RESEARCH REPORT

PISA 2025

Montenegro

435

in science, highest since 2006

47

points below the 2025 OECD average in science

103

points between gymnasiums and vocational schools in science

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Montenegro in PISA 2025: a record in science, a wider divide

Fifteen-year-olds in Montenegro scored higher in PISA 2025 than in 2022 in all three domains, and in science higher than in any cycle since the country first took part in 2006. Set against twenty years of results, the region and the OECD average, the improvement is real but uneven: a record in science, a partial recovery in reading, little movement in mathematics. Inside the country, the distance between gymnasiums and vocational schools widened by about 20 points.

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PISA 2025

Key findings

01 Science reached 435 points, 20 above Montenegro's previous best (415 in 2018) after six cycles between 401 and 415. Reading rose to 418 and recovered most of its 2022 fall; mathematics, at 411, recovered about a fifth of it.

02 Montenegro is closer to the OECD average than at any point since 2006: 47 points behind in science, 52 in mathematics and 43 in reading. Part of the closing is Montenegro's own gain and part is the OECD's continued decline.

03 In a region where most systems declined, Croatia and Slovenia included, Montenegro improved. It now has the third-highest mean of ten regional systems in science and in reading, behind Slovenia and Croatia, and its distance to Croatia has roughly halved since 2022 (from 80 to 41 points in science). Within the Western Balkans it has the highest mean in science (level with Albania) and in reading.

04 The gap between gymnasium and vocational students grew from 79 to 103 points in science and is close to 100 in all three domains. It also widened on items answered in both cycles, by 16 points in science and 26 in mathematics, in a common-item model that does not use the 2025 plausible values.

05 Socio-economic status predicts performance less strongly than across the OECD. It is associated with performance both within and between schools: school-mean ESCS remains strongly associated with scores after adjustment for a student's own ESCS and for programme (79 points per unit of the index, against 10 for a student's own ESCS).

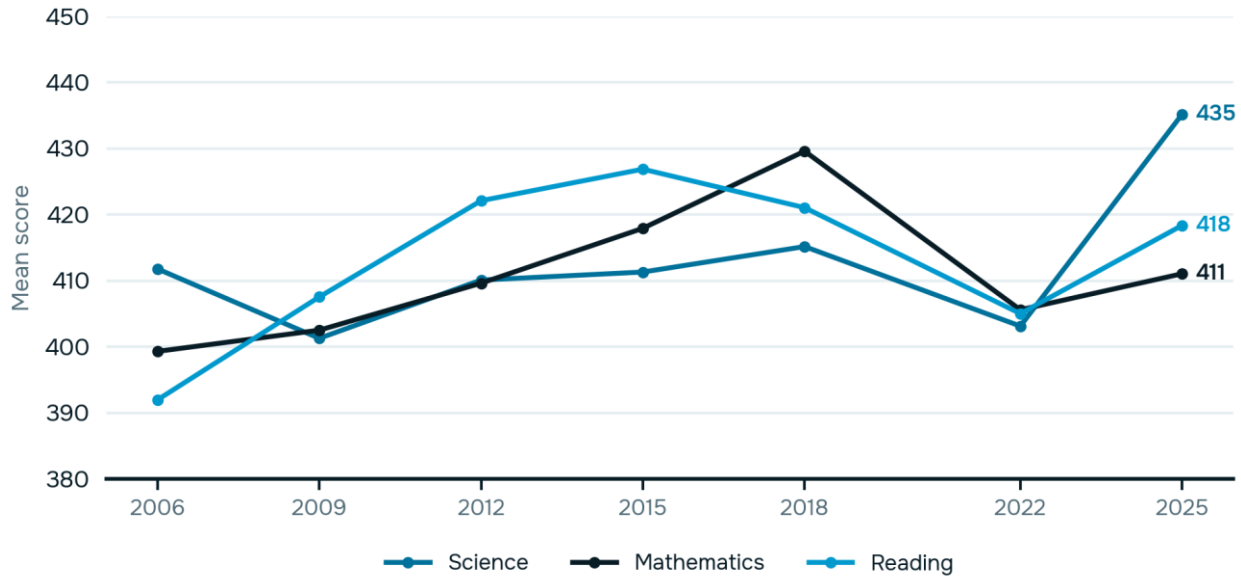
06 Growth mindset (the belief that intelligence can be developed), curiosity, perseverance and an orderly science classroom are each associated with 11 to 22 points higher science scores after adjustment for ESCS, programme and gender.

01

Twenty years of results

Montenegro has taken part in every PISA cycle since 2006, so 2025 can be read against a long baseline rather than against 2022 alone. That baseline changes what the 2025 results mean in each domain.

Figure 1. Mean scores in science, mathematics and reading, Montenegro, 2006 to 2025.



Source: OECD (2026a), Tables I.B1.2a.36-38. Each point is the published national mean.

In science, results were flat for fifteen years: 412 in 2006, 401 in 2009, 410 in 2012, 411 in 2015, 415 in 2018 and 403 in 2022. The 2025 score of 435 is not a return to an earlier level but a new one, 20 points above the previous best, and the OECD reports it as above every year before 2022 (OECD, 2026b). The share of students below the baseline Level 2 in science had stayed between 48% and 55% in every cycle; in 2025 it is 40%.

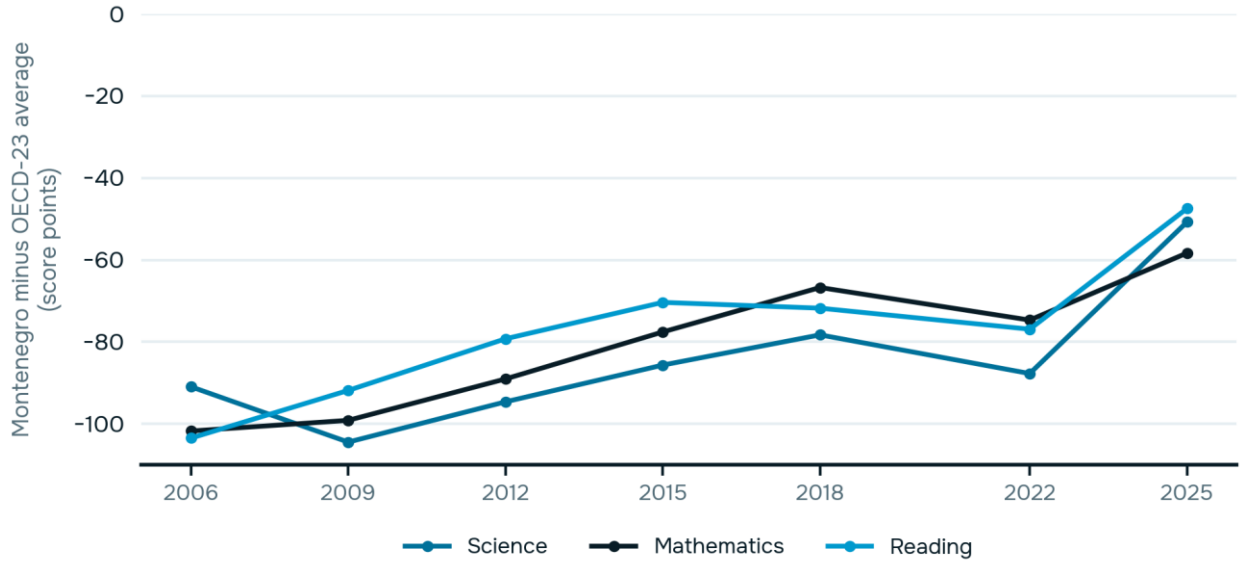
Reading and mathematics tell a different story. Both improved from 2006 to the late 2010s, reading to 427 in 2015 and mathematics to 430 in 2018, and both fell sharply in 2022. In 2025 reading recovered most of that fall (from 405 to 418, still 9 points below its peak) while mathematics recovered little of it (from 406 to 411, 19 points below its peak). In mathematics more than half of students (55.5%) remain below Level 2, against 46% in 2018. For these two domains the 2022 to 2025 gain is mostly a recovery from a slump; for science it is not.

02

Montenegro and the OECD average

The OECD average fell again in 2025, to the lowest level observed in all three domains (OECD, 2026a). Comparing Montenegro with the average of the 23 OECD countries that took part in every cycle keeps the reference group constant over time.

Figure 2. Distance between Montenegro and the OECD average, 2006 to 2025.



Source: OECD (2026a), Tables I.B1.2a.36-38. Montenegro's mean minus the average of the 23 OECD countries with data for every cycle.

In science the distance was between 78 and 104 points in every cycle up to 2022; in 2025 it is 51. In mathematics it fell to 58 and in reading to 47, both the smallest on record. The forces behind the closing differ by domain. In science Montenegro's own gain dominates (up 32 against an OECD fall of 5). In reading the two are similar (Montenegro up 13, the OECD down 16). In mathematics the OECD's decline does most of the work (Montenegro up 5, the OECD down 11). Against the full 2025 OECD average the distances are 47 points in science, 52 in mathematics and 43 in reading. Montenegro remains well below the OECD in all three domains, and closer than it has ever been.

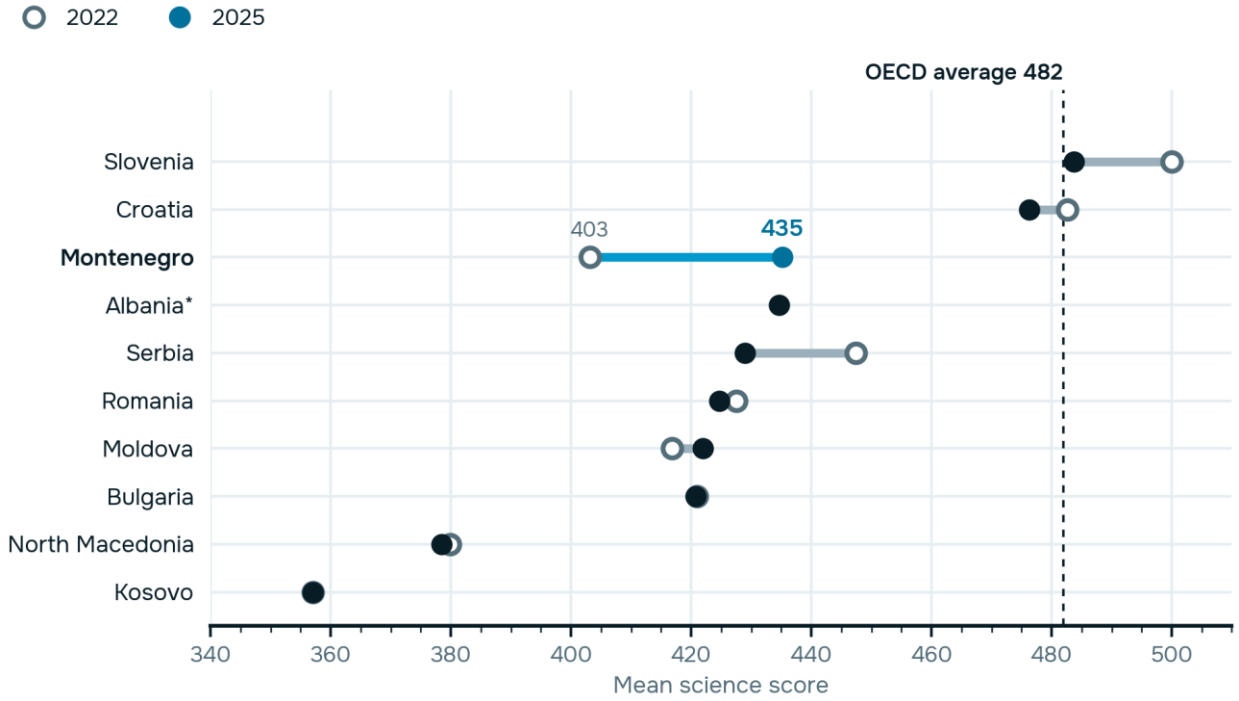
03

Montenegro in the region

2025	Science	Change since 2022	Mathematics	Reading
Slovenia	484	-16	460	445
Croatia	476	-6	455	453
Montenegro	**435**	**+32**	**411**	**418**
Albania*	435	Not comparable	433	408
Serbia	429	-18	417	415
Romania	425	-3	419	413
Bulgaria	421	0	405	387
North Macedonia	378	-1	380	357
Kosovo	357	0	350	340
OECD average	*482*		*463*	*461*

Mean scores; change in science score points. Source: OECD (2026a), Tables I.B1.2a.36-38. *Albania's 2025 estimate is subject to coverage bias and is not directly comparable with earlier cycles.

Figure 3. Mean science score in 2022 and 2025, Montenegro and the region.



Source: OECD (2026a), Table I.B1.2a.36. Albania is shown for 2025 only: the OECD flags it for limited reporting with no trend reporting.

Most systems in the region lost ground between 2022 and 2025. Serbia's published means fell by 18 to 26 points across the three domains. The OECD permits international and trend comparisons for Serbia, while noting increased exclusions and testing delayed by school strikes to the first weeks of the following school year; its trend caution is conditional on test engagement having changed markedly (OECD, 2026c). Slovenia fell by 16 to 25 points, Croatia by 6 to 22. Montenegro improved. Albania is shown for 2025 only: the OECD advises against reporting its trend because schools with fewer than 21 eligible students were not assessed and the resulting coverage gap cannot be fully corrected (OECD, 2026a). Among the ten systems, Montenegro has the third-highest mean in science and in reading, behind Slovenia and Croatia; its lead over Albania and Serbia in science, and over Serbia and Romania in reading, is within sampling error. In mathematics it is sixth, behind Slovenia, Croatia, Albania, Romania and Serbia.

The Western Balkans form a distinct subgroup within the region, and a relevant reference in their own right. Five of its six systems are in the PISA 2025 results; Bosnia and Herzegovina is not. Within this subgroup Montenegro has the highest mean in science, level with Albania (435 each), and in reading (418, ahead of Serbia at 415 and Albania at 408). In mathematics it is third, behind Albania and Serbia. In every earlier cycle in which both took part, Serbia was ahead of Montenegro in science and reading, by 24 to 44 points in science; in 2025 Montenegro is not behind Serbia in either, although its lead is within sampling error.

The distance to Croatia and Slovenia, the region's two highest-scoring systems in science, narrowed sharply. To Croatia it fell from 80 to 41 points in science and from 70 to 35 in reading; to Slovenia from 97 to 49 in science and from 64 to 26 in reading. The sources differ by domain: in science most of the narrowing is Montenegro's own gain of 32 points, while in reading most of it is the fall in Croatia (22 points) and Slovenia (24). In mathematics the distance narrowed from 58 to 44 points to Croatia and from

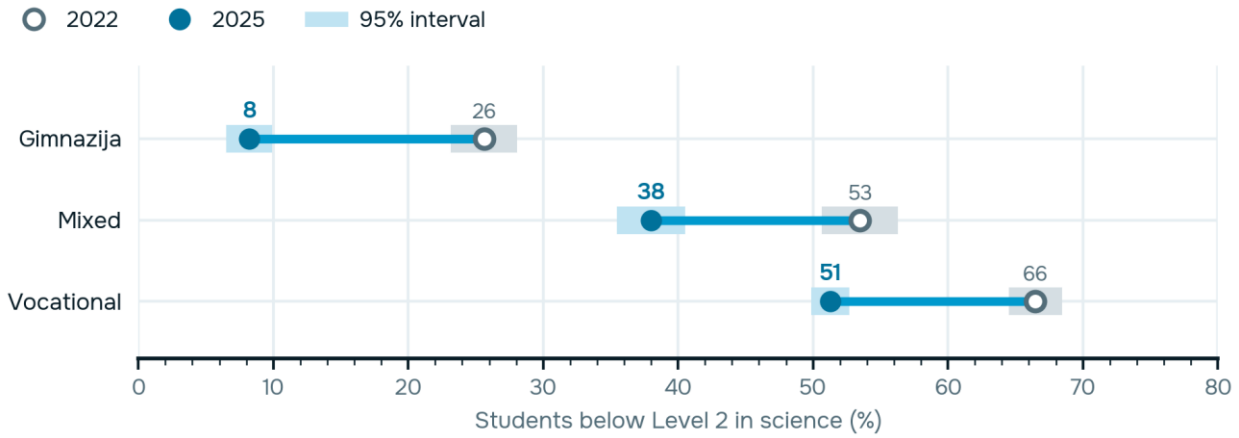
79 to 49 to Slovenia, mainly through Slovenia's fall of 25 points. In 2012 Montenegro was below every system in the table that took part that year except Albania, in all three domains.

04

The baseline moved, but not for everyone

The national improvement is concentrated in who crossed Level 2, the level at which a student can recognise the correct explanation of a familiar phenomenon and judge whether a conclusion fits the data.

Figure 4. Share of students below Level 2 in science, by school programme, 2022 and 2025.



Source: OECD PISA 2022 and 2025 public use files; author's calculations. 95% confidence intervals from 80 replicate weights and ten plausible values.

In gymnasium the share below Level 2 in science fell from 26% to 8%, in mixed schools from 53% to 38%, and in vocational schools from 66% to 51%. Vocational programmes hold just over half of the cohort, so the national figure follows them: half of these students still lack baseline scientific literacy. The pattern repeats in the other domains. Below Level 2 in mathematics are 16% of gymnasium students and 68% of vocational students; in reading 10% and 57%. At the top, 4.7% of gymnasium students reach Level 5 or above in science, against 0.3% in vocational schools.

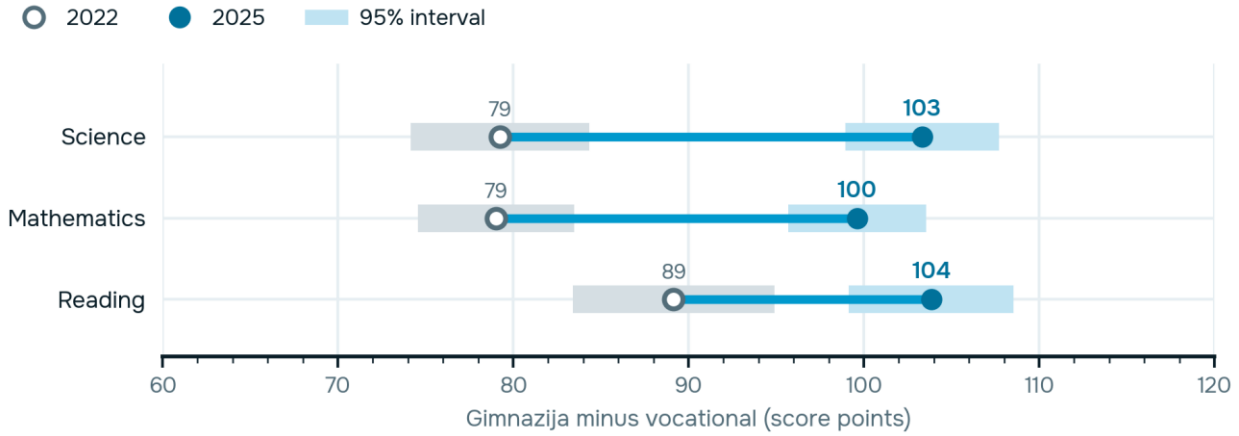
05

The programme divide widened

Gymnasium minus vocational	2022	2025
Science	79 (2.6)	103 (2.2)
Mathematics	79 (2.3)	100 (2.0)
Reading	89 (2.9)	104 (2.4)
Science, adjusted for student ESCS	67	89

Score-point differences; standard errors in parentheses. Source: OECD PISA 2022 and 2025 public use files; author's calculations.

Figure 5. Gap between gymnasium and vocational students, by domain, 2022 and 2025.



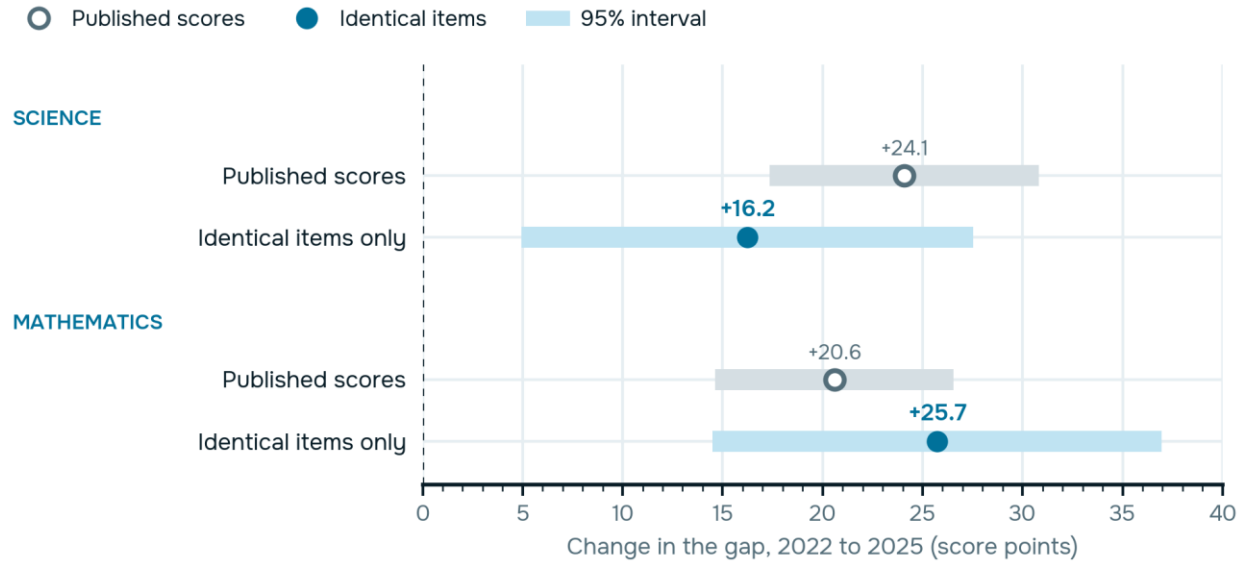
Source: OECD PISA 2022 and 2025 public use files; author's calculations. 95% confidence intervals from 80 replicate weights and ten plausible values.

Both sectors improved on the published scale, gymnasium by about 53 points in science and vocational schools by about 29. Adjusting for the PISA index of economic, social and cultural status (ESCS) reduces the gaps by 13 to 14 points in each domain, to 87 to 91 points. The programme contrast remains large after adjustment for measured student ESCS. This does not isolate a programme effect or remove all family-background differences, but programme is the largest single division in Montenegro's results.

A comparison of published scores across 2022 and 2025 mixes a change in students with a change in method. The OECD revised the imputation model behind the 2025 plausible values, and its own adjudication chapter warns that between-school differences may have been understated in earlier cycles (OECD, 2026c). A programme gap is a between-school difference, so this caveat applies to it directly. The consulted draft does not supply the linking parameters needed here; the final technical report is scheduled for 2027.

The test applied here does not depend on them. Montenegrin students answered 63 science and 143 mathematics items in both cycles that could be used, after removing items whose behaviour changed between cycles. Calibrating those items once, on both cycles together, places the four groups on one scale. On identical items the gap widened by 16 points in science and 26 in mathematics. The approximate standard errors (5.8 and 5.7) combine student-sampling replication and delete-one-item sensitivity, conditional on the retained items and on a score conversion fixed by the 2022 plausible-value gap; they are not the official OECD linking errors. The gap also widens in this common-item model, which does not use the 2025 plausible values. This supports the direction of the published widening (24 and 21 points), but does not quantify how much the revised imputation method contributes to it.

Figure 6. Change in the gymnasium-vocational gap from 2022 to 2025: published scores and identical items.



Source: OECD PISA 2022 and 2025 public use files; author's calculations. Published change: sampling error only (the official link error is not yet released). Identical items: sampling error and item-sampling sensitivity combined, conditional on the retained items and the score conversion. 95% intervals.

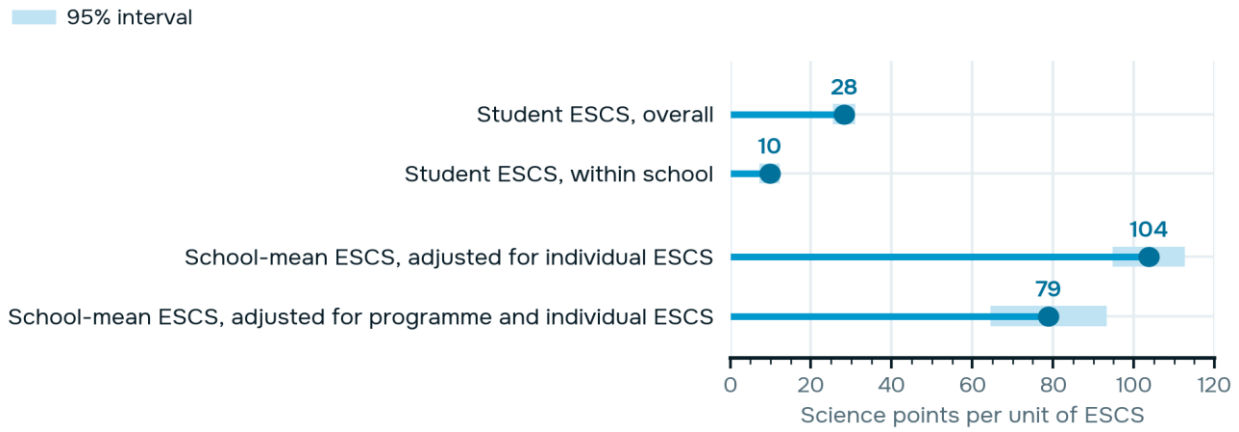
06

Socio-economic status, at student and school level

By international standards, socio-economic status is a weaker predictor of performance in Montenegro than in most OECD countries. The ESCS index accounts for 8% of the variation in science scores (OECD average 12%); a one-unit difference in ESCS is associated with 28 points (OECD 36); and the most advantaged quarter of students outscores the least advantaged quarter by 65 points (OECD 85) (OECD, 2026a). The relationship has nonetheless strengthened, from 5% of variance in 2015 to 8% in 2025.

National averages conceal where that relationship operates. About a third of the variation in science scores lies between schools (34%, against 32% across the OECD), and a regression that includes both a student's own ESCS and the average ESCS of the student's school shows a much stronger association at the school level. Within a school, a one-unit difference in a student's ESCS is associated with 10 points. Holding a student's own ESCS constant, a one-unit difference in school-mean ESCS is associated with 104 points, or 79 after accounting for programme. These are contextual coefficients from survey-weighted regression with predictors at student and school levels.

Figure 7. Science score associated with a one-unit difference in ESCS: the overall student gradient, and the coefficients for individual and school-mean ESCS from contextual regressions.



Source: OECD PISA 2025 public use file; author's calculations. Survey-weighted regressions with 80 replicate weights and ten plausible values; school-mean ESCS re-estimated in each replicate; 95% intervals.

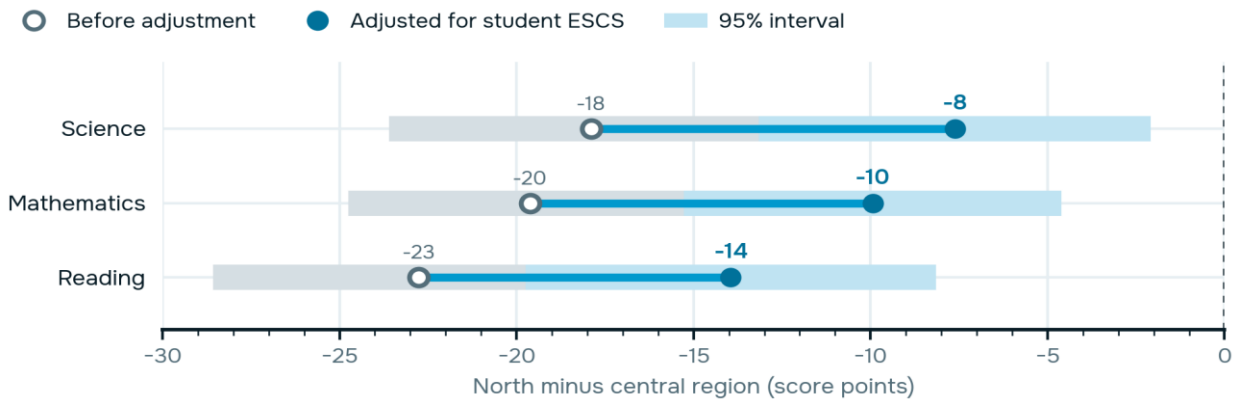
These coefficients are not causal effects of a school's intake. They describe a system in which social background is sorted into schools and the schools then differ widely in results. Gymnasium students come from more advantaged families on average, but the association with school composition remains large after programme is accounted for. These associations do not show whether measures aimed at schools would be more effective than measures aimed at families.

07

Regions

Students in the north score 18 points below the central region in science, 20 in mathematics and 23 in reading. After adjustment for student ESCS the gaps fall to 8, 10 and 14 points. Students in the south score 15 points above the centre in science. The north-central differences are much smaller than the programme differences and are reduced after adjustment for student ESCS, although substantial differences remain, especially in reading. This adjustment does not establish why regional differences arise.

Figure 8. North minus central region, by domain, before and after adjustment for socio-economic status, 2025.



Source: OECD PISA 2025 public use file; author's calculations. Regions from the explicit sampling strata. 95% intervals.

08

Girls and boys

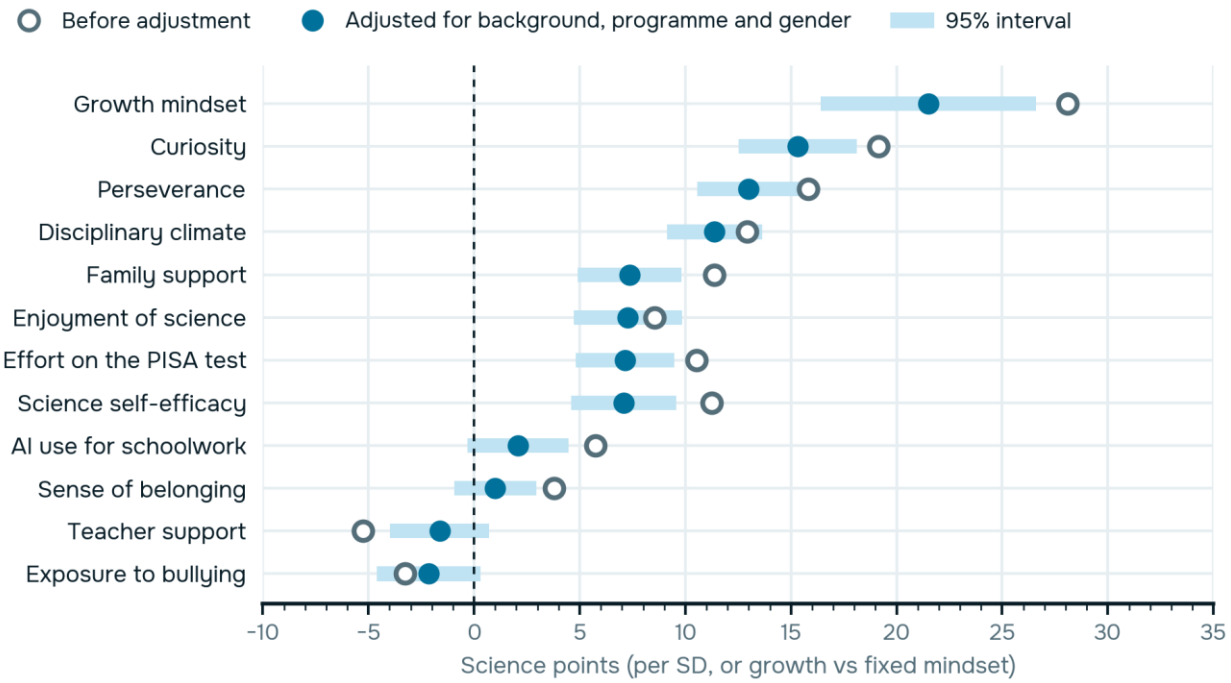
Girls outperform boys by 41 points in reading and by 12 points in science; in mathematics there is no statistically detectable gender difference before adjustment. After adjustment for ESCS and programme, girls lead by 36 points in reading and 7 in science, and trail by 5 in mathematics. The estimated reading gap rose from 36 points in 2022 to 41 in 2025. The 5.4-point change is uncertain (SE 3.3; approximate 95% interval -1.0 to 11.9, before additional linking uncertainty). The revised imputation method may also affect small gender-gap changes; no common-reading-item check was conducted here.

09

Attitudes and learning

The PISA 2025 questionnaire measured how students think about learning and how they experience school. The associations below are with science scores, first on their own and then with statistical adjustment for socio-economic status, programme and gender. They are associations, not effects: a curious student may score higher because curiosity helps learning, because success breeds curiosity, or both.

Figure 9. Science score associated with students' attitudes and school experiences, before and after adjustment for background, programme and gender, 2025.



Source: OECD PISA 2025 public use file; author's calculations. Indices standardised within Montenegro (points per standard deviation); growth mindset compares students who reject the statement that intelligence is fixed with those who accept it. 95% intervals.

Two thirds of students who answered (67%) reject the statement that intelligence is fixed: 73% in gymnasium and 67% in vocational schools. These students score 28 points higher in science, and 21.5

points higher after adjustment for ESCS, programme and gender, close to the 18 points the OECD reports for Montenegro with a different set of controls (OECD, 2026b). Curiosity (15 points per standard deviation, adjusted), perseverance (13) and an orderly disciplinary climate in science lessons (11) follow. Science self-efficacy, enjoyment of science, family support and the effort students reported putting into the test are each associated with about 7 points. Sense of belonging, exposure to bullying, reported teacher support and the use of AI tools for schoolwork show no clear association with science scores after adjustment.

Two of these deserve a note. Reported effort is positively associated with scores. This is consistent with motivation contributing to test performance, but the association does not establish its causal contribution or exclude the influence of students' perceived success on their effort reports. And reported teacher support is negatively associated with scores before adjustment and shows no clear association after it, a pattern consistent with teachers giving more support in classes that need it.

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What follows

The national science average improved, to a level never reached before, and Montenegro is closer to the OECD than ever, while differences between school programmes widened. Reducing the share of vocational students below Level 2 is a clear monitoring target. The concentration of disadvantage in particular schools makes those schools an important focus for further diagnosis and support, but these associations do not establish whether school-based measures would be more effective than family-based measures. Repeated national assessments on a defensibly linked scale could monitor changes in these outcomes; evaluation designs would be needed to attribute changes to policy. The companion report examines, at the level of individual test items, whether the programme gap is tied to particular kinds of task.

Data and methods

OECD PISA 2006 to 2025 published results (OECD, 2026a, 2026b) and the PISA 2022 and 2025 public use files (student questionnaire and cognitive item files). Means, gaps, shares and regressions use the final student weights; standard errors use the 80 Fay-adjusted replicate weights with pooling over ten plausible values, and intervals are approximate (normal-theory 95%). School programme and region are taken from the explicit sampling strata the OECD publishes for Montenegro. The five 2025 national figures checked against the country note (three means, the ESCS quartile gap and the share of variance explained) agreed at the reported precision, as did the student-level ESCS gradient of 28.3 points.

The contextual socio-economic model regresses science on student ESCS and the weighted mean ESCS of the student's school, with and without programme indicators; the school means are re-estimated with each replicate weight. Covariate models standardise each index within Montenegro and add ESCS, programme and gender as controls; the growth mindset indicator is disagreement with the statement that intelligence is fixed. The same-items test uses a concurrent generalised partial credit model fitted to the common items of both cycles, with items that drift between cycles removed by a uniform DIF scan (16 in science, 14 in mathematics), gaps expressed on the 2022 plausible-value metric, and approximate standard errors that combine 160 replicate refits with a delete-one-item jackknife, conditional on the retained items and the score conversion. It compares gaps within each cycle and is not used to compare score levels between cycles.



ABOUT THIS REPORT

Independent analysis of the OECD's public PISA microdata. Analysis code and tables are available from the author.

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