Definitions (PISA 2015)

Proficiency scales

Level	Science	Mathematics	Reading
6	Higher than 707.93 score points	Higher than 669.3 score points	Higher than 698.32 score points
5	From 633.33 to less than 707.93 score points	From 606.99 to less than 669.3 score points	From 625.61 to less than 698.32 score points
4	From 558.73 to less than 633.33 score points	From 544.68 to less than 606.99 score points	From 552.89 to less than 625.61 score points
3	From 484.14 to less than 558.73 score points	From 482.38 to less than 544.68 score points	From 480.18 to less than 552.89 score points
2	From 409.54 to less than 484.14 score points	From 420.07 to less than 482.38 score points	From 407.47 to less than 480.18 score points
1		From 357.77 to less than 420.07 score points	
1a	From 334.94 to less than 409.54 score points		From 334.75 to less than 407.47 score points
1b	From 260.54 to less than 334.94 score points		From 262.04 to less than 334.75 score points

Top performers

Top performers are those students proficient at Level 5 or 6 on the assessment.

Baseline level of proficiency

In PISA, Level 2 is considered the baseline level of proficiency in science, reading and mathematics. In science, students scoring at Level 2 can draw on their knowledge of basic science content and procedures to identify an appropriate explanation, interpret data, and identify the question being addressed in a simple experiment.

Low performers

Low performers are those students performing below Level 2 on the assessment. Low performers may be able to use basic or everyday scientific knowledge to recognise or identify aspects of familiar or simple scientific phenomena. However, they also often confuse key features of a scientific investigation, apply incorrect scientific information and mix personal beliefs with scientific facts in support of a decision.

ESCS

ESCS refers to the *PISA index of economic, social and cultural status*. See Volume II of the *PISA 2015 Results* for more information.

Strength of the relationship between student performance and socio-economic status

The strength of this relationship refers to how well socio-economic status predicts performance. It is measured as the percentage of the variation in performance explained by the PISA index of economic, social and cultural status (ESCS): r-squared*100.

Slope of the socio-economic gradient

The slope of the socio-economic gradient refers to the impact of socio-economic status on performance. It is measured by the average difference in performance (score-point difference) between two students whose socio-economic status differs by one unit on the *PISA index of economic, social and cultural status* (ESCS).

Resilient students

A student is classified as resilient if he or she is in the bottom quarter of the *PISA index of economic, social and cultural status* (ESCS) in the country of assessment and performs internationally in the top quarter of students, after accounting for socio-economic status.

Advantaged (disadvantaged) schools

Advantaged (disadvantaged) schools are those in the top (bottom) quarter of the distribution of the school-level PISA index of economic, social and cultural status (ESCS) within each country/economy.

Index of social inclusion

The index of social inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of socio-economic status, i.e. the variation in the *PISA index of social, economic and cultural status of students* (ESCS) between schools, divided by the sum of the variation in students' socio-economic status between schools and the variance in students' socio-economic status within schools.

Scale indices

The indices were standardised so that **the mean of the index value for the OECD student population was zero and the standard deviation was one** (countries being given equal weight in the standardisation process).

Negative values for an index do not necessarily imply that students responded negatively to the underlying questions. A negative value merely indicates that the respondents answered less positively than all respondents did on average across OECD countries. Likewise, a positive value on an index indicates that the respondents answered more favourably, or more positively, than respondents did, on average, across OECD countries. For more details on how each scale index was constructed see the *PISA 2015 Technical Report* (OECD, https://www.oecd.org/education/pisa-2015-assessment-and-analytical-framework-9789264255425-en.htm).

Openness to problem solving

Constructed index based on students' responses about their willingness to engage with problems. PISA measures students' openness to problem solving through their responses to questions asking about the extent to which they feel they resemble someone who can handle a

lot of information, is quick to understand things, seeks explanations for things, can easily link facts together and likes to solve complex problems.

Perseverance

Constructed index based on students' responses about their willingness to work on problems that are difficult, even when they encounter problems. PISA measures students' perseverance through their responses to questions asking about the extent to which they feel they resemble someone who gives up easily when confronted with a problem, who puts off difficult problems, who remains interested in the tasks that he or she starts, who continues to work on a task until everything is perfect, and who does more than is expected of him or her when confronted with a problem.

Mathematics self-efficacy

Constructed index based on students' responses about their perceived ability to solve a range of pure and applied mathematics problems. PISA measures students' mathematics self-efficacy through their responses to questions about whether they would feel confident doing a range of pure and applied mathematical tasks involving some algebra, such as using a train timetable to work out how long it would take to get from one place to another; calculating how much cheaper a TV would be after a 30% discount; calculating how many square metres of tiles would be needed to cover a floor; calculating the petrol-consumption rate of a car; understanding graphs presented in newspapers; finding the actual distance between two places on a map with a 1:10-000 scale; and solving equations like $3x+5=17$ and $2(x+3)=(x+3)(x-3)$.

Intrinsic motivation to learn mathematics

Constructed indices based on students' responses about whether they enjoy mathematics and work hard in mathematics because they enjoy the subject. PISA measures students' intrinsic motivation to learn mathematics through students' responses as to whether they "strongly agree", "agree", "disagree" or "strongly disagree" that they enjoy reading about mathematics; that they look forward to mathematics lessons; and that they do mathematics because they enjoy it and that they are interested in the things they learn in mathematics.

Mathematics anxiety

Constructed index based on students' responses about feelings of stress and helplessness when dealing with mathematics. PISA measures students' mathematics anxiety through their responses to questions about whether they would agree or strongly agree that they often worry that mathematics classes will be difficult for them; that they get very tense when they have to do mathematics homework; that they get very nervous doing mathematics problems; that they feel helpless when doing a mathematics problem; and that they worry that they will get poor grades in mathematics.

Teacher-student relations

Constructed index based on student's responses about whether and to what extent they agree with several statements regarding their relationships with teachers at school, including whether they get along with their teachers, whether teachers are interested in their personal well-being, whether teachers take the student seriously, whether teachers are a source of support if the student needs extra help, and whether teachers treat the student fairly.

Ability grouping within schools

One form of horizontal stratification is ability grouping within the school. In organising mathematics instruction, for example, schools can differentiate their students according to their performance to create more homogeneous learning environments; other schools may opt to gather all students – irrespective of their academic performance – in the same classes to ensure that all students are granted the same opportunities to learn and thus have the same opportunities to succeed.

Index of quality of schools' educational resources

Constructed index based on school principals' responses about their perceptions about educational resources in their school. They were asked to report whether their school's capacity to provide instruction was hindered by a shortage or inadequacy of: science laboratory equipment, instructional materials (e.g. textbooks), computers for instruction, Internet connectivity, computer software for instruction, and library materials. Positive values reflect principals' perceptions that a shortage of educational resources hinders learning to a lesser extent than the OECD average, and negative values indicate that school principals believe the shortage hinders learning to a greater extent.

Equity in resource allocation

Equity in resource allocation refers to the difference in the *index of shortage of schools' educational resources* between socio-economically advantaged and disadvantaged schools. Higher values indicate a higher equity in resource allocation.

School responsibility for curriculum and assessment

Constructed index based on school principals' responses about whether the teachers, the principal, the school's governing board, the regional or local education authorities or the national education authority had considerable responsibility for allocating resources to schools (appointing and dismissing teachers; determining teachers' starting salaries and salary raises; and formulating school budgets and allocating them within the school) and responsibility for the curriculum and instructional assessment within the school (establishing student-assessment policies; choosing textbooks; and determining which courses are offered and the content of those courses). Higher values indicate more autonomy for school principals and teachers.