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For on-going testing in the United States, we extend our special thanks to the William and Flora Hewlett Foundation, the Kern Family Foundation and America Achieves for all of their support and leadership.

This school report is based primarily on data and project co-ordination provided by NWEA™. As an accredited service provider and platform provider for the online OECD Test for Schools, NWEA transitioned the paper and pencil test to a web-based test and conducted the test administration, coding, scoring, scaling and data management and provided the analytical outputs that comprise the school reports.

The development of the OECD Test for Schools (based on PISQoa on PE .204Eo/(T)100 (est for Sc)18 (hools (bgu (

Figure 5.3 Student performance within your school and within schools in selected countries and economies in reading, mathematics and science according to socio-economic status 97
Figure 5.4 How girls and boys perform in reading, mathematics and science within your school and within-schools in other countries and economies 100

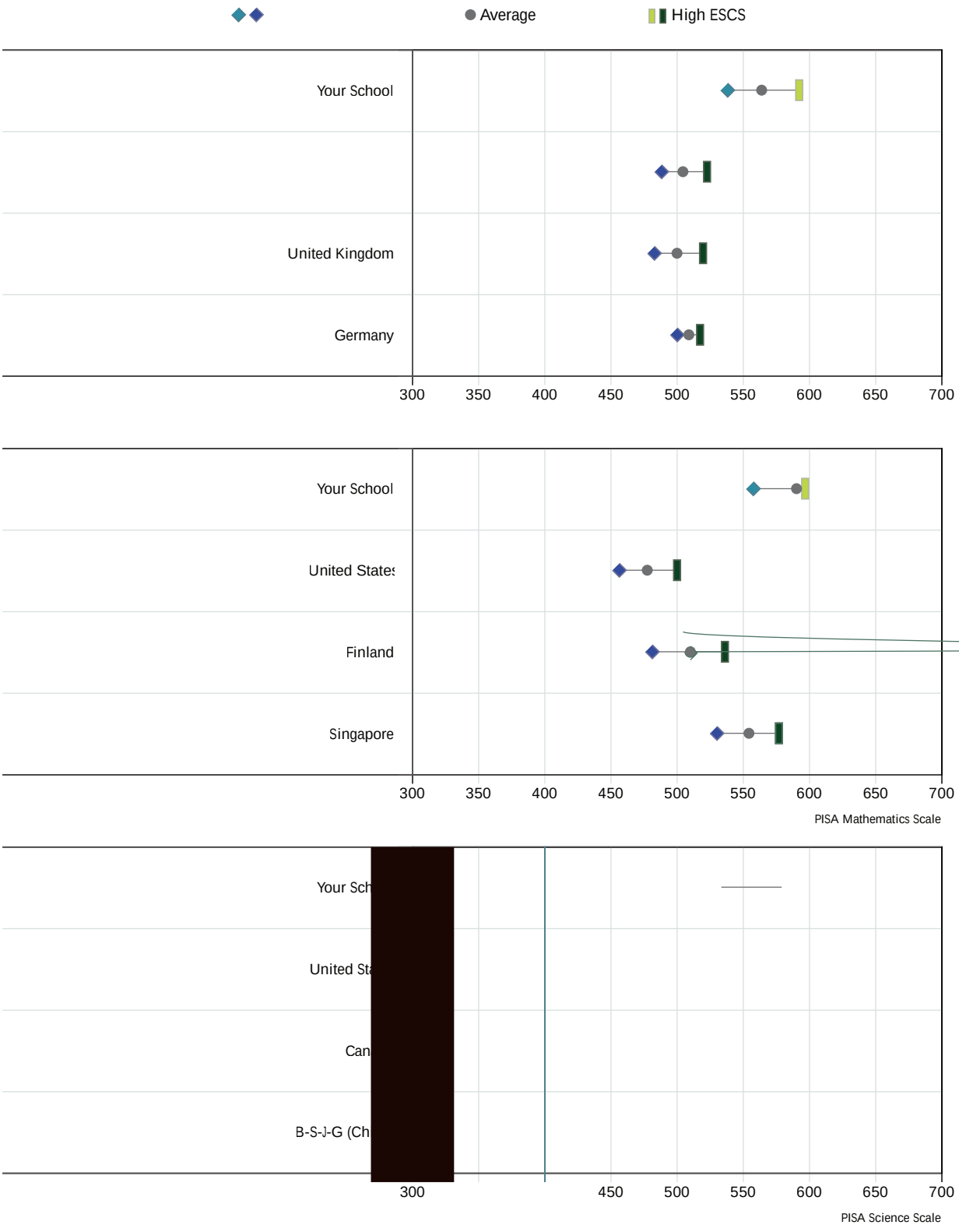
TABLES

Table 1 Mean score and variation in mathematics performance in PISA 2015 122
Table 2 Percentage of students at each pro□ciency level in mathematics in PISA 2015 123
Table 3 Mean score and variation in mathematics performance, by gender in PISA 2015 124
Table 4 Mean score and variation in reading performance in PISA 2015 127
Table 5 Percentage of students at each pro□ciency level in reading in PISA 2015 128
Table 6 Mean score and variation in reading performance, by gender in PISA 2015 129
Table 7 Mean score and variation in science performance in PISA 2015 132
Table 8 Percentage of students at each pro□ciency level in science in PISA 2015 133
Table 9 Mean score and variation in science performance, by gender in PISA 2015 134
Table 10 Low achievers in science, reading and mathematics in PISA 2015 137
Table 11 Top performers in science, reading and mathematics in PISA 2015 138
Table 12 Socio-economic status of students in PISA 2015 139

Excellence and equity

When interpreting your school's results, it is important to consider the influence that socio-economic background has on learning outcomes. Compared with other schools in the United States, students at your school have socio-economic backgrounds [illegible]. In this report you will see how your school compares with other schools in the United States and internationally

Figure F ■ **Student performance within your school and within selected countries and economies in reading, mathematics, and science according to socio-economic status**



N. . : Within each school, country, or economy shown above, darker colored markers indicate that the difference between the high and low markers is statistically significantly different from one another.

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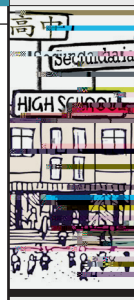

Understanding the differences between your school assessment and the main PISA studies

Although the [illegible] is developed from the same assessment frameworks as the main PISA ([illegible]) studies organized every three years by the OECD, the two assessments are different. The OECD created the original PISA assessment in response to its member countries' demands for regular and reliable data on the knowledge and skills of their students and the performance of their education systems in an international context. While the PISA assessment is intended to provide aggregate national results for international comparisons and to inform policy discussions, the [illegible] is designed to provide school-level results for benchmarking and school-improvement purposes.

Sources of school information and data

The accredited service provider in the United States and partner for this cycle of testing, NWEA, organized the assessment with participating schools. The students tested at your school responded to approximately two hours of test questions and provided answers to a 30-minute student questionnaire. In addition, the principal(s) or designated officials of your school provided information on your school's characteristics by completing a school questionnaire.

Other sources of information presented in the report

This report presents information, results and findings from various OECD sources. Primarily, it is based on the [illegible] and results from past PISA cycles. Most of the international comparisons between your school's results and PISA results combine both of these sources. In addition, the report presents findings and information gleaned from PISA over the years as well as recent OECD research and resources on successful education systems, increasing equity and improving schools.

Data underlying the □gures

Because of the nature of the assessment that your school participated in, your school's results will not be made available publicly. The results for your school and others participating in the assessment are confidential. The data for those figures where "countries that participated in past PISA cycles" are cited can be found in the reports of previous PISA cycles. As a reference point for the most recent PISA cycle in 2015, an overview of results for all countries and economies that participated in 2015 is presented as an annex to this report.

Focusing on statistically signi□cant differences

This report discusses differences or changes that are statistically significant and, in some cases, results that are not statistically significant. Differences that are statistically significant are clearly indicated.

As a rule, PISA reports differences with a 95% confidence threshold, and this convention has been followed in this report. This refers to the fact that, if the measurement were to be replicated several times, a difference of that size, smaller or larger, would be observed less than 5% of the time if there were actually no difference in corresponding population values.

standard error; however, even if a school tests all of its 15-year-olds, the standard error will not be eliminated as there will still be measurement and equating error. All standard errors in this report have been rounded to one decimal place. Thus, where the value 0.0 is shown, this does not imply that the standard error is zero, but that it is smaller than 0.05.

Con□dence intervals

Whenever mean results for your school or for subgroups of students within your school are presented graphically in this report, you will notice a shaded bar above and below the marker for your school. The bar indicates the statistical uncertainty (or "confidence interval") associated with the result. In technical terms, the error bar represents a 95% certainty with which your school's result is estimated to lie within the error bars, were the test to be replicated several times with different student samples from your school.

A note on statistical concepts and terminology for meaningful comparisons

The reader will find several statistical concepts and terms used throughout the school report. As with any estimate or measurement, there is a certain degree of uncertainty. The degree of error is associated with the scores describing student performance in reading, mathematics and science, for example, as these scores are estimated based on student responses to test items. As described earlier, a statistic called the standard error (S.E.) is used to express the degree of uncertainty associated with sampling, measurement and equating error. The standard error can be used to construct a confidence interval, which provides a means of making inferences about the population averages and proportions in a manner that reflects the uncertainty associated with sample estimates. A 95% confidence interval is used in this report and represents a range of plus or minus about two standard errors around the sample average. Using this confidence interval, it can be inferred that the population mean or proportion would lie within the confidence interval in 95 out of 100 replications of the measurement, using different samples randomly drawn from the same population.

When comparing scores among countries, economies, provinces or groups of schools, the degree of error in each average must be considered in order to determine if the true population averages are likely different from each other. Standard errors and confidence intervals may be used as the basis for performing these comparative statistical tests. Such tests can identify, with a known probability, whether there are actual differences in the populations being compared.

For example, when an observed difference is significant at the 0.05 level, it implies that the probability is less than 0.05 that the observed difference could have occurred because of error from sampling, measurement or linking. Only statistically significant differences at the 0.05 level are noted in this report, unless otherwise stated. Values are considered statistically significantly different if their confidence intervals do not overlap.

Reproduced and edited from Brochu, P., T. Gluszynski and T. Knighton, Measuring Up: Canadian Results of the OECD PISA Study: The Performance of Canada's Youth in Reading, Mathematics and Science, Minister of Industry, Canada, 2010.

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Your school's results from the PISA for Schools are comparable to PISA, using the same frameworks and scaling. And like the international PISA, the PISA for Schools measures 15-year-old students' applied knowledge and competencies in reading, mathematics and science. The assessment seeks not only to determine whether students can reproduce knowledge, but also examine how well they can extrapolate from what they have learned and apply it in unfamiliar settings, both within and outside of school.

However, while the international PISA assessment is intended to provide aggregate national results for international comparisons and to inform policy discussions, the PISA for Schools is designed to provide school-level results for benchmarking and school-improvement purposes.

This report presents your school's results from the PISA for Schools. It allows you to compare your students' levels of proficiency in reading, mathematics and science with the levels of other students in your country and in school systems around the world. The results can be used as a gauge of how prepared students at your school are to succeed in a global economy. This report will also provide you with examples of school practices from countries and economies that have shown consistently high results and made considerable progress due to school-improvement efforts and educational reforms.

What the OECD Test for Schools measures and how

The PISA for Schools follows the internationally recognized assessment frameworks used in the PISA studies. The frameworks were developed by international experts and are updated continuously to reflect subject matter developments and progress in assessment methods (see Box 1.2). The frameworks are based on the concept of literacy, which includes students' capacity to extrapolate from what they have learned and apply their knowledge and skills in real-life settings, as well as their capacity to analyze, reason and communicate effectively as they pose, interpret and solve problems in a variety of situations.

Box 1.2 An Introduction to the PISA Assessment Frameworks

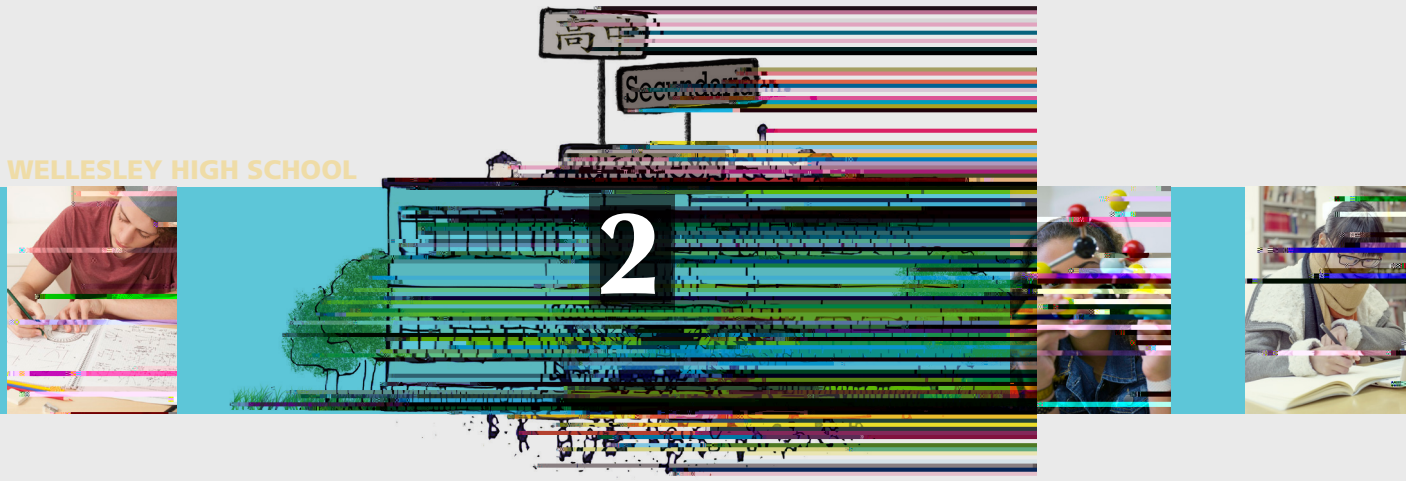
The PISA frameworks establish the conceptual foundation for what the assessment measures. They focus on students' capacity to analyze, reason and communicate effectively as they pose, solve and interpret problems in a variety of situations. Age 15 is chosen as the target population of PISA because at this age students are approaching the end of compulsory education in most OECD and many non-OECD countries and economies.

The PISA assessment frameworks define competence as far more than the capacity to reproduce accumulated knowledge. According to PISA, competence is the ability to successfully meet complex demands in varied contexts through the mobilization of psychosocial resources, including knowledge and skills, motivation, attitudes, emotions and other social and behavioral components. Rather than assessing whether students can reproduce what they have learned, PISA measures whether students can extrapolate from what they have learned and apply their competencies in novel situations. Tasks that can be solved through simple memorization or with pre-set algemolvTTe ten-GO20 79.3698 10.087g8re-sypnd th

In PISA and the PISA 2009 assessment, students are presented with stimulus material, such as texts, diagrams, tables and/or graphs, which are followed by questions about the material. The questions are constructed such that required tasks closely resemble what students might encounter in everyday life. The PISA 2009 assessment contains 47 questions in reading, 40 in mathematics and 54 in science. Example questions developed for the test are included in Annex C, and you can see all of the publicly available PISA questions online.

Test questions vary in format. Around half require students to construct their own responses. Some require a short answer. Others allow for more varied individual responses and require students to justify their viewpoints. The other half of questions are multiple-choice items for which students select either one choice among four or five alternatives or select one of two possible responses ("yes"/"no" or "agree"/"disagree") to a series of propositions or statements. The questions are grouped into seven booklets that each requires up to 120 minutes of testing time. Each booklet includes a selection of questions, such that

Section 3, The Learning Environment and Student Engagement at Your School, describes your school's classroom disciplinary climate, its teacher-student relations and students' attitudes towards learning as reported in the contextual questionnaires. The section shows how these elements are related to student



What Students at Your School Know and Can Do in Reading, Mathematics and Science

This section provides an overview of your school's performance on the *OECD Test for Schools*. It focuses on the distribution of the highest- and lowest-performing students at your school and the kinds of tasks that they can perform in each domain.

Figure 2.2 ■ **How your school's results in reading compare with schools in the United States in PISA 2015**

N. . : Size of the dot is proportional to the number of students enrolled at the school.

The diagonal line on each figure indicates the relationship between socio-economic background and performance. Schools well above the diagonal line perform better than what would reasonably be expected given the socio-economic status of their students while those well below do not perform as well as what would reasonably be expected.

There are also two shaded areas in each figure. The horizontal shaded area represents the confidence interval around your school's score on the PISA scale for a specific domain. The vertical shaded area represents the confidence interval around your school's value on the ESCS index. Where they overlap represents the area in which your school's results would be expected to be 95% of the time if the OECD Test for Schools were administered continuously in your school.

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Figure 2.5 ■ **The six levels of reading proficiency in PISA[1]**

Level	Lower score limit on PISA scale	What students can do at this level of proficiency
-	698	Students at proficiency Level 6 are highly skilled readers. They can conduct fine-grained analyses of texts, which require detailed comprehension of both explicit information and unstated implications, and they can reflect on and evaluate what they read at a more general level. Students at this level have successfully completed most of the tasks presented to them in the reading assessment, demonstrating that they are capable of dealing with many different types of reading material. Hence, they are diversified readers who can assimilate information from unfamiliar content areas presented in atypical formats, as well as being able to engage with more familiar content with typical structures and text features. Another characteristic of the most highly developed readers is that they can overcome preconceptions in the face of new information, even when that information is contrary to expectations. Students at this level are capable of recognizing what is provided in a text, both conspicuous and more subtle information, while being able to apply a critical perspective to it, drawing on sophisticated understanding beyond the text.
	626	Students at proficiency Level 5 can handle texts that are unfamiliar in either form or content. They can find information in such texts, demonstrate detailed understanding and infer which information is relevant to the task. They are also able to critically evaluate such texts and build hypotheses about them, drawing

Figure 2.6 shows the distribution of students at your school in the six proficiency levels in reading, compared with students in the United States in PISA 2015. If the bars are striped, the distribution of students at your school is statistically significantly different from that of the United States. If the bars are solid, the distribution is not statistically significantly different.

In the United States, 10% of students perform at or above Level 5 in reading, while 18% of students in Singapore perform at these highest levels. The kinds of tasks that students at Levels 5 and 6 are capable of doing suggest that those who reach Level 5 or above can be regarded as potential "world-class" knowledge workers of tomorrow.

Figure 2.6 ▪ **How proficient are students at your school in reading compared with students in the United States in PISA 2015**

N. . : Striped bars are an indication that the distribution of students in proficiency levels at your school is statistically significantly different from the distribution of students in United States. Solid bars are an indication that the distribution of students in proficiency levels at your school is not statistically significantly different from the distribution of students in United States.

In contrast, 19% of 15-year-olds in the United States do not reach Level 2 of reading proficiency. As described earlier, Level 2 is the baseline level at which students begin to demonstrate reading competencies that will enable them to participate effectively and productively as students, as workers and citizens. In the highest-performing countries and economies, such as Hong Kong (China) and Ireland in PISA 2015, the proportion of students who do not reach this level is around 10%.

A Canadian study that followed students who were assessed by PISA in 2000 showed that students who do not reach Level 2 face high risks of not completing post-secondary education and having difficulties in the labor market at age 19 and age 21. For example, more than 60% of students who performed below Level 2 in PISA 2000 had not received any post-school education by age 21 (see Box 2.2).

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Figure 2.8 ▪ **How proficient are students at your school in mathematics compared with students in the United States in PISA 2015**

N. . : Striped bars are an indication that the distribution of students in proficiency levels at your school is statistically significantly different from the distribution of students in the United States. Solid bars are an indication that the distribution of students in proficiency levels at your school is not statistically significantly different from the distribution of students in the United States.

About 21% of students in the United States score at or above proficiency Level 4 in mathematics – the level at which students can solve problems that involve visual and spatial reasoning, compared with the OECD average of 29%. In the highest-performing countries and economies, such as Singapore and Hong Kong (China), over 50% of students perform at Level 4 or higher. In the lowest-performing countries and economies in mathematics – the Dominican Republic and Kosovo – fewer than 1% of students reach Level 4 or higher.

At the other end of the scale, 29% of students in the United States do not reach the baseline Level 2 in mathematics – the level of proficiency at which students begin to demonstrate the kinds of skills that enable them to use mathematics in ways that are considered fundamental for their future development. Among these, 11% do not reach Level 1, while 19% reach Level 1 but not Level 2. In comparison, 7% of students from Macao (China) do not reach Level 2, while 91% of students from the Dominican Republic do not reach Level 2. Students who score below Level 1 (358 score points) cannot complete the most basic mathematical tasks from PISA and the P. ,.,.,. .. ,.

What students at your school know and can do in science

Unlike many traditional assessments of student performance in science, PISA and the P. ,.,.,. .. , do not focus on measuring students' mastery of specific science content. Rather, they measure the capacity of students to engage with science-related issues and to think like a scientist. To provide a better understanding of the type of tasks used to assess students' science competencies, a selection of sample tasks has been included in Annex C. See also Sample Items from the P. ,.,.,. .. ,.

As with reading and mathematics, depending on the science tasks that they can successfully complete, students can be grouped into different levels of science proficiency. Figure 2.9 presents short descriptions of what students are expected to know and be able to do at each level of science proficiency. Level 2 has been established as the baseline level of science proficiency. It defines the level of achievement at which students begin to demonstrate the science competencies that will enable them to participate actively in real-life situations related to science and technology. Students with a score between 484 and 558 are proficient at Level 3. Students with a score of 708 and above are proficient at Level 6, while students with a score below 335 do not reach Level 1. Students below Level 1 usually cannot perform the most basic science tasks from PISA and the P. ,.,.,. .. ,.

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Figure 2.10 ■ **How proficient are students at your school in science compared with students in the United States in PISA 2015**

N . : Striped bars are an indication that the distribution of students in proficiency levels at your school is statistically significantly different from the distribution of students in United States. Solid bars are an indication that the distribution of students in proficiency levels at your school is not statistically significantly different from the distribution of students in United States.

Box 2.3 High autonomy combined with high accountability: Lessons from Estonia

PISA results suggest that when autonomy and accountability are intelligently combined, they tend to be associated with better student performance. At the country level, the greater the number of schools that autonomously define and elaborate their curricula and assessments, the better the performance of the entire school system, even after accounting for national income. Systems that grant schools greater discretion in deciding student-assessment policies, courses offered, the content of those courses and textbooks used are also those systems that show higher reading scores overall. In addition, PISA results show that school systems where most schools post achievement data publicly, average student performance is marginally higher in those schools that have autonomy over resource allocation.

Schools in Estonia have autonomy above the OECD average, including the capacity to make decisions on the curriculum, resource allocation and hiring and dismissing teaching staff. The high level of autonomy allows each school to decide its own way of teaching, the content taught, and the selection, remuneration and training of the teachers. Local schools also have high autonomy in the design, implementation, modification and improvement of curriculum in collaboration with a school's board of trustees, students, teachers and parents. Each school is allowed to use its own assessment and grading system on the condition that they are convertible to the national five-point scale. Under the discretion of schools, teachers can be awarded monetarily for additional work and for effective results. This high autonomy enjoyed by schools goes hand-in-hand with school accountability and in turn, high levels of autonomy go hand-in-hand with rigorous state regulation.

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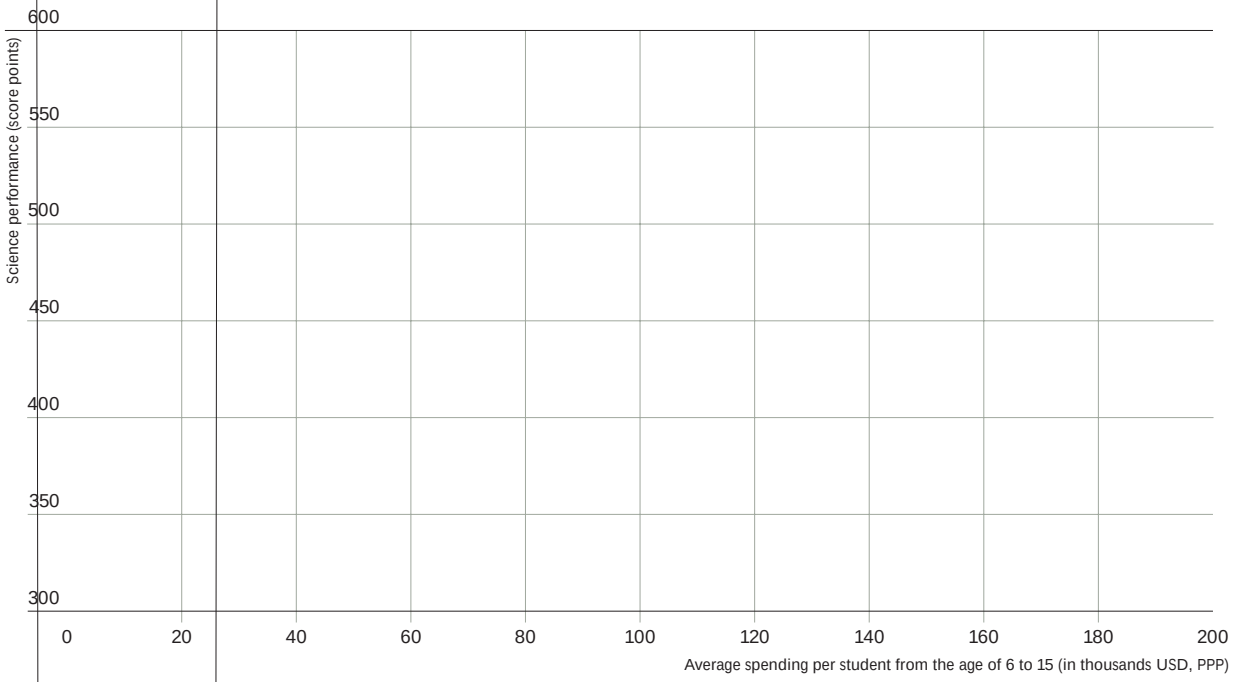
600
550
500
450
400
350
300
Science performance (score points)
0
20
40
60
80
100
120
140
160
180
200
Average spending per student from the age of 6 to 15 (in thousands USD, PPP)

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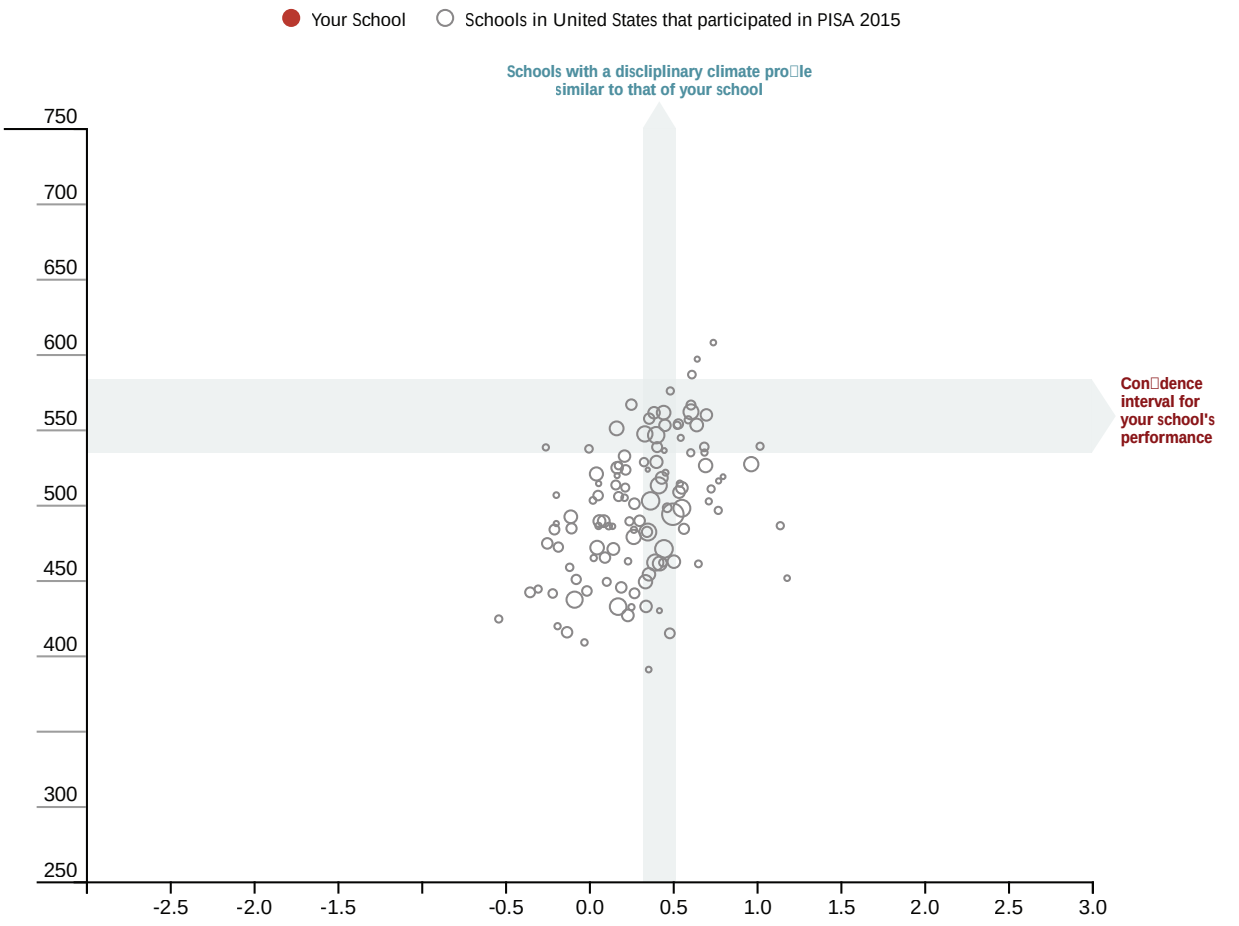
Figure 3.2 ■ **Classroom disciplinary climate in science lessons and science performance at your school in the United States in PISA 2015**



N : Size of the dot proportional to the number of students enrolled at the school.

In this figure the students' responses to the five questions shown in Figure 3.1 have been converted to an index score. The the score on this scale, the more the classroom disciplinary climate at the school. This is represented by the horizontal axis on the figure. Thus, the further to the right on the figure, the more positive is the classroom disciplinary climate at the school. Your school is represented by a red bubble in the figure, and all other schools in the United States are represented by hollow bubbles.

In the United States in PISA 2015, students, on average, reported a classroom disciplinary climate index in science of 0.3, which is higher than the OECD average of 0.0. A one unit increase in the index of disciplinary climate is associated with a 24 point increase in science performance. This relationship between a student's classroom disciplinary climate and his/her science performance is one of the strongest among all OECD countries.

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Box 3.3 The role of teacher motivation in teacher-student relations

Motivation is a complex construct that can be defined as "the process whereby goal-directed activity is instigated and sustained" (Schunk, Pintrich, & Meece, 2008, p. 4), suggesting that motivation should be inferred from actions such as choices and effort rather than outcomes. In the education context, teacher motivation encompasses many factors including self-efficacy, values, intrinsic orientations and different types of goals.

Many researchers are focusing on learning more about the interplay between teacher-student relations and teacher motivation. For example, Holzberger et al. found a positive correlation between teacher self-efficacy and student-reported instructional practices their teachers engaged in, which encompassed teacher-student relationships (Holzberger, Phillipp, & Kunter, 2014). Another study by Watt and Richardson uncovered links between both teacher abilities and social motivations, with both having high expectations for students and also forming positive relationships with them (Watt & Richardson, 2014). Some evidence suggests that when teachers feel it is their responsibility to establish these positive relationships, students report higher teacher enthusiasm and teachers may be less likely to engage in differential treatment of students, such as prioritizing high-achieving over low-achieving students (Lauerman, 2014).

Past PISA reports underline the importance of these relationships, as positive teacher-student relationships tend to be correlated with student academic as well as emotional outcomes.

To read more about teacher motivation and teacher-student relations, see:

STUDENTS' READING HABITS AND THE RELATIONSHIP WITH PERFORMANCE

PISA results have shown that two factors are closely associated with performance in reading:

- Students who read a wide variety of materials for enjoyment are the most proficient readers. Although students who regularly read fiction tend to be high-performing, those who read a wider variety of materials for enjoyment achieve the highest scores in PISA. To assess this factor:
- Students who are highly aware of the most effective learning strategies to understand, remember and summarize information are more proficient readers than those students with low levels of effective learning strategies. To assess this factor:

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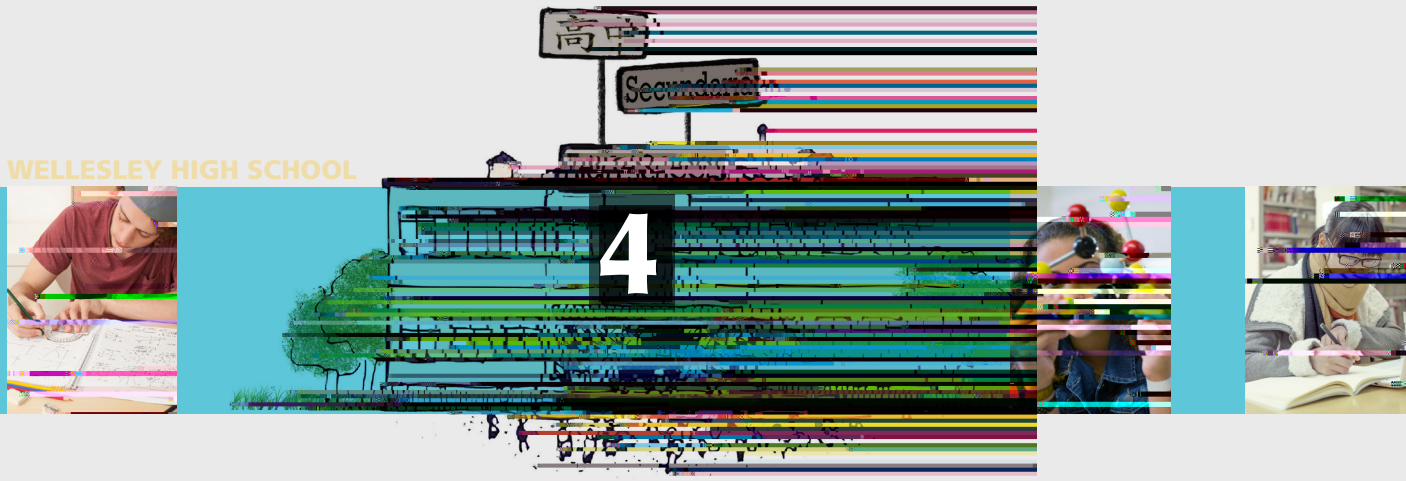

Your School's Results in an International Context

This section places your school's performance in the context of countries and economies from around the world. Examples of how education systems have addressed low performance and fostered the talent of students are included throughout this section.

Although the above figure shows overall student performance, large variations of student performance exist behind these average scores. Thus, to make meaningful comparisons using your school's reading performance, it is also useful to look at how your school compares with different groups of schools internationally.

In Figure 4.2, your school's mean score is again presented on the PISA reading scale along with a 95% confidence interval. To the right, the performance of groups of schools that participated in PISA 2015 from the United States, Germany and the United Kingdom are presented.

For each comparison country or economy, five horizontal markers show how different groups of schools performed. The first marker at the top of each scale shows the cut-off score above which the top 10% of students in schools in that country performed.[1] The second marker from the top of the scales represents the score above which the top 25% of students in schools performed.

The third marker for each of the scales shows the average score in a country or economy. The two lower markers for each country represent the points above which 75% and 90% of students in schools perform, respectively. Given the differences in student performance between Germany and the United Kingdom, your school's mean scores will correspond to very different percentiles of performance within these countries and economies.

1. In this and other references to a specific percentage of students in schools, the number of schools is weighted by the number of enrolled students at those schools. In other words, the group of schools is composed of the top schools that, in total, enroll a specified percentage of the student population from a country or economy. For example, the top 10% of students in schools is composed of the top performing schools that, together, account for 10% of the student population of a country or economy.

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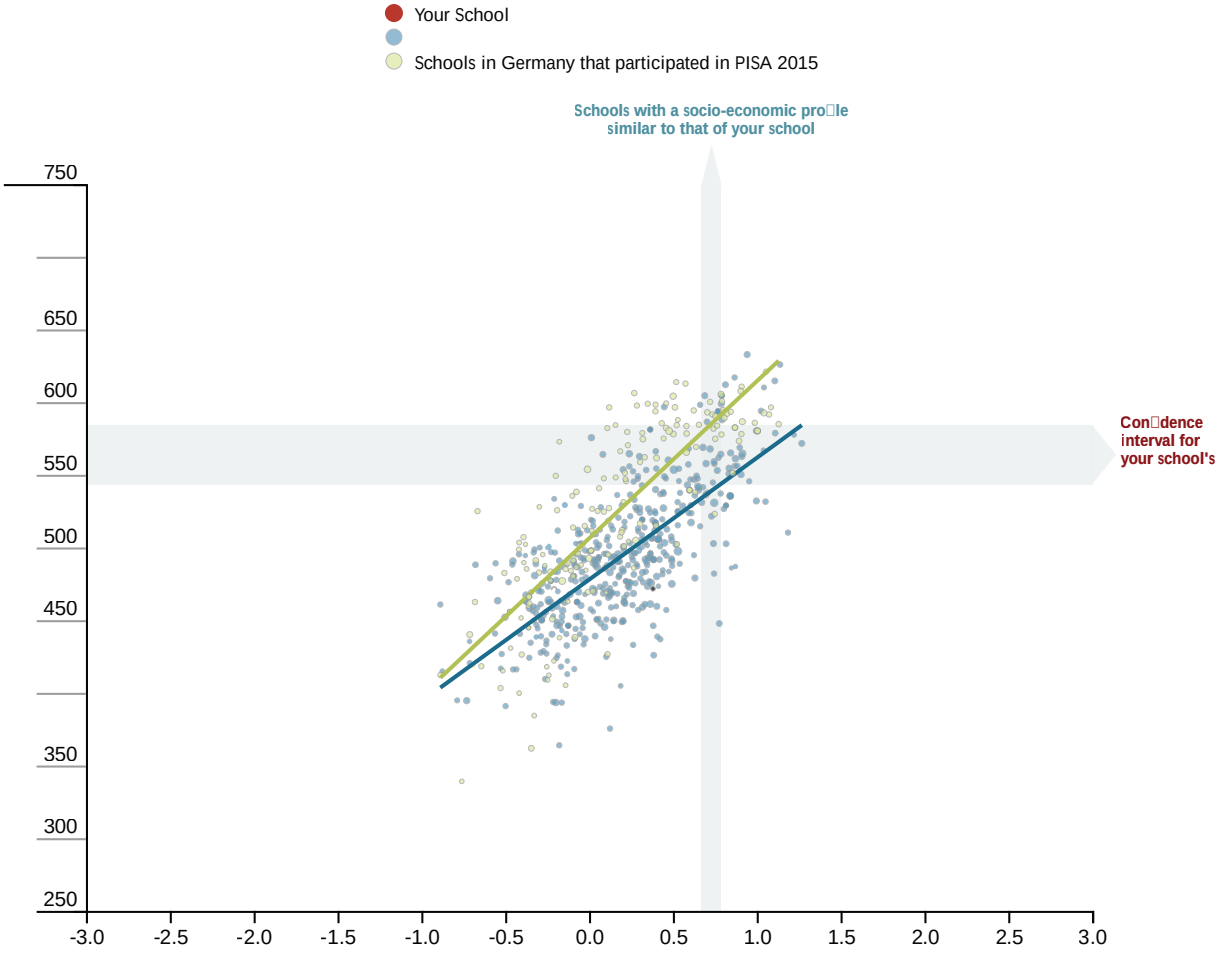
The next figure locates your school's performance in the context of individual schools from other countries and economies in PISA 2015. Each bubble represents one school. Similar to the charts from Section 2 of this report, the scale on the left side of the figure (the y-axis) represents performance on the PISA reading scale. The scale on the bottom (the x-axis) of the figure refers to the socio-economic status of students as measured by the PISA index of economic, social and cultural status (ESCS). The scale shows average index

Figure 4.3 ■ **How your school's results in reading compare with schools in the United Kingdom and Germany in PISA 2015**



N. . : Size of the dot is proportional to the number of students enrolled at the school.

Student performance at your school across reading pro□ciency levels

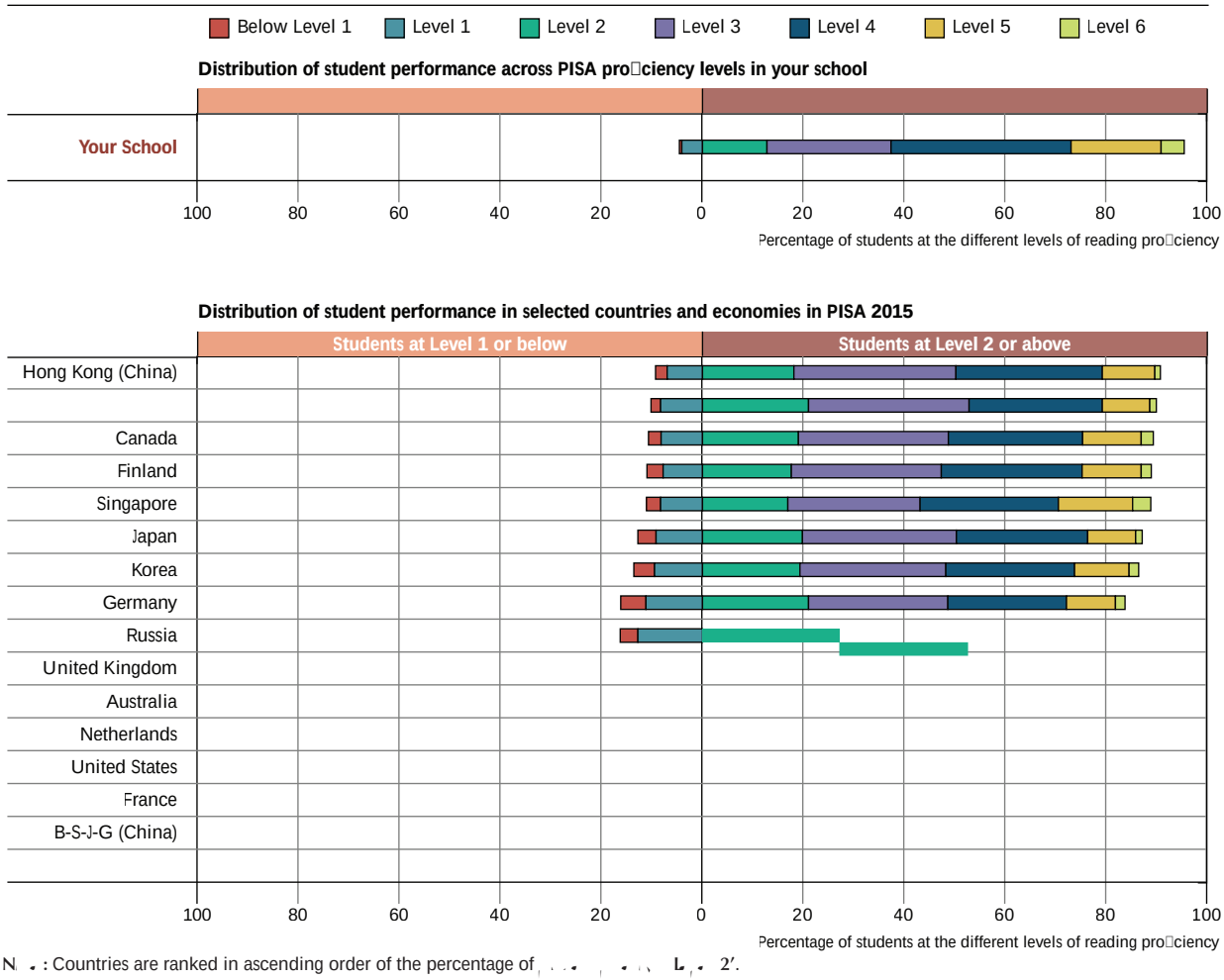
The mean score for your school in reading is based on the average of the students who were tested. It is, however, important to look beyond this mean score and examine the distribution of student performance in your school. The P. ,.,.,. .. , uses the PISA proficiency levels for this purpose.

As discussed previously in Figure 2.5, students who reach proficiency Levels 5 and 6 are well on their way to becoming the skilled knowledge workers of tomorrow. Proficiency Level 2 is considered the baseline level at which students begin to demonstrate the reading skills and competencies that will allow them to participate effectively and productively in life. Students below this level, while not necessarily illiterate, do not show the basic proficiency necessary to ensure their success later in their lives.

Your school's distribution of student performance across proficiency levels is presented in Figure 4.4, which shows the percentage of 15-year-olds at your school who reached each of the six proficiency levels. The figure shows a dark vertical line at the 0% value of the x-axis such that the percentage of students at Level 1 or below is found on the left-hand side and the percentage of students at Level 2 or above is on the right-hand side.

For reference, the lower part of the figure shows the distribution of student performance across reading proficiency levels in selected countries and economies that participated in PISA 2015. Countries and economies in this part of the figure are ranked in ascending order according to the percentage of students below Level 2.

Figure 4.4 ▪ **How the distribution of student performance at your school compares with student performance in selected countries and economies in reading in PISA 2015**



Note: Countries are ranked in ascending order of the percentage of [illegible] Level 2.

Box 4.3 Collaboration and professional development for teachers: Lessons from Japan

Teacher policies and learning opportunities are different around the world. In some countries, teachers are able to benefit from continuous professional development, collaborative learning and sharing on best practices. This can be important for enhancing professional competences, pedagogical knowledge and maintaining motivation and interest in a profession that experiences high rates of burnout and attrition.

In Japan, teachers participate in lesson study, in which groups of teachers review their lessons and look at ways to improve them, in part by analyzing student errors. Lesson study provides one of the most effective mechanisms for teachers' self-reflection as well as being a tool for continuous improvement. Observers of Japanese elementary school classrooms have long noted the consistency

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YOUR SCHOOL'S PERFORMANCE IN MATHEMATICS IN AN INTERNATIONAL CONTE

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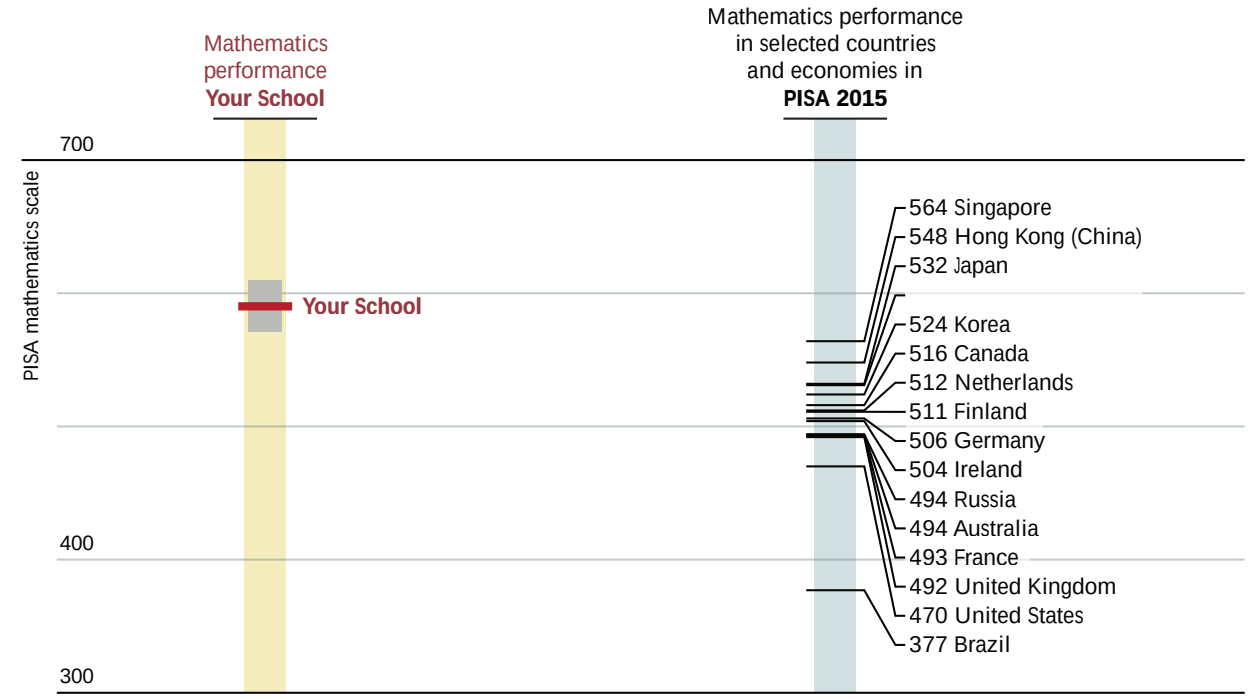
Figure 4.5 ▪ **How students at your school compare with selected countries and economies in mathematics in PISA 2015**



N. . : Shaded bars above and below the mean scores represent a 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance scores would fall within this confidence interval.

In order to contextualize your school's performance, it is useful to compare your school's results with those of groups of schools internationally. In Figure 4.6, your school's mean score is presented on the PISA mathematics scale along with a 95% confidence interval. The performance of groups of schools that participated in PISA 2015 from the United States, Finland and Singapore are presented to the right of your school's results.

As with earlier similar figures, the first markers on the scales show the cut-off scores above which 10% of students in the top schools perform for the particular country or economy. The second markers from the top show the scores above which 25% of students in schools perform for the country or economy. The third marker for each of the scales shows the the average score in a country or economy. The bottom two markers for each country and economy show the points above which 75% and 90% of students in schools perform.

This figure allows you to compare your school's results in mathematics with those of groups of schools in your country and other countries and economies in PISA 2015. Given the differences in student performance between Finland and Singapore, your school's mean scores will correspond to very different percentiles within these entities.

The next figure plots your school's performance in mathematics in the context of schools from other countries and economies. Similar to Figure 4.3, ESCS is shown on the x-axis while performance on a PISA scale, mathematics in this case, is shown on the y-axis. Schools from two countries and economies that participated in PISA 2015 are represented as differently colored bubbles. Diagonal lines represent the relationship between ESCS and mathematics performance for schools in these countries and economies.

How **Your School** performs in mathematics

How schools in the **United States** perform in mathematics in PISA 2015

How schools

700

500

300

The mean score of the United States in mathematics is 470. This is statistically significantly lower than Finland's mean score of 511 and Singapore's mean score of 564, which are also statistically significantly different from each other. As can be seen in the figure, Singapore's schools are, in general, positioned higher on the chart, indicating higher performance.

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Your school's distribution of student performance across proficiency levels in mathematics is presented in Figure 4.8, which shows the percentage of 15-year-olds at your school who reached the six proficiency levels. The figure shows a dark vertical line at the 0% value of the -axis such that the percentage of students

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HIGH SCHOOL

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Figure 4.10

N. ◂ : Shaded bars above and below the mean scores represent a 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance score would fall within this confidence interval.

For example, the legend "10%" refers to the highest performing schools that account for 10% of the total number of students in the country.

The next figure situates your school's performance in science in the context of schools from B-S-J-G (China) and Canada. Similar to Figure 4.3 and Figure 4.7, schools are plotted as bubbles according to their ESCS and score on the PISA science scale. Confidence intervals for your school's ESCS and science score are shown as vertical and horizontal shaded areas, respectively.

The mean score of the United States in science is 496. This is statistically significantly lower than the mean score of B-S-J-G (China), which is 518, and Canada's mean score of 528, which are not statistically significantly different from each other. As can be seen in the figure below, the distribution of schools from B-S-J-G (China) and Canada demonstrate similar overall results. However, B-S-J-G (China)'s schools occupy a broader range in the figure.

Vertically, Canada's schools are clustered more closely together than B-S-J-G (China)'s schools. In other words, Canadian schools have a smaller range of performance in science. These results suggest that Canada has less between-schools variation than B-S-J-G (China) and PISA 2015 data corroborate this conclusion. In Canada, between-schools variation explains 14% of the total variation in science performance. In B-S-J-G (China), between-schools variation explains 63% of the total variation in science performance.

At the student-level, the mean ESCS index in B-S-J-G (China) is -1.1, while the mean ESCS index in Canada is 0.5. This disparity is also reflected at the school-level in the following figure. Schools from B-S-J-G (China) are generally less advantaged than schools in Canada and are thus positioned further to the left on the chart. As mentioned previously, the range of socio-economic status between schools in B-S-J-G (China) is wider than in Canada. Looking to the right side of the chart, the most advantaged schools in B-S-J-G (China) are almost as advantaged as the most advantaged schools in Canada. Moving leftwards across the chart,

YOUR SCHOOL'S

across proficiency levels in science is presented in Figure 4.12

knowledge to recognize or identify explanations of simple scientific phenomenon, they do not demonstrate the baseline proficiency in science that would enable them to be successful in science-related endeavors.

When looking at this figure, it is useful to consider whether your school is stimulating students to achieve at world-class levels (Levels 5 and 6) while simultaneously ensuring that few students are performing below proficiency Level 2. Or, conversely, a school may show results that indicate most students are performing at Levels 2, 3 and 4, with few students achieving at the highest levels internationally.

Box 4.6 Learning from the OECD Test for Schools: Two schools' efforts to decrease the percentage of students performing below Level 2

Arroyo Grande High School's (AGHS) 15-year-old students participated in the OECD Test for Schools 2012 pilot. The school's results from the pilot showed that 29% of students at Arroyo Grande performed below Level 2 in reading, 39% in mathematics, and 20% in science. In response to these results, AGHS took significant action. The school focused on revising its formative assessments to provide more valuable data and help teachers understand how to embed critical thinking skills into classroom instruction. The school also implemented a school-wide focus on critical reading and writing, which included the use of rubrics by each department to help teachers assess and support students' progress. In addition, AGHS also shifted its school schedule to allow for more professional

Box 4.7 What PISA shows regarding student attitudes in science

Educators across OECD countries are mindful of today's challenges of meeting a growing demand for science-related qualifications among young adults entering the workforce. In PISA 2015, the majority of students across OECD countries reported a positive disposition towards learning science. Almost two-thirds (64%) of students reported that they are interested in learning about science, and 66% said they agree or strongly agree that they enjoy acquiring new science knowledge. However, this enjoyment and interest in science does not necessarily predict what students believe will be their career trajectories. Almost one in four (24%) students reported that they expected to work in a career where they would need further science training past compulsory education. Of these students, the largest share envisages a career in a health-related field such as doctor, nurse or veterinarian.

One challenge facing educators, therefore, is to ensure that students are motivated and well prepared to achieve scientific excellence in the future. How can schools foster and strengthen engagement in science-related areas and such that young adults leave school with the motivation and capacity to continue learning throughout life? The following are some of the insights from the most recent PISA cycle regarding factors surrounding student interest and achievement in science:

- **More students now expect to have science-related careers**

  PISA 2006 also asked students about career expectations, which allows for a comparison over time in beliefs about pursuing science-related occupations. In comparison to 2006, the share of students expecting to work in a science field has increased, which is mostly attributable to the higher proportion of students interested in working in a health-related occupation.

  PISA 2015 results also show that female students are almost as likely to choose scientific study and science careers as males; however they will choose different fields within science. Female students are much more likely to anticipate a career in health, such as working as a doctor or nurse, than a career in engineering or ICT.

- **The expectation of pursuing a career in science is related to science proficiency**

  Across OECD countries, the highest-performers in science are more likely to expect to have a career in science by the age of 30. Among these students, 42% of students expect to have a career in science versus only 13% of students who score below proficiency Level 2.

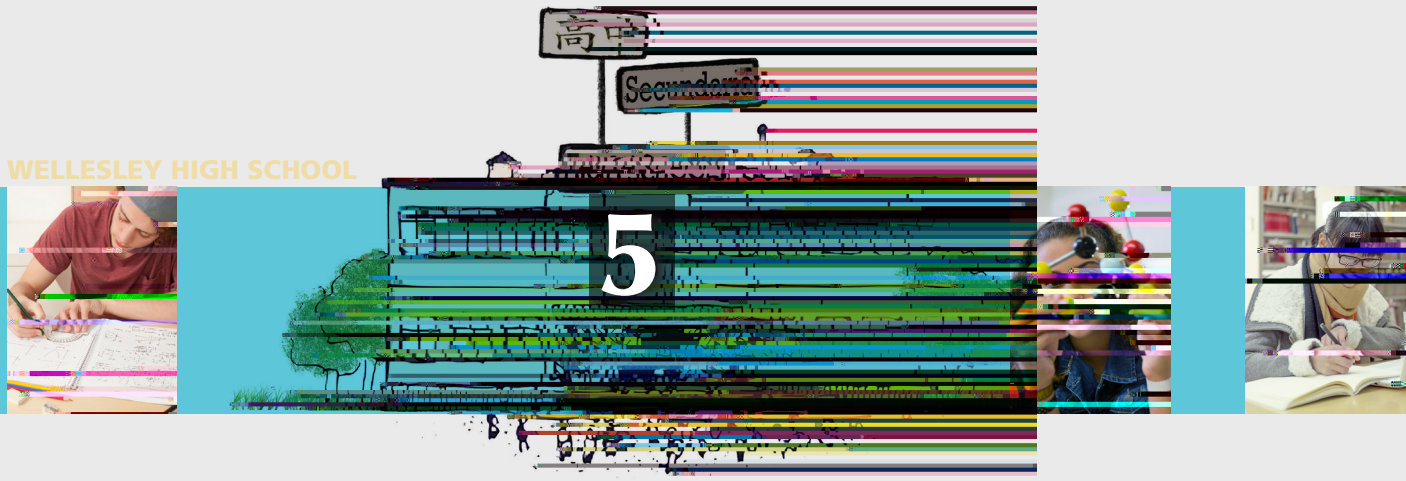
- **Students in 2015 reported participating in more science-related activities than their counterparts in 2006.**

  However, only a small group of students reported that they participate regularly, or even very often, in science-related activities outside of school. Across OECD countries, about 23% of students said they watched TV programs about science, which was the most popularly reported activity to engage in, and 19% at least regularly visit science websites. This varies from country to country, however, as students in Korea are more inclined to attend a science club than watch a science program on TV, whereas students in France tend to gravitate more towards visiting websites about science topics.

- **Students who participate in more science-related activities perform better in science.**

  Countries that saw an increase in students engaging in science activities outside of the classroom also saw increases in students' sense of self-efficacy in science as well as their intrinsic motivation to learn science, both of which are related to higher levels of performance. Student experiences and dedication are important drivers of performance in science, as are student attitudes and motivations.

  However, boys are more inclined to report this motivation than girls. Across OECD countries, boys were more likely to agree with statements such as "I enjoy acquiring new knowledge in science", suggesting a between gender difference in intrinsic motivation to learn science.



Excellence and Equity at Your School

To what extent is high performance distributed equitably within your school? This section focuses on the performance of different groups of students in your school and presents their results alongside their international counterparts.

While attaining high overall educational performance is important, equally important is ensuring that high performance is achieved by all students. Achieving educational excellence without equity could indicate a lack of fairness and risks producing social disparities. On the other hand, attaining widespread, low achievement is also not a desirable outcome.

An education system that achieves equity of outcomes is one in which students' circumstances, such as gender or socio-economic background, do not influence their performance. Almost all students would reach baseline levels of literacy in all domains and many would attain the very highest levels of proficiency. Ensuring that ambitious goals are met for all students, therefore, is a characteristic of the most successful educational systems.

Box 5.1 Within-country and within-schools results

In this report, most results related to countries and economies are reported as within-country results. For example, if a result refers to the scores of the top and bottom 25% of students from a country in terms of socio-economic status, then the result is referring to the scores of the quarter of students within the country who are the most advantaged and the scores of the quarter who are the least. While this is a useful measure, it may overlook some schools in a country or economy. In most countries and economies, students do not enroll in schools randomly. Instead, they are sorted based upon proximity, ability or preferences. Therefore, a within-country result is likely to over-represent students from some schools and under-represent students from others (e.g., the most advantaged 25% of students in a country or economy may only come from 10% of the schools).

An alternative method is to compare within-schools results from countries and economies. Unlike a within-country result, a within-schools result is a "mean of means" that represents all schools in a country or economy. If, for example, an entity's result refers to the scores of the top and bottom 25% of students within-schools in terms of socio-economic status, this result is produced by calculating the average score of the top and bottom 25% of students in terms of socio-economic status in , , .. in a country or economy. The mean scores from each school are then averaged to produce the mean score within-schools of the top and bottom 25% of students in terms of socio-economic status in a country or economy. In effect, the information represents the results of the average school in a country or economy.

This section of your school's report focuses on equity, with special attention to the results of specific groups of students within your school. Thus, this section will primarily compare your school's results with within-schools results, and not within-country results, from other countries and economies. This distinction is clearly identified in accompanying figures and in the text of this section.

Methodology

Two different types of within-schools analyses are performed in this section. The first is identifying student quartiles, which is used when comparing the highest- and lowest-performing students from your school in each domain to their global peers. To calculate this result, within each school in a country or economy, the student scores that represent the top and bottom quartiles of performance (the scores above and below which 25% of students are found) in each domain are identified. These scores are then averaged across all schools in the respective country or economy to produce within-schools, country-level results in each domain for these same performance percentiles.

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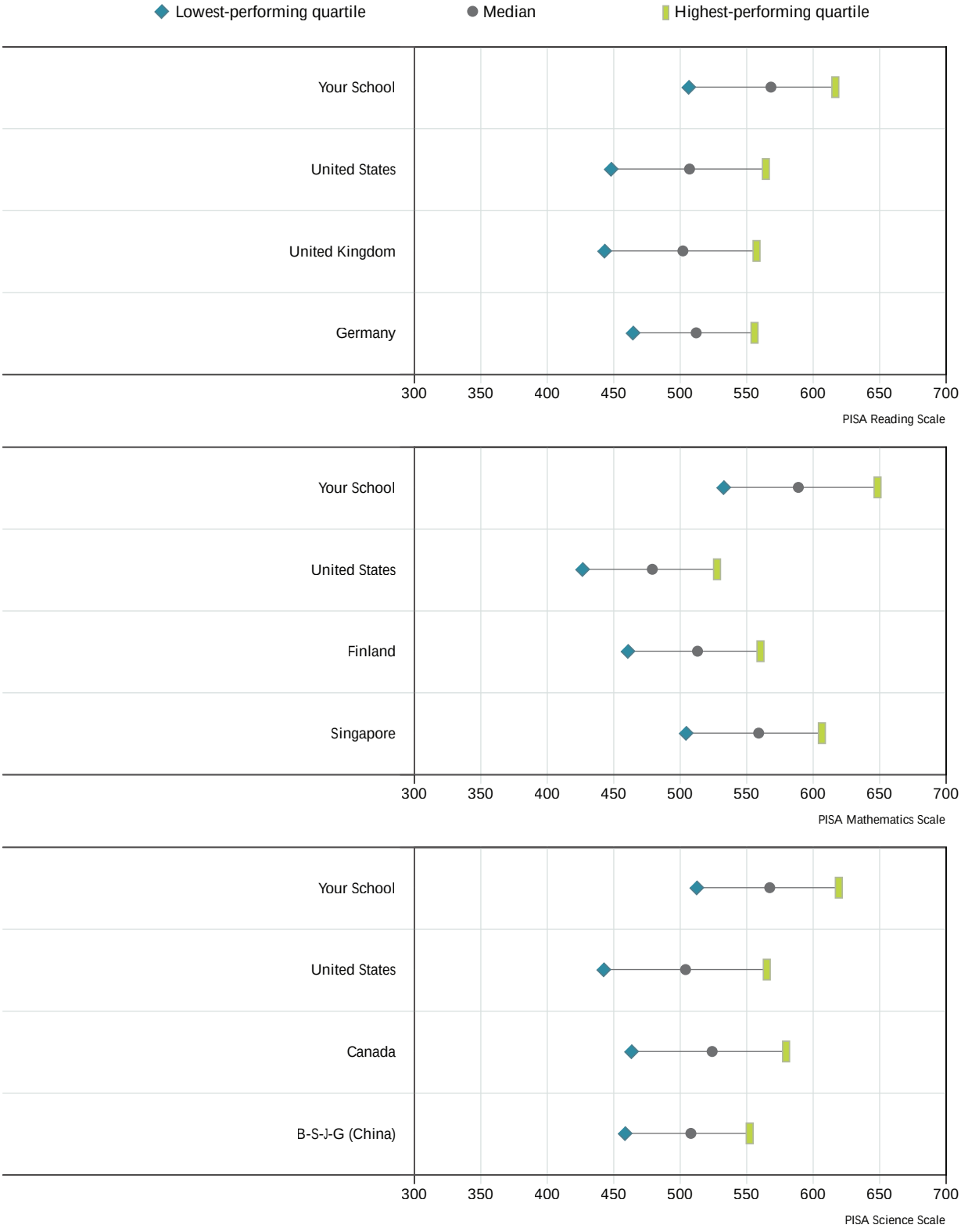
HIGH SCHOOL

Secundaria
HIGH SCHOOL

Figure 5.1 ▪ **How the highest- and lowest-performing students perform in reading, mathematics and science within your school and within schools in other countries and economies**



Secundaria
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While the previous figure shows the distribution of student performance in each domain separately, it is also useful to consider student performance across all three domains. Students who attain Level 5 proficiency in all domains are considered academic all-rounders. Singapore has the highest percentage of students within-schools who are top performers, with 12% on average. These students are well prepared to pursue further studies and navigate job markets in a competitive, knowledge-based global economy. How many academic all-rounders an education system produces is an indication of how successfully the system nurtures educational excellence.

The counterparts to top performers are at-risk students who do not meet Level 2 baseline proficiency in any domain. In Algeria, within-schools, an average of 74% of students are at risk. These students can complete only the simplest and most obvious tasks and can be expected to encounter difficulty in future educational and professional pursuits. How few at-risk students an education system produces is an indication of how successfully the system nurtures equity.

How many students at your school demonstrate high achievement in all three domains? How many students do not demonstrate baseline competence in any domain? The next figure can help illustrate the range of learning outcomes in your school. It shows the extent and distribution of student achievement at your school and other countries and economies, using the PISA proficiency levels defined in Section 2 of this report. A dark vertical line in the middle of the figure separates two groups of students. On the left side of the line is the percentage of students who achieve below Level 2 baseline proficiency in all domains (at-risk students). On the right side of the line is the percentage of students who attain at least Level 5 proficiency in all domains (academic all-rounders).

When interpreting this figure, it is helpful to consider the concentrat/MCID1s>>BDC BT-0.016lpful tbatatlao0 10 70.8661y

Box 5.3 Another challenge for teachers: Integrating students with an immigrant background

Are teachers well-equipped to help migrant children integrate into their new communities? A finding from PISA is the significant cross-country variation in performance between immigrant students

SOCIO-ECONOMIC BACKGROUND

While Figure 5.1 and Figure 5.2 examined the size of achievement gaps in your school and other countries and economies, it is also important to consider what factors are related to gaps in performance. As mentioned in Section 2 of this report, PISA shows that socio-economic status is a predictor of performance in many countries and economies. Students from more advantaged backgrounds tend to demonstrate higher performance than students from less advantaged backgrounds.

Nevertheless, PISA 2015 also shows that the within-schools relationship between socio-economic status and performance varies across countries and economies, including high-performing ones. For example, in Finland, the most advantaged quartile of students within-schools according to ESCS, scores, on average, 59 points higher in science than the least advantaged quartile of students within-schools. In B-S-J-G (China) however, the most advantaged quartile of students within-schools scores only 11 points higher, on average, than the least advantaged quartile of students within-schools. These results suggest that excellence and equity in outcomes[1] are not mutually exclusive. High performance and equitable performance can be achieved by

quartile of students within-schools, on average. Finland also has the largest within-schools achievement gap in reading according to socio-economic status, with an average of 59 points.

Japan has one of the smallest achievement gaps in reading and mathematics within-schools according to socio-economic status, at 13 points in each domain. It is important to note that Japan is also one of the highest-performing countries and economies in PISA, further emphasizing that high performance and equitable performance can be achieved simultaneously.

To what extent do students at your school show gaps in performance according to socio-economic status? And how do your school's socio-economic performance gaps compare with those of schools in other countries and economies? This information is shown in Figure 5.3. The figure contains three sets of charts, one for each domain. In each set of charts, your school's results are displayed next to the average, within-school results of comparison countries and economies.

In the individual charts that depict your school's results, the green marker represents the average performance of the top quartile of students from your school according to their socio-economic status. In other words, they are the most socio-economically advantaged students at your school. The blue marker represents the average performance of the bottom quartile of students from your school according to their socio-economic status. They are the least socio-economically advantaged students at your school. A line connects these two markers and shows the performance gap between these two groups of students. A circle on the line represents the average performance of all students at your school.

In the individual charts that depict the results of other countries and economies, the green marker shows the average performance for the top quartile of students according to their socio-economic status in that country or economy. The blue marker in each country or economy's chart shows the average performance for the bottom quartile of students according toethe bottomng toethe en-GBbottom quart6 (sho)19851 T5 (t

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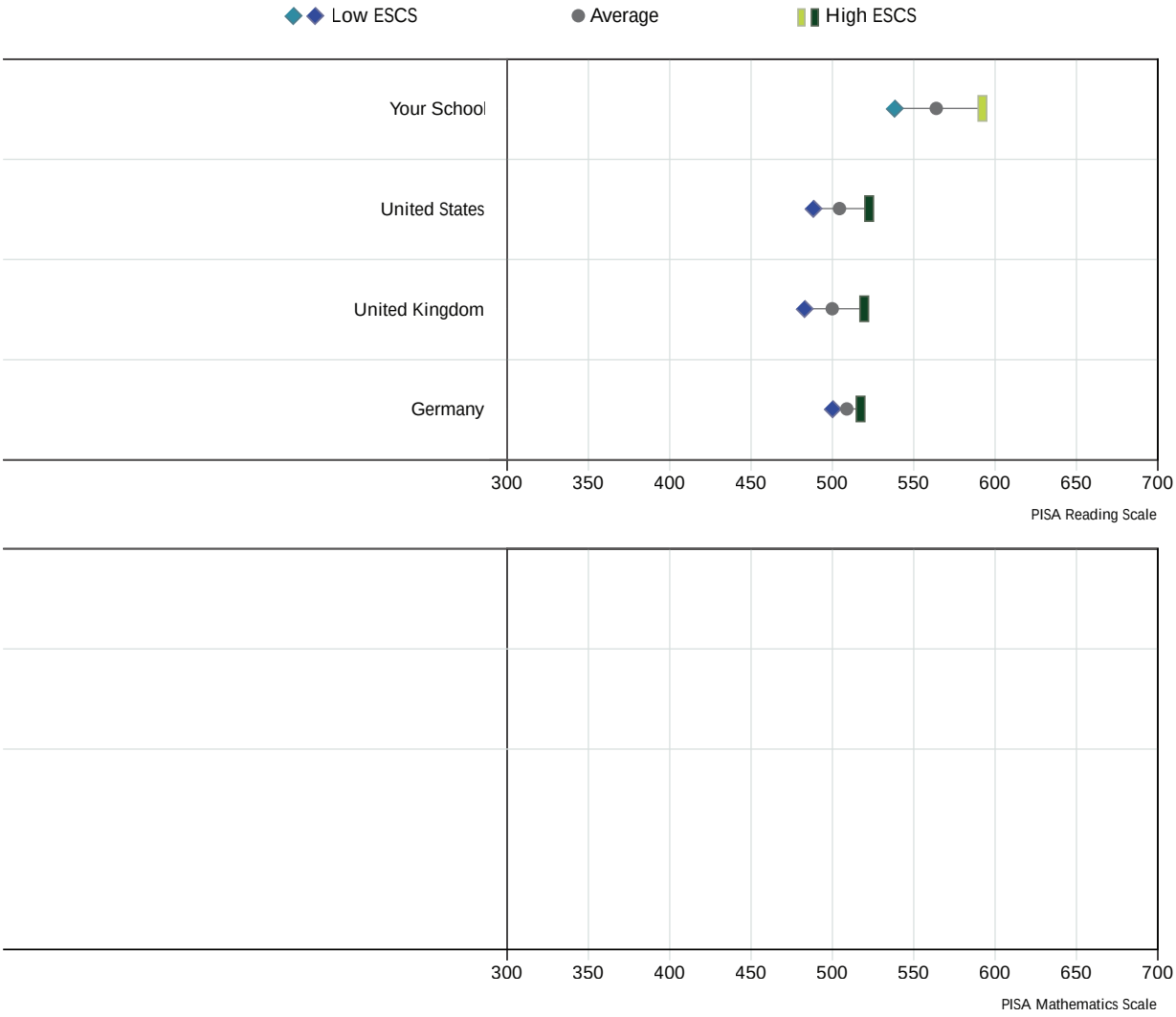
Figure 5.3 ■ **Student performance within your school and within schools in selected countries and economies in reading, mathematics and science according to socio-economic status**



N. . : Within each school, country, or economy shown above, darker colored markers indicate that the difference between the high and low markers is statistically significantly different from one another.

Box 5.4 Equity and performance in PISA 2015

Equity in education is a central issue to address for schools and school systems around the world. It is a key element of the Sustainable Development Goals adopted by the United Nations in 2015. The goal is to equip students with the necessary skills to achieve their full potential, regardless of differences in socio-economic background.

For students who face challenging social and economic circumstances, mastering basic literacy and numeracy skills can be more challenging than for their advantaged peers. This link between socio-economic background and performance remains strong. PISA 2015 shows that students from disadvantaged backgrounds are almost three times more likely than their advantaged peers not to attain a baseline level of proficiency in science.

PISA 2015 explores two concepts in relation to equity: inclusion and fairness. Inclusion refers to the goal of ensuring that all students, irrespective of their social backgrounds or marginalized status, have access to a high-quality education and reach at least a baseline level of skills, which in PISA is proficiency Level 2. Inclusion can be identified by a number of factors, notably a student's access to schooling (which can be measured by enrollment rates), as well as the percentage of students who perform at or above baseline levels. On the other hand, fairness refers to issues such as equal access to educational resources, which involves removing talent-obstructing obstacles that arise due to economic or social circumstances.

While global education systems are not perfectly equitable, PISA 2015 also shows that poverty is not destiny. There are students from disadvantaged backgrounds who manage to beat the odds and outperform what would be predicted of them based on their socio-economic status. These students are considered to be resilient. In some countries, such as Estonia, Finland and Japan, as many as four in ten disadvantaged students are said to be resilient.

Box 5.5 Teachers, school organization and equity

The OECD uses data from PISA and case studies from around the world to identify the characteristics of education systems that do most to achieve excellence, equity and inclusion. In this context, there are three important areas that can be focused on: teaching quality, school organization and the learning environment. Rigorous reviews of this evidence have produced the following recommendations:

- **Ensure disadvantaged students have good teachers:** Teachers in disadvantaged schools are more likely to be inexperienced and less qualified than those in wealthier schools.
- **Address the needs of teachers in disadvantaged schools:** Teachers are also more likely to want to work in disadvantaged schools if they feel they have support from principals, collaboration with colleagues and adequate resources as well as fair remuneration.
- **Encourage diversity in the teaching profession:** Teachers from minority backgrounds can serve as important role models for diverse student populations.

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GENDER

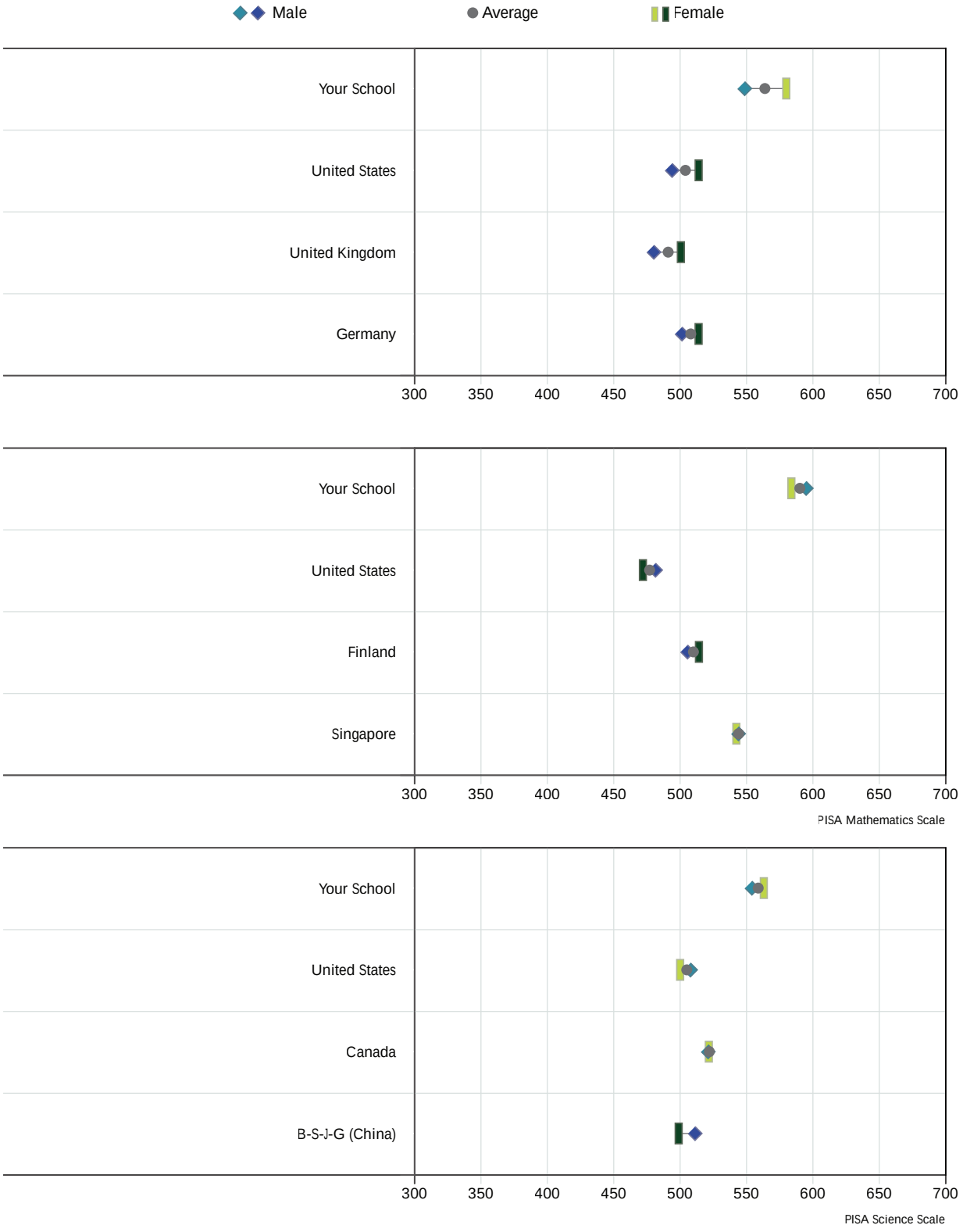
Your school's performance with respect to gender

PISA 2015 data show that, on average, within-schools, girls perform slightly better in reading while boys perform slightly better in mathematics and science. These results however, vary across countries and economies.

In science, the largest within-schools gap in favor of boys is 25 points in Austria. The largest gap in favor of girls is 22 in Finland. In mathematics, Croatia's gap of 29 points is the largest difference in favor of boys. Finland's gap of 9 points is the largest difference in favor of girls. In reading, Georgia had the largest gap in favor of girls, at 51 points. No country had a gap in favor of boys, though Peru's gap was less than one point in favor of girls.

Are there achievement gaps according to gender at your school? How might those gaps compare with gaps in your country and around the world? Figure 5.4

Figure 5.4 ▪ **How girls and boys perform in reading, mathematics and science within your school and within-schools in other countries and economies**



N. . : Within the school, country, or economy shown above, darker colored markers indicate that the difference between boys and girls is statistically significantly different from one another.

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Unlike mathematics and science, reading is a domain in which PISA consistently finds girls to outperform boys. Across OECD countries in 2015, girls outperform boys by 27 points within-country on the reading assessment. However, this gap narrowed by 12 points since PISA 2012. This reduction was attributed to both a five-point increase in boys' performance, particularly among the highest-performing students, as well as a seven point decrease in performance of girls, most notably among in the lowest-performing students.

These gender gaps are not limited to student populations and are also pervasive among teachers and school leaders. The vast majority of teachers are female across OECD countries. While there is a tendency to try and connect the lower performance of boys (particularly in reading) to the fact that most teachers are female, the research does not suggest that bringing men into the teaching profession would improve boys' achievement, as measured by test results. However, aiming for a better balance of men and women among teachers can nevertheless have positive effects. Male teachers can serve as role models, particularly for those students who do not have many positive male influences in their lives.

Also worth noting is that while teaching is a predominantly female profession, school leaders are more likely to be men in many countries. For example, 68% of Korean teachers are female whereas only 13% of Korean principals are women. In Finland and Portugal, 7 out of 10 teachers are women, but only 4 out of 10 principals are.

A concerted effort by parents, teachers, policy makers and opinion leaders is needed to narrow and potentially close gender gaps. Gender equality does not mean that males and females should become the same, but rather that a person's opportunities should not depend on whether they are born male or female.

For more information on how education can play a role in shaping attitudes and transforming behaviors to improve gender equity, see:

B , A. (1997).

Your school's results in this report were obtained from your decision to participate in the current cycle of testing in the United States of the [illegible]. You are therefore part of a select group of schools that willingly took part in the assessment that offers a unique tool for local, national and international benchmarking for improvement.

The OECD secretariat selected NWEA to be the accredited service provider and partner for this cycle of testing in the United States. NWEA was responsible for the test administration and quality-assurance procedures during all phases of the testing with the schools and districts. As such, the entity organized the testing sessions directly with participating schools. NWEA also conducted the coding, scoring and data management of the school data.

The following table provides a summary of your school's participation in the *OECD* [illegible]

School name	**Wellesley High School**
Unique identifier	9356c060-6ac4-4247-9c5b-e862f09e4784
District/local authority	Wellesley
Location	Town (15,000 to about 100,000 people)
State	MA
Country	United States
School type	Public
Total number of students enrolled	1,531
Percentage of students eligible for free- or reduced-price lunches through the national school lunch program	7
Test date(s)	

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This annex provides examples of test questions that are indicative of the types of questions students had to work through in the assessment. For a more complete set of PISA test questions, readers are invited to look through the reading, mathematics and science items included on the

Refer to the newspaper article “Indian Mystic” on the previous page to answer the questions that follow.

INDIAN MYSTIC

Question intent

Identify an author’s attitude in a persuasive text.

Full Credit

Refers to the idea that the author does not believe in inedia and provides evidence to support this. May quote directly from the text.

- The author doesn’t believe people can survive without food or drink because he says the human body

M P P is ranked medium on the item map. It asks students to integrate and develop an interpretation with information gathered from a text as well as recognize different descriptions in a text.

2. MOBILE PHONE PLANS

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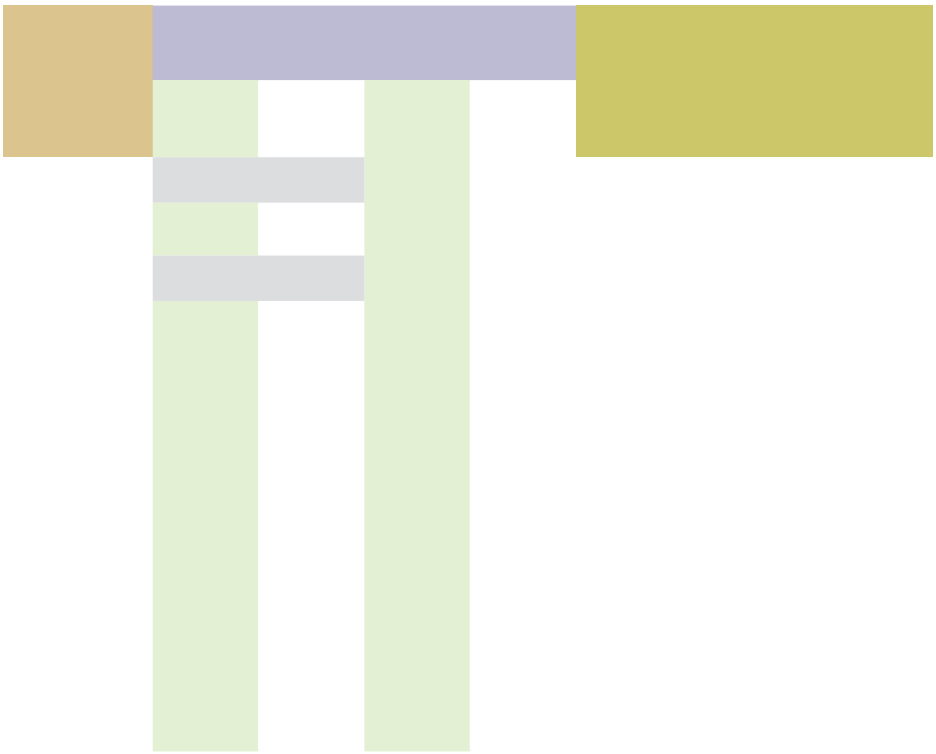

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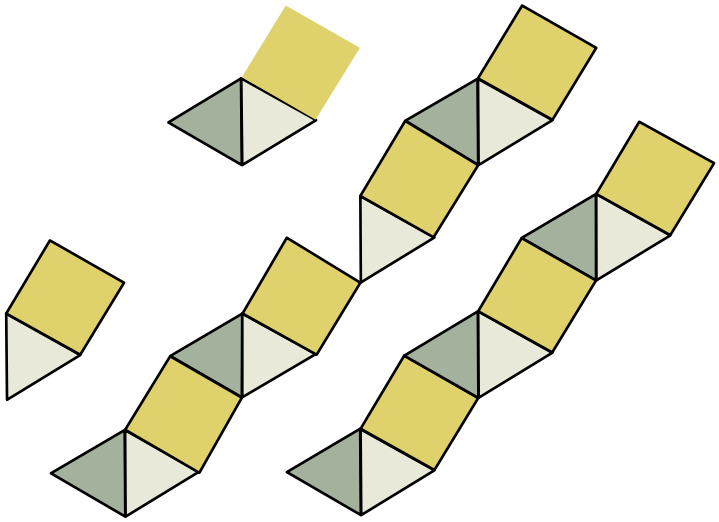
T P is ranked between medium and difficult on the item map. It asks a student to look at space and shape in order to find an interior angle.

5. TILING PATTERN



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Question intent

[illegible]

Full Credit

2,984 [illegible]

Partial Credit

Work shows correct method but **one** error made.

- 2 x 20 x 34.6 + 40 x 40 or equivalent shown but one calculation error made
- 2 x 40 x 34.6 + 40 x 40 correctly evaluated (4,368) [illegible]
- 20 x 34.6 [illegible] + 40 x 40 correctly evaluated giving 2,292

Work shows correct method but **incomplete.**

- 2 x 20 x 34.6 + 40 x 40 or equivalent shown but not evaluated
- 2 x 20 x 34.6 + 40 x 40 = 1,384 + ……

No Credit

Other responses.

Missing.

F is ranked medium on the item map. It asks students to create a correct formula in a context based on a linear relationship between fixed and variable costs.

6. WHICH FORMULA

Steph and Jawad run their own businesses.

Steph makes greeting cards and sells them at a market each Sunday.

Jawad is a gardener.

WELLESLEY HIGH SCHOOL

[illegible]

.....

.....

[illegible]

Question intent

[illegible]

Full Credit

An expression that shows an understanding of the relationship between total charge, fixed charge, hourly charge and hours

- C = 30 + 20
- C = 20 + × 30
- Charge = 30 zeds x number of hours + 20 zeds

Partial Credit

An expression that shows an understanding of the relationship between total charge, hourly charge and hours [illegible]

- C = 30
- C = × 30
- Charge = 30 zeds x number of hours

No Credit

Other responses.

Missing.

C [illegible]

This question presents students with an informal linear algebra situation in a familiar [illegible] context involving costs and charges. The world of work is becoming increasingly familiar and important for many 15-year-olds and the relationship between costs and charges, both fixed and variable, is an important one. To gain credit for this task, students need to create a correct formula in a context based on a linear relationship between fixed and variable costs. The intention of this item is to assess whether students can interpret the information provided in context, see the underlying relationships, then express the relationships symbolically using conventional algebraic notation and conventions, hence the content categorization [illegible]. Because the students are only required to formulate the equation and are not required to perform any calculations, perform any algebraic manipulations or use the equation in any way, the item process is categorized as formulate. Despite being a routine style of algebra question presented in an informal way, only about one out of two 15-year-olds would be expected to correctly write down the correct algebraic equation. This is partly because in most countries algebra is still a relatively new topic in school curricula for 15-year-olds. However, this is also because rather than assessing routine algebraic manipulations, the item requires genuine understanding of the underlying structure of an algebraic formula.

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O S is ranked medium on the item map. It asks a student to identify scientific issues related to the environment.

3. OIL SPILLS

Oil spills from ships can seriously pollute oceans, beaches and rivers. After an oil spill, booms and □oating sponges are used to reduce pollution effects.

Boom in place around an oil spill

An investigation into the effect of bacteria on oil in water is made in 5 steps.

Step 1	Half □ll a screw top jar with seawater.
Step 2	Add a sample of oil to the jar.
Step 3	Add some liquid containing bacteria.
Step 4	Seal the jar and leave it for several days.
Step 5	Observe the contents of the jar.

OIL SPILLS

Full Credit

Responses should focus on the fact that seawater in a sealed jar does not have the same conditions as real seawater.

- Doesn't model seawater because it is in a sealed container.

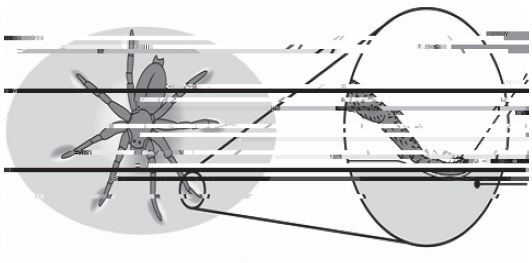
No Credit

Other responses.

Missing.

F is ranked between medium and difficult on the item map. It asks students to explain a phenomenon scientifically.

4. FLOATING



Spider or insect walking on water

Metal paper clip oating on water in a glass

FLOATING

.....

.....

Question intent

Full Credit

Mentions the surface tension of the water and/or expresses the idea of the weight of the object being spread over a large area.

- The water exerts a force that acts on the spider leg and the paper clip. The weight of the spider or the paper clip is not enough to overcome this force.
- The force of gravity on the spider and the paper clip is not enough to break the surface tension of the water.
- There is a force holding the water molecules together. If the object laying on the surface is not heavy enough then it will not break through and sink.

No Credit

Responses that do not meet the criteria for code 1.

- The spider and the paper clip are less dense than water.

Missing.

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C

This item from the [illegible] unit is an example of a difficult question to which only about one out of five students are expected to answer correctly with full credit. Students are asked to use knowledge of science where a correct response requires an explanation of an observed scientific phenomenon: that objects with a density greater than water are able to float on water. Visual clues to assist students with their response are provided in the question stimulus. Students need to have only a broad understanding of the concept of surface tension; it is not necessary to use this term in the response to gain credit. Students needed to discriminate between aspects of the visual clues and thus a response that focused on buoyancy, for example, would not gain credit. Surface chemistry is a rapidly evolving field of science; hence the question is classified as [illegible]

For a more complete set of PISA test questions, readers are invited to look through the reading, mathematics and science items included in the OECD publication:

- [illegible]

Tables of results from PISA 2015 for countries and economies

The tables included in this annex present summary results for all countries and economies that participated in PISA 2015. These tables represent only a small fraction of the information provided in multiple volumes of the PISA 2015 results. To put your school's results further in context, the reader is invited to use the tables in this annex to explore basic results from PISA 2015 for a wide range of countries and economies, including the selected group of countries and economies presented throughout the report. More detailed results for all participating countries and economies can be found on the

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How Your School Compares Internationally

How prepared are 15-year-old students at your school to continue as lifelong learners, to find and fill jobs of the 21st century and compete and collaborate as citizens in a globalized economy?

The OECD Programme for International Student Assessment (PISA) has evaluated and compared education systems worldwide for more than a decade, highlighting education systems that have either repeatedly outperformed others or have shown considerable improvement – sometimes within a relatively short period of time.

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