifefirstresultsfrompisa2000-publications2000.htm>

PISA In-Depth Reports

Organization for Economic Cooperation and Development (OECD). (2012). *Public and Private Schools: How Management and Funding Relate to their Socio-economic Profile*. Paris: Author. <http://www.oecd.org/edu/school/programmeforinternationalstudentassessmentpisa/publicandprivateschoolshowmanagementandfundingrelatetotheirsocio-economicprofile.htm>

Organization for Economic Cooperation and Development (OECD). (2012). *Let's Read Them a Story! The Parent Factor in Education*. Paris: Author. <http://www.oecd.org/edu/school/programmeforinternationalstudentassessmentpisa/pisa-letsreadthemastorytheparentfactorineducation.htm>

Organization for Economic Cooperation and Development (OECD). (2013). *Strong Performers and Successful Reformers in Education – Lessons from PISA 2012 for the United States*. Paris: Author. <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-united-states.htm>