ANNEX D

Snapshot of trends in reading, mathematics and science performance

Snapshot of trends in reading, mathematics and science performance

Snapshot of performance trends in **ALBANIA**

Mean performance	Reading	Mathematics	Science
PISA 2000	349*		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	385*	377*	391*
PISA 2012	394*	394*	397*
PISA 2015	405	413*	427*
PISA 2018	405	437	417
Average 3-year trend in mean performance	+10.5*	+19.8*	+10.7*
Short-term change in mean performance (2015 to 2018)	+0.2	+24.1*	-10.5*
Overall performance trajectory	positive, but flattening (less positive over more recent years)	improving	improving
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2009 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.2	+1.5*	+0.1
Percentage-point change in low-achieving students (below Level 2)	-4.4	-18.3*	-10.3*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2009 to 2018)**	**Science (2009 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+7.9*	+16.7*	+4.1
Average trend amongst the lowest-achieving students (10th percentile)	+14.4*	+24.0*	+19.7*
Gap in learning outcomes between the highest- and lowest-achieving students	narrowing gap	narrowing gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Albania, mean performance improved, from initially low levels, across all three subjects (reading, mathematics and science). In all three subjects, improvements at the bottom of the performance distribution outpaced improvements observed at the top, resulting in narrowing performance gaps between the highest- and lowest-achieving students. Improvements in mean performance were particularly rapid in mathematics (about 20 points, on average, per 3-year period). The proportion of students who scored below Level 2 in mathematics (low-achieving students) shrank by 18 percentage points between 2012 and 2018.

Improvements in performance in Albania were even more remarkable when considering that enrolment rates of 15-year-olds in grade 7 and above increased between 2009 and 2018 (Table I.A2.2).

Snapshot of performance trends in **ARGENTINA**

Mean performance	Reading	Mathematics	Science
PISA 2000	418		
PISA 2003	m	m	
PISA 2006	374*	381	391
PISA 2009	398	388	401
PISA 2012	396	388	406
PISA 2015	m	m	m
PISA 2018	402	379	404
Average 3-year trend in mean performance	-1.2	-1.0	+3.0
Short-term change in mean performance (2015 to 2018)	m	m	m
Overall performance trajectory	U-shaped (more positive over more recent years)	stable	stable

Proficiency levels	Reading (2009 to 2018)	Mathematics (2012 to 2018)	Science (2006 to 2018)
Percentage-point change in top-performing students (Level 5 or 6)	-0.3	+0.1	+0.0
Percentage-point change in low-achieving students (below Level 2)	+0.5	+2.5	-2.8

Variation in performance	Reading (2000 to 2018)	Mathematics (2009 to 2018)	Science (2006 to 2018)
Average trend amongst the highest-achieving students (90th percentile)	-4.3*	-5.6*	-0.0
Average trend amongst the lowest-achieving students (10th percentile)	+4.4	+5.3*	+8.3*
Gap in learning outcomes between the highest- and lowest-achieving students	narrowing gap	narrowing gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean mathematics and science performance remained stable in Argentina over the 2006-2018 period. In reading, performance improved over this period after an initial decline between 2001 and 2006.

The gap between the highest- and lowest-achieving students narrowed in all three subjects. This means that in reading, mathematics and science, trends were significantly more positive at the bottom of the performance distribution (with the 10th percentile moving up by more than 5 points per 3-year period in mathematics and science) than at the top of the performance distribution (with the 90th percentile moving down by more than 4 points per 3-year period in reading and mathematics).

PISA 2015 results for Argentina cannot be compared to results from previous years or to results from 2018 due to the use of an incomplete sampling frame. Indeed, PISA 2015 results represented only 55% of the country's population of 15-year-olds, compared to about 80% in PISA 2006, 2012 and 2018.

Snapshot of performance trends in **AUSTRALIA**

Mean performance	Reading	Mathematics	Science
PISA 2000	528*		
PISA 2003	525*	524*	
PISA 2006	513	520*	527*
PISA 2009	515*	514*	527*
PISA 2012	512*	504*	521*
PISA 2015	503	494	510*
PISA 2018	503	491	503
Average 3-year trend in mean performance	-4.4*	-7.2*	-6.5*
Short-term change in mean performance (2015 to 2018)	-0.3	-2.5	-7.0*
Overall performance trajectory	steadily negative	steadily negative	increasingly negative
Proficiency levels	**Reading** **(2009 to 2018)**	**Mathematics** **(2012 to 2018)**	**Science** **(2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.3	-4.3*	-5.1*
Percentage-point change in low-achieving students (below Level 2)	+5.4*	+2.8	+6.0*
Variation in performance	**Reading** **(2000 to 2018)**	**Mathematics** **(2003 to 2018)**	**Science** **(2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-2.4	-6.9*	-6.0*
Average trend amongst the lowest-achieving students (10th percentile)	-6.2*	-7.1*	-7.6*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean performance in Australia has been steadily declining in reading (between 2000 and 2018) and in mathematics (between 2003 and 2018), from initially high levels of performance; it has been declining in science too, at least since 2012. In reading, more rapid declines were observed amongst the country's lowest-achieving students. In mathematics and science, performance declined to a similar extent at the top and at the bottom of the performance distribution, as well as on average.

The proportion of top-performing students (scoring at Level 5 or 6) remained stable in reading (between 2009 and 2018), but decreased in mathematics (between 2012 and 2018) and in science (between 2006 and 2018). Meanwhile, the proportion of low-achieving students (scoring below Level 2) increased in all subjects.

Snapshot of performance trends in AUSTRIA

Mean performance	Reading	Mathematics	Science
PISA 2000	492		
PISA 2003	491	506	
PISA 2006	490	505	511*
PISA 2009	m	m	m
PISA 2012	490	506	506*
PISA 2015	485	497	495
PISA 2018	484	499	490
Average 3-year trend in mean performance	-1.3	-1.7	-5.5*
Short-term change in mean performance (2015 to 2018)	-0.5	+2.2	-5.3
Overall performance trajectory	flat	flat	declining
Proficiency levels	**Reading (2012 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+1.9*	-1.7	-3.7*
Percentage-point change in low-achieving students (below Level 2)	+4.1*	+2.4	+5.5*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-1.3	-2.3	-5.1*
Average trend amongst the lowest-achieving students (10th percentile)	-0.9	-1.7	-4.7*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Austria's mean performance in reading and mathematics remained stable, around a flat trend line, throughout the country's participation in PISA. In science, performance has been declining since 2006; similar declines were observed amongst the country's highest-achieving and lowest-achieving students. In PISA 2018, the proportion of top-performing students in science (students scoring at Level 5 or 6) was almost 4 percentage points smaller than in 2006.

Snapshot of performance trends in BELGIUM

Mean performance	Reading	Mathematics	Science
PISA 2000	507*		
PISA 2003	507	529*	
PISA 2006	501	520*	510*
PISA 2009	506*	515	507
PISA 2012	509*	515	505
PISA 2015	499	507	502
PISA 2018	493	508	499
Average 3-year trend in mean performance	-1.8	-4.1*	-2.7*
Short-term change in mean performance (2015 to 2018)	-5.7	+1.1	-3.2
Overall performance trajectory	hump-shaped (more negative over more recent years)	negative, but flattening (less negative over more recent years)	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-1.6	-3.8*	-2.0*
Percentage-point change in low-achieving students (below Level 2)	+3.5*	+0.7	+3.0
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-1.8	-6.8*	-2.5*
Average trend amongst the lowest-achieving students (10th percentile)	+1.1	-1.1	-2.2
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	narrowing gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In all three subjects, Belgium's mean performance in PISA 2018 was not significantly different from that observed in 2015. When considering a longer period, the overall trajectory is negative in mathematics and science, and declining, at least since 2012, in reading too.

The decline in mean performance in mathematics, most of which occurred in the earlier period, was mostly the result of declines amongst the highest-achieving students. The 90th percentile of the mathematics performance distribution, i.e. the level above which only 10% of students scored, moved down by about 7 points per 3-year period between 2003 and 2018.

Snapshot of performance trends in **BRAZIL**

Mean performance	Reading	Mathematics	Science
PISA 2000	396*		
PISA 2003	403	356*	
PISA 2006	393*	370*	390*
PISA 2009	412	386	405
PISA 2012	407	389	402
PISA 2015	407	377	401
PISA 2018	413	384	404
Average 3-year trend in mean performance	+2.6	+4.6*	+2.2
Short-term change in mean performance (2015 to 2018)	+5.5	+6.5	+2.9
Overall performance trajectory	flat	positive, but flattening (less positive over more recent years)	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.5	+0.2	+0.2
Percentage-point change in low-achieving students (below Level 2)	+0.4	-0.2	-5.6*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+4.0*	+2.6	+4.0*
Average trend amongst the lowest-achieving students (10th percentile)	+2.6	+7.4*	+1.2
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	narrowing gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Brazil, mean performance in mathematics improved over the 2003-2018 period, but most of that improvement was in the early cycles. After 2009, in mathematics, as in reading and science, mean performance appeared to fluctuate around a flat trend.

The positive early trends (2000-2012) were observed over a period of rapid expansion of secondary education. Between 2003 and 2012, Brazil added more than 500 000 students to the total population of 15-year-olds eligible to participate in PISA. The proportion of 15-year-olds who were covered by PISA samples increased from about 55% in 2003 to 70% in 2012. It is likely that this expansion in education opportunities dampened an even more positive underlying trend in student performance. Indeed, a simulation that assumes that the highest-scoring 25% of 15-year-olds were eligible to take the test in any given year shows a positive trend amongst this population not only in mathematics (2003-2018), but also in science (2006-2018) (Figure I.9.5).

Snapshot of performance trends in BULGARIA

Mean performance	Reading	Mathematics	Science
PISA 2000	430		
PISA 2003	m	m	
PISA 2006	402	413*	434
PISA 2009	429	428	439
PISA 2012	436*	439	446*
PISA 2015	432	441	446*
PISA 2018	420	436	424
Average 3-year trend in mean performance	+0.8	+5.9*	-1.4
Short-term change in mean performance (2015 to 2018)	-11.9	-5.1	-21.7*
Overall performance trajectory	flat	positive, but flattening (less positive over more recent years)	hump-shaped (more negative over more recent years)

Proficiency levels	Reading (2009 to 2018)	Mathematics (2012 to 2018)	Science (2006 to 2018)
Percentage-point change in top-performing students (Level 5 or 6)	-0.4	+0.2	-1.5*
Percentage-point change in low-achieving students (below Level 2)	+6.1	+0.7	+3.9

Variation in performance	Reading (2000 to 2018)	Mathematics (2006 to 2018)	Science (2006 to 2018)
Average trend amongst the highest-achieving students (90th percentile)	+1.8	+5.4*	-4.6*
Average trend amongst the lowest-achieving students (10th percentile)	+0.9	+6.2*	+2.0
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Bulgaria, mean performance in reading remained stable, around a flat trend line, throughout the country's participation in PISA (2001-2018). In mathematics, performance improved between 2006 and 2018, but the improvement was concentrated in the early years (2006-2012). In science, performance in 2018 fell below the level observed in 2012 and 2015. The drop in mean science performance between PISA 2015 and PISA 2018 is one of the largest observed over this (short) period amongst all PISA-participating countries and economies.

Snapshot of performance trends in CANADA

Mean performance	Reading	Mathematics	Science
PISA 2000	534*		
PISA 2003	528	532*	
PISA 2006	527	527*	534*
PISA 2009	524	527*	529*
PISA 2012	523	518	525
PISA 2015	527	516	528*
PISA 2018	520	512	518
Average 3-year trend in mean performance	-1.7	-4.1*	-3.4*
Short-term change in mean performance (2015 to 2018)	-6.6	-3.6	-9.7*
Overall performance trajectory	flat	steadily negative	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+2.2	-1.1	-3.1*
Percentage-point change in low-achieving students (below Level 2)	+3.5*	+2.4	+3.4*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-0.3	-2.9*	-2.0
Average trend amongst the lowest-achieving students (10th percentile)	-2.8*	-5.5*	-4.3*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	widening gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Canada, performance declined in mathematics (since 2003) and in science (since 2006) by about 10 score points or more per decade (4.1 score points per 3-year period in mathematics, and 3.4 score points per 3-year period in science). In reading, no significant overall direction of the trend could be determined, and performance remained at least 20 points above the OECD average performance in every PISA year. However, the share of low-achieving students increased between 2009 and 2018 by 3.5 percentage points and, as is observed in mathematics too, more rapid declines were observed amongst the lowest-achieving students than amongst the highest-achieving students, resulting in a widening of performance gaps.

Snapshot of performance trends in CHILE

Mean performance	Reading	Mathematics	Science
PISA 2000	410*		
PISA 2003	m	m	
PISA 2006	442	411	438
PISA 2009	449	421	447
PISA 2012	441*	423	445
PISA 2015	459	423	447
PISA 2018	452	417	444
Average 3-year trend in mean performance	+7.1*	+1.4	+1.1
Short-term change in mean performance (2015 to 2018)	-6.3	-5.3	-3.4
Overall performance trajectory	positive, but flattening (less positive over more recent years)	hump-shaped (more negative over more recent years)	flat
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+1.3*	-0.4	-0.9*
Percentage-point change in low-achieving students (below Level 2)	+1.2	+0.4	-4.4
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+6.2*	+0.9	-0.7
Average trend amongst the lowest-achieving students (10th percentile)	+8.1*	+0.9	+1.9
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Reading performance in Chile improved since the country's first participation in PISA (in 2001). However, most of that improvement occurred in the early period. Between 2009 and 2018, no significant trends in performance were observed in any subject.

Despite stable overall performance, the proportion of students performing at Level 5 or above (top performers) in reading grew between 2009 and 2018 (+1.3 percentage points) and shrank in science between 2006 and 2018 (-0.9 of a percentage point).

Snapshot of performance trends in COLOMBIA

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	385*	370*	388*
PISA 2009	413	381	402
PISA 2012	403	376*	399*
PISA 2015	425*	390	416
PISA 2018	412	391	413
Average 3-year trend in mean performance	+6.6*	+5.1*	+6.4*
Short-term change in mean performance (2015 to 2018)	-12.6*	+1.3	-2.4
Overall performance trajectory	positive, but flattening (less positive over more recent years)	steadily positive	steadily positive
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.4	+0.2	+0.3*
Percentage-point change in low-achieving students (below Level 2)	+2.8	-8.4*	-9.8*
Variation in performance	**Reading (2006 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+4.5*	+4.9*	+7.3*
Average trend amongst the lowest-achieving students (10th percentile)	+12.0*	+7.2*	+8.0*
Gap in learning outcomes between the highest- and lowest-achieving students	narrowing gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

While Colombia's performance in reading in PISA 2018 was below that observed in 2015, when considering a longer period, mean performance improved in all subjects – including reading – since the country first participated in PISA in 2006.

Snapshot of performance trends in COSTA RICA

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	443*	409	430*
PISA 2012	441*	407	429*
PISA 2015	427	400	420
PISA 2018	426	402	416
Average 3-year trend in mean performance	-6.8*	-3.0	-6.1*
Short-term change in mean performance (2015 to 2018)	-1.0	+2.1	-4.0
Overall performance trajectory	declining	stable	declining
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2009 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-0.2	-0.2	-0.2
Percentage-point change in low-achieving students (below Level 2)	+9.3*	+0.1	+8.8*
Variation in performance	**Reading (2009 to 2018)**	**Mathematics (2009 to 2018)**	**Science (2009 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-3.7	-1.5	-5.5
Average trend amongst the lowest-achieving students (10th percentile)	-7.6*	-5.0*	-5.2*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Costa Rica first participated in PISA in 2010. While mean performance in mathematics remained stable over the 2010-2018 period, it declined in both reading and science. More specifically, while performance in reading and science was similar between 2009 and 2012, it declined in 2015 and stayed at roughly the same level in 2018. The decline in performance was most acute amongst the lowest-achieving students. The average trend amongst these students was negative and significant in all three subjects (reading, mathematics and science).

However, these decreases in performance took place in the context of an increase in the coverage of the 15-year-old population in Costa Rica, from between 50% and 53% in 2010 and 2012, respectively, to 63% in 2015 and 2018. The inclusion of more 15-year-olds in the assessed population often involves the inclusion of weaker students who would not have been enrolled or who would not have been at the appropriate grade level in earlier rounds of PISA. Once changes in coverage were accounted for, the average trend amongst the median and higher percentiles of 15-year-olds were not significant, although positive. It is therefore possible that the decline in mean performance in Costa Rica was due primarily to increased coverage of the 15-year-old population.

Snapshot of performance trends in CROATIA

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	477	467	493*
PISA 2009	476	460	486*
PISA 2012	485	471	491*
PISA 2015	487	464	475
PISA 2018	479	464	472
Average 3-year trend in mean performance	+1.4	-0.2	-5.3*
Short-term change in mean performance (2015 to 2018)	-7.9	+0.2	-3.0
Overall performance trajectory	flat	flat	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+1.5*	-1.8	-1.5*
Percentage-point change in low-achieving students (below Level 2)	-0.9	+1.3	+8.4*
Variation in performance	**Reading (2006 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+2.9	+0.6	-2.9
Average trend amongst the lowest-achieving students (10th percentile)	+1.4	-0.9	-7.4*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In reading and mathematics, mean performance in Croatia remained stable, around a flat trend line, throughout the country's participation in PISA (2006-2018). In science, mean performance declined over this same period by about 5 score points on average per 3-year period. Performance declines in science were particularly pronounced amongst the country's lowest-achieving students. The proportion of students scoring below Level 2 in science increased by about 8 percentage points over that observed in PISA 2006.

Snapshot of performance trends in CYPRUS

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	m	m	m
PISA 2012	449*	440*	438
PISA 2015	443*	437*	433*
PISA 2018	424	451	439
Average 3-year trend in mean performance	-12.2*	+5.7*	+0.7
Short-term change in mean performance (2015 to 2018)	-18.5*	+13.6*	+6.4*
Overall performance trajectory	declining	improving	stable
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2009 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-2.2*	+0.7	-0.3
Percentage-point change in low-achieving students (below Level 2)	+10.9*	-5.2*	+0.9
Variation in performance	**Reading (2009 to 2018)**	**Mathematics (2009 to 2018)**	**Science (2009 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-14.7*	+5.6*	+0.7
Average trend amongst the lowest-achieving students (10th percentile)	-0.7	+2.6	+3.1
Gap in learning outcomes between the highest- and lowest-achieving students	narrowing gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Cyprus participated in PISA for the third time in 2018. Mean reading performance declined over time, while mathematics performance improved between 2012 and 2018 and science performance returned close to the level observed in 2012.

Snapshot of performance trends in the CZECH REPUBLIC

Mean performance	Reading	Mathematics	Science
PISA 2000	492		
PISA 2003	489	516*	
PISA 2006	483	510	513*
PISA 2009	478*	493	500
PISA 2012	493	499	508*
PISA 2015	487	492	493
PISA 2018	490	499	497
Average 3-year trend in mean performance	+0.1	-3.7*	-4.0*
Short-term change in mean performance (2015 to 2018)	+3.0	+7.1	+4.0
Overall performance trajectory	U-shaped (more positive over more recent years)	negative, but flattening (less negative over more recent years)	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+3.1*	-0.2	-4.1*
Percentage-point change in low-achieving students (below Level 2)	-2.3	-0.6	+3.2
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+0.7	-5.9*	-4.9*
Average trend amongst the lowest-achieving students (10th percentile)	+0.2	-2.0	-3.2
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In the Czech Republic, mean performance in reading in 2018 was close to the level observed in all other PISA assessments since 2000, except PISA 2009. In mathematics, performance was below that observed in 2003, but above PISA 2015 performance. In science, performance was below that observed in 2006, but not significantly different from that observed in more recent years.

Snapshot of performance trends in DENMARK

Mean performance	Reading	Mathematics	Science
PISA 2000	497		
PISA 2003	492	514	
PISA 2006	494	513	496
PISA 2009	495	503	499
PISA 2012	496	500*	498
PISA 2015	500	511	502*
PISA 2018	501	509	493
Average 3-year trend in mean performance	+1.1	-0.9	-0.4
Short-term change in mean performance (2015 to 2018)	+1.3	-1.7	-9.3*
Overall performance trajectory	flat	U-shaped (more positive over more recent years)	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+3.7*	+1.7	-1.3
Percentage-point change in low-achieving students (below Level 2)	+0.8	-2.3	+0.2
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+0.7	-3.4*	-1.2
Average trend amongst the lowest-achieving students (10th percentile)	+2.2	+1.0	+0.2
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	narrowing gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean performance in reading remained stable, around a flat trend line, throughout Denmark's participation in PISA. In mathematics and science too, no overall direction of the trend could be detected; however, in mathematics, a declining trend up to 2012 was followed by a (partial) recovery over the 2012-2018 period, while in science, performance in 2018 was about 9 score points lower, on average, than in 2015. The overall trend in mathematics performance was negative amongst the highest-achieving students (at the 90th percentile).

Snapshot of performance trends in the DOMINICAN REPUBLIC

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	m	m	m
PISA 2012	m	m	m
PISA 2015	358*	328	332
PISA 2018	342	325	336
Average 3-year trend in mean performance	-16.1*	-2.6	+4.0
Short-term change in mean performance (2015 to 2018)	-16.1*	-2.6	+4.0
Overall performance trajectory	declining	stable	stable
Proficiency levels	**Reading (2015 to 2018)**	**Mathematics (2015 to 2018)**	**Science (2015 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.0	+0.0	-0.0
Percentage-point change in low-achieving students (below Level 2)	+6.9*	+0.0	-0.9
Variation in performance	**Reading (2015 to 2018)**	**Mathematics (2015 to 2018)**	**Science (2015 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-17.5*	-0.4	+2.0
Average trend amongst the lowest-achieving students (10th percentile)	-9.4	-6.4	+6.2
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

The Dominican Republic participated in PISA for the second time since 2015. While mathematics and science performance was similar to that observed in 2015, reading performance lay 16 score points below that observed in 2015.

Snapshot of performance trends in ESTONIA

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	501*	515	531
PISA 2009	501*	512*	528
PISA 2012	516	521	541*
PISA 2015	519	520	534
PISA 2018	523	523	530
Average 3-year trend in mean performance	+6.3*	+2.5*	+0.4
Short-term change in mean performance (2015 to 2018)	+3.9	+3.9	-4.1
Overall performance trajectory	steadily positive	steadily positive	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+7.8*	+0.9	+0.7
Percentage-point change in low-achieving students (below Level 2)	-2.3	-0.3	+1.1
Variation in performance	**Reading (2006 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+10.0*	+2.6*	+2.1
Average trend amongst the lowest-achieving students (10th percentile)	+3.7*	+2.2	-1.3
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean reading and mathematics performance in Estonia improved steadily since the country first participated in PISA in 2006. Over this same period (2006-2018), performance in science remained mostly stable (and high). The improvement in reading performance was particularly marked at the top of the performance distribution: the 90th percentile moved up on the PISA scale by about 10 points every 3 years and, between 2009 and 2018, the proportion of student scoring at Level 5 or 6 (top performers) increased by almost 8 percentage points.

Snapshot of performance trends in FINLAND

Mean performance	Reading	Mathematics	Science
PISA 2000	546*		
PISA 2003	543*	544*	
PISA 2006	547*	548*	563*
PISA 2009	536*	541*	554*
PISA 2012	524	519*	545*
PISA 2015	526	511	531*
PISA 2018	520	507	522
Average 3-year trend in mean performance	-4.9*	-9.1*	-10.7*
Short-term change in mean performance (2015 to 2018)	-6.3	-3.8	-8.8*
Overall performance trajectory	steadily negative	increasingly negative	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-0.3	-4.1*	-8.6*
Percentage-point change in low-achieving students (below Level 2)	+5.4*	+2.7*	+8.8*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-1.5	-9.3*	-7.2*
Average trend amongst the lowest-achieving students (10th percentile)	-8.6*	-9.7*	-15.5*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean reading, mathematics and science performance continued to decline in Finland. In all three subjects the decline began after 2006. Although PISA 2018 results were significantly lower than PISA 2015 results only in science, there was no sign of a flattening or reversing trend in any subject. In mathematics, declines were similarly rapid at all levels of the performance distribution; in reading and science, in contrast, the declining trend was particularly noticeable amongst the lowest-achieving students. The proportion of top-performing students in mathematics shrank by 4 percentage points between 2012 and 2018, while the proportion of top-performing students in science decreased by 9 percentage points between 2006 and 2018. Meanwhile, the proportion of low-achieving students in reading grew by 5 percentage points between 2009 and 2018; the proportion of low-achieving students in mathematics grew by 3 percentage points between 2012 and 2018; and the share of low performers in science increased by 9 percentage points between 2006 and 2018.

Snapshot of performance trends in FRANCE

Mean performance	Reading	Mathematics	Science
PISA 2000	505*		
PISA 2003	496	511*	
PISA 2006	488	496	495
PISA 2009	496	497	498
PISA 2012	505*	495	499
PISA 2015	499	493	495
PISA 2018	493	495	493
Average 3-year trend in mean performance	-0.4	-2.5*	-0.8
Short-term change in mean performance (2015 to 2018)	-6.7	+2.5	-2.0
Overall performance trajectory	flat	negative, but flattening (less negative over more recent years)	flat
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-0.4	-1.9	-1.5
Percentage-point change in low-achieving students (below Level 2)	+1.2	-1.1	-0.7
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+3.0*	-2.8*	-1.7
Average trend amongst the lowest-achieving students (10th percentile)	-4.0*	-3.1*	+0.7
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean science performance in France remained stable over the 2006-2018 period; similarly, no overall direction of change can be determined for mean reading performance over the 2000-2018 period. Mathematics performance declined between 2003 and 2018, but most of that decline was observed in earlier assessments; the recent trend is flat in mathematics too.

In reading, the apparent stability hides distinct trends amongst students at different levels in the performance distribution. Amongst the lowest-achieving students, performance tended to decline (by 4 score points, on average, per 3-year period); whereas amongst the highest-achieving students, performance tended to improve (by 3 score points, on average, per 3-year-period). No such widening of performance gaps was observed in mathematics (where a similar decline was observed amongst the highest-and lowest-achieving students, on average) and science.

Snapshot of performance trends in GEORGIA

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	374	379*	373
PISA 2012	m	m	m
PISA 2015	401*	404	411*
PISA 2018	380	398	383
Average 3-year trend in mean performance	+3.5	+7.6*	+5.6*
Short-term change in mean performance (2015 to 2018)	-21.5*	-6.2	-28.5*
Overall performance trajectory	stable	improving	improving
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2009 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-0.1	m	-0.1
Percentage-point change in low-achieving students (below Level 2)	+2.4	m	-1.2
Variation in performance	**Reading (2009 to 2018)**	**Mathematics (2009 to 2018)**	**Science (2009 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+0.5	+11.2*	+3.4
Average trend amongst the lowest-achieving students (10th percentile)	+11.6*	+5.9*	+10.6*
Gap in learning outcomes between the highest- and lowest-achieving students	narrowing gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

PISA 2018 results in Georgia were significantly below those observed in 2015 in reading and science, reversing most of the gains observed between 2010 and 2015. Only mathematics results in PISA 2018 remained significantly above the level observed in 2010.

Snapshot of performance trends in GERMANY

Mean performance	Reading	Mathematics	Science
PISA 2000	484*		
PISA 2003	491	503	
PISA 2006	495	504	516*
PISA 2009	497	513*	520*
PISA 2012	508	514*	524*
PISA 2015	509	506	509
PISA 2018	498	500	503
Average 3-year trend in mean performance	+3.3*	-0.1	-3.6*
Short-term change in mean performance (2015 to 2018)	-10.8	-5.9	-6.2
Overall performance trajectory	positive, but flattening (less positive over more recent years)	hump-shaped (more negative over more recent years)	negative, and more so over more recent years
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+3.7*	-4.1*	-1.8
Percentage-point change in low-achieving students (below Level 2)	+2.2	+3.4*	+4.2*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+1.9	-2.8*	-2.6
Average trend amongst the lowest-achieving students (10th percentile)	+5.8*	+2.8	-4.2*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	narrowing gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Germany, mean reading and mathematics performance in 2018 returned close to levels that were last observed in 2006 or 2009, reversing most of the gains observed over the early period (up to 2012); in science, mean performance was below 2006 levels. PISA 2018 results lay significantly below PISA 2012 results in mathematics.

The recent trajectory of mean reading performance could be partly related to the changing composition of the student population. It could be estimated that, if the student population in 2015 had had the same demographic profile as the population in 2018, the average score in reading would have been 505 points (Table I.B1.40), or about 5 score points below the average observed score (Table I.B1.10). However, demographic changes account only for a small part of the larger negative trends observed in mathematics and science since 2012.

In mathematics, while there was no overall trend in mean performance over the full 2003-2018 period, the trend was negative amongst the highest-achieving students (those at the 90th percentile).

Over the most recent period, performance trends in Germany differed by gender. Between 2015 and 2018, girls' performance in mathematics and science remained stable, while mean score amongst boys declined by 11 points in mathematics and by 12 points in science (Tables II.B1.7.36 and II.B1.7.42 in *PISA 2018 Results [Volume II]: Where All Students Can Succeed*).

Snapshot of performance trends in GREECE

Mean performance	Reading	Mathematics	Science
PISA 2000	474*		
PISA 2003	472	445	
PISA 2006	460	459	473*
PISA 2009	483*	466*	470*
PISA 2012	477*	453	467*
PISA 2015	467	454	455
PISA 2018	457	451	452
Average 3-year trend in mean performance	-1.5	+0.1	-5.9*
Short-term change in mean performance (2015 to 2018)	-9.6	-2.3	-3.2
Overall performance trajectory	hump-shaped (more negative over more recent years)	hump-shaped (more negative over more recent years)	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-2.0*	-0.2	-2.1*
Percentage-point change in low-achieving students (below Level 2)	+9.2*	+0.1	+7.7*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-1.5	-0.8	-6.4*
Average trend amongst the lowest-achieving students (10th percentile)	-0.8	+0.5	-5.3*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean science performance in Greece declined steadily since 2006, by an average of 5.9 score points per 3-year period, even though changes from one round to the next were not always statistically significant. Performance in mathematics can be described as hump-shaped, mainly due to a spike in performance in PISA 2009; performance in other years was stable. Similarly, mean reading performance can be described as hump-shaped, with a steady decline in performance since its peak in 2009. Greece performed below the OECD average in all subjects in every year it participated in PISA.

The decline in science performance over the 2006-2018 period was observed across the performance distribution. Performance amongst the highest-achieving students declined by 6.4 percentage points and that amongst the lowest-achieving students fell by 5.3 percentage points per 3-year period.

Snapshot of performance trends in HONG KONG (CHINA)

Mean performance	Reading	Mathematics	Science
PISA 2000	525		
PISA 2003	510	550	
PISA 2006	536	547	542*
PISA 2009	533	555	549*
PISA 2012	545*	561	555*
PISA 2015	527	548	523
PISA 2018	524	551	517
Average 3-year trend in mean performance	+1.6	+0.4	-7.7*
Short-term change in mean performance (2015 to 2018)	-2.4	+3.2	-6.6
Overall performance trajectory	hump-shaped (more negative over more recent years)	flat	increasingly negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+2.4	-4.7*	-8.1*
Percentage-point change in low-achieving students (below Level 2)	+4.3*	+0.7	+2.8*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+4.8*	-1.0	-9.6*
Average trend amongst the lowest-achieving students (10th percentile)	-1.5	+1.6	-5.4*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Hong Kong (China), mean reading, mathematics and science performance in 2018 was close to the level observed in 2015. When considering a longer period, reading performance in 2015-2018 was below PISA 2012 levels, but not significantly different from 2009 or 2002, the previous years in which reading was the major focus of the assessment. Science performance was below the level observed over the 2006-2012 period, while mathematics performance appeared stable, fluctuating around a flat trend over the 2003-2018 period.

The apparent stability in reading performance between 2002, 2009 and 2018, however, hides widening performance gaps between the highest- and the lowest-achieving students. No similar widening of performance gaps was observed in either mathematics or science.

In reading, the proportion of students scoring below Level 2 (low-achieving students) increased by 4 percentage points between 2009 and 2018. In science, the proportion of top-performing students decreased by 8 percentage points between 2006 and 2018.

Snapshot of performance trends in HUNGARY

Mean performance	Reading	Mathematics	Science
PISA 2000	480		
PISA 2003	482	490	
PISA 2006	482	491*	504*
PISA 2009	494*	490	503*
PISA 2012	488*	477	494*
PISA 2015	470	477	477
PISA 2018	476	481	481
Average 3-year trend in mean performance	-1.1	-2.8*	-7.1*
Short-term change in mean performance (2015 to 2018)	+6.5	+4.3	+4.2
Overall performance trajectory	hump-shaped (more negative over more recent years)	steadily negative	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-0.4	-1.3	-2.2*
Percentage-point change in low-achieving students (below Level 2)	+7.7*	-2.4	+9.1*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+0.3	-3.0*	-3.6*
Average trend amongst the lowest-achieving students (10th percentile)	-2.4	-3.7*	-10.6*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Hungary's average performance in reading in 2018 was close to its level in 2000, when the country first participated in PISA; but as is also observed in science and to a lesser extent in mathematics, the more recent trend, after 2009, was negative. In particular, the proportion of low-achieving students (students scoring below Level 2) increased by about 8 percentage points in reading (2009-2018) and by about 9 percentage points in science (2006-2018).

Snapshot of performance trends in ICELAND

Mean performance	Reading	Mathematics	Science
PISA 2000	507*		
PISA 2003	492*	515*	
PISA 2006	484	506*	491*
PISA 2009	500*	507*	496*
PISA 2012	483	493	478
PISA 2015	482	488*	473
PISA 2018	474	495	475
Average 3-year trend in mean performance	-4.4*	-4.7*	-5.4*
Short-term change in mean performance (2015 to 2018)	-7.6	+7.2*	+1.8
Overall performance trajectory	steadily negative	negative, but flattening (less negative over more recent years)	steadily negative

Proficiency levels	Reading (2009 to 2018)	Mathematics (2012 to 2018)	Science (2006 to 2018)
Percentage-point change in top-performing students (Level 5 or 6)	-1.4	-0.8	-2.5*
Percentage-point change in low-achieving students (below Level 2)	+9.5*	-0.8	+4.4*

Variation in performance	Reading (2000 to 2018)	Mathematics (2003 to 2018)	Science (2006 to 2018)
Average trend amongst the highest-achieving students (90th percentile)	-1.7	-4.1*	-6.1*
Average trend amongst the lowest-achieving students (10th percentile)	-6.5*	-5.6*	-3.8*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean performance in all three subjects declined over Iceland's participation in PISA by about 5 score points per 3-year period, on average. While, in mathematics, mean performance in 2018 was higher than that observed in 2015, reversing some earlier losses, this was not observed in reading or in science. Performance in reading declined amongst the country's lowest-achieving students (at the 10th percentile), while no decline was observed amongst the highest-achieving students (at the 90th percentile). The proportion of students who scored below Level 2 in reading increased by 9.5 percentage points between 2009 and 2018.

Snapshot of performance trends in INDONESIA

Mean performance	Reading	Mathematics	Science
PISA 2000	371		
PISA 2003	382	360*	
PISA 2006	393*	391	393
PISA 2009	402*	371	383*
PISA 2012	396*	375	382*
PISA 2015	397*	386	403
PISA 2018	371	379	396
Average 3-year trend in mean performance	+1.2	+2.2	+2.5
Short-term change in mean performance (2015 to 2018)	-26.3*	-7.4	-7.0
Overall performance trajectory	hump-shaped (more negative over more recent years)	hump-shaped (more negative over more recent years)	flat
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.0	+0.2	+0.0
Percentage-point change in low-achieving students (below Level 2)	+16.5*	-3.8	-1.6
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+2.1	+1.5	+1.9
Average trend amongst the lowest-achieving students (10th percentile)	+1.2	+2.7	+3.0*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Indonesia has participated in PISA since 2001. Since that time, performance in science has fluctuated but remained flat overall, while performance in both reading and mathematics has been hump-shaped. Reading performance in 2018 fell back to its 2001 level after a peak in 2009, while mathematics performance fluctuated more in the early years of PISA but remained relatively stable since 2009.

However, these results must be seen in the context of the vast strides that Indonesia has made in increasing enrolment. In 2003, the PISA sample covered only 46% of 15-year-olds in Indonesia; in 2018, 85% of 15-year-olds were covered. It is often the case that the strongest students remain in education, and that students who were not in education and were brought into the school system are weaker than those who were already included. If there had been no improvement in the education system, the inclusion of more students would be expected to lower mean performance and the performance distribution. In that light, in maintaining education standards over its participation in PISA, Indonesia has been able to raise the quality of its education system.

Trends adjusted for enrolment show this more clearly. On the assumption that the 15-year-olds who were excluded from the PISA sample would have performed below the 75th percentile of all 15-year-olds if they had sat the assessment, the mathematics and science performance of the highest-achieving 25% amongst all 15-year-olds in Indonesia would have improved by 11 points every three years since 2003 (Tables I.B1.35 and I.B1.36).

Snapshot of performance trends in IRELAND

Mean performance	Reading	Mathematics	Science
PISA 2000	527		
PISA 2003	515	503	
PISA 2006	517	501	508*
PISA 2009	496*	487*	508*
PISA 2012	523	501	522*
PISA 2015	521	504	503
PISA 2018	518	500	496
Average 3-year trend in mean performance	-0.3	+0.1	-3.0*
Short-term change in mean performance (2015 to 2018)	-2.7	-4.1	-6.5
Overall performance trajectory	U-shaped (more positive over more recent years)	U-shaped (more positive over more recent years)	increasingly negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+5.1*	-2.4*	-3.6*
Percentage-point change in low-achieving students (below Level 2)	-5.4*	-1.2	+1.5
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-0.2	-1.8	-5.0*
Average trend amongst the lowest-achieving students (10th percentile)	+0.6	+1.3	-0.7
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	narrowing gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

PISA 2018 results in Ireland were close to their historic average in reading and mathematics, with no significant overall direction of change. While the trajectory of reading and mathematics performance can be described as U-shaped, this is entirely the result of PISA 2009 results, which were significantly below the historic average. Mean performance in all other years was close to that observed in PISA 2018.

In science, the overall trend was negative; in particular, the more recent trend (since 2012) and the trend amongst the highest-performing students was markedly negative. Between 2006 and 2018, the proportion of students who scored at Level 5 or 6 on the PISA scale (top-performing students) decreased by 3.6 percentage points, and the 90th percentile of the performance distribution moved down on the PISA scale by about 5 score points per 3-year period.

Snapshot of performance trends in ISRAEL

Mean performance	Reading	Mathematics	Science
PISA 2000	452		
PISA 2003	m	m	
PISA 2006	439*	442*	454
PISA 2009	474	447*	455
PISA 2012	486*	466	470
PISA 2015	479	470	467
PISA 2018	470	463	462
Average 3-year trend in mean performance	+6.1*	+6.4*	+2.8
Short-term change in mean performance (2015 to 2018)	-8.5	-6.6	-4.4
Overall performance trajectory	positive, but flattening (less positive over more recent years)	positive, but flattening (less positive over more recent years)	flat
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+3.0*	-0.6	+0.6
Percentage-point change in low-achieving students (below Level 2)	+4.5*	+0.6	-3.0
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+8.7*	+5.8*	+2.9
Average trend amongst the lowest-achieving students (10th percentile)	+2.6	+4.4*	+2.0
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Performance improved in reading (since 2001) and mathematics (since 2006) in Israel, although most of that improvement happened in the early period (up to 2012). Since 2012, no significant changes were observed in mathematics performance, while reading performance declined somewhat. Performance in science remained stable throughout the 2006-2018 period.

Over the 2001-2018 period, improvements in reading performance were particularly marked amongst the highest-achieving students. The 90th percentile, i.e. the level above which only 10% of all students scored, increased by 8.7 score points per 3-year period, significantly faster than the 10th percentile. As a result, performance gaps in reading widened.

Snapshot of performance trends in ITALY

Mean performance	Reading	Mathematics	Science
PISA 2000	487*		
PISA 2003	476	466*	
PISA 2006	469	462*	475
PISA 2009	486*	483	489*
PISA 2012	490*	485	494*
PISA 2015	485	490	481*
PISA 2018	476	487	468
Average 3-year trend in mean performance	+0.2	+5.4*	-2.3
Short-term change in mean performance (2015 to 2018)	-8.5	-3.1	-12.5*
Overall performance trajectory	flat	positive, but flattening (less positive over more recent years)	hump-shaped (more negative over more recent years)
Proficiency levels	Reading (2009 to 2018)	Mathematics (2012 to 2018)	Science (2006 to 2018)
Percentage-point change in top-performing students (Level 5 or 6)	-0.5	-0.4	-1.9*
Percentage-point change in low-achieving students (below Level 2)	+2.2	-0.8	+0.6
Variation in performance	Reading (2000 to 2018)	Mathematics (2003 to 2018)	Science (2006 to 2018)
Average trend amongst the highest-achieving students (90th percentile)	+0.4	+4.6*	-4.3*
Average trend amongst the lowest-achieving students (10th percentile)	+0.1	+5.2*	-0.9
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.

Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Italy, mean reading performance in 2018 was below the level observed in PISA 2000 and PISA 2009 (the two prior assessments with reading as the main focus), but close to the level observed in most remaining assessments, and no clear direction of change could be determined. Mean science performance in 2018 was significantly below the level observed over the 2009-2015 period, and returned to a level last observed in 2006. Mean mathematics performance in Italy improved in the early cycles of PISA, then remained stable after 2009.

Over the 2006-2018 period, science performance declined most markedly amongst the highest-achieving students. The 90th percentile of performance in science, i.e. the level above which only 10% of all students scored, declined by 4.3 score points per 3-year period, significantly faster than the 10th percentile. As a result, performance gaps in science narrowed, and the proportion of students who scored at Level 5 or 6 in science (top-performing students) shrank by 1.9 percentage points.

Snapshot of performance trends in JAPAN

Mean performance	Reading	Mathematics	Science
PISA 2000	522*		
PISA 2003	498	534	
PISA 2006	498	523	531
PISA 2009	520*	529	539
PISA 2012	538*	536	547*
PISA 2015	516*	532	538*
PISA 2018	504	527	529
Average 3-year trend in mean performance	+0.8	-0.0	-0.6
Short-term change in mean performance (2015 to 2018)	-12.1*	-5.5	-9.3*
Overall performance trajectory	flat	flat	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-3.2*	-5.3*	-2.0
Percentage-point change in low-achieving students (below Level 2)	+3.2	+0.4	-1.2
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+1.8	-2.7	-2.2
Average trend amongst the lowest-achieving students (10th percentile)	+0.9	+2.9	+2.3
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	narrowing gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean mathematics performance in Japan remained stable over the 2003-2018 period, with no significant improvement or deterioration over any sub-period. However, this apparent stability hides distinct trends amongst students at different levels in the performance distribution. Amongst the highest-achieving students in particular, performance tended to decline (by 2.7 score points, on average, per 3-year period; although this trend is not significantly different from 0, it is significantly different from the trend observed amongst the lowest-achieving students).

While no overall direction of change can be determined for reading and science trends in Japan, mean performance in these subjects has been characterised by significant instability. Results appeared more stable when considering only years in which each subject was assessed fully (2000, 2009 and 2018 for reading; 2006 and 2015 for science), perhaps indicating that some of this instability is related to the change in subject coverage in the "off" years (such changes were particularly marked in PISA cycles prior to 2015). Even so, in reading, the more recent trend (since 2009 or 2015) was clearly negative. In science too, mean performance in 2018 was below Japan's performance in PISA 2012 and 2015.

Similar to mathematics, trends amongst the highest-performing students in science tend to be more negative than amongst the lowest-performing students. This narrowing gap in performance is not observed in reading.

Snapshot of performance trends in JORDAN

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	401*	384*	422
PISA 2009	405*	387*	415*
PISA 2012	399*	386*	409*
PISA 2015	408	380*	409*
PISA 2018	419	400	429
Average 3-year trend in mean performance	+4.0*	+2.5	+0.8
Short-term change in mean performance (2015 to 2018)	+11.0	+19.5*	+20.6*
Overall performance trajectory	increasingly positive	U-shaped (more positive over more recent years)	U-shaped (more positive over more recent years)
Proficiency levels	Reading (2009 to 2018)	Mathematics (2012 to 2018)	Science (2006 to 2018)
Percentage-point change in top-performing students (Level 5 or 6)	+0.0	+0.1	+0.0
Percentage-point change in low-achieving students (below Level 2)	-6.8	-9.2*	-4.0
Variation in performance	Reading (2006 to 2018)	Mathematics (2006 to 2018)	Science (2006 to 2018)
Average trend amongst the highest-achieving students (90th percentile)	+2.6	+3.6*	-0.1
Average trend amongst the lowest-achieving students (10th percentile)	+4.9*	+1.6	+1.1
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Jordan, mean performance improved in all three subjects over the more recent assessments (i.e. since 2012 or 2015), after initially flat or even declining (mathematics) trends between 2006 and 2012 (the overall trajectory of performance, since 2006, is significantly positive only in reading).

However, these positive trends since 2012 were observed during a period in which enrolment rates for 15-year-olds in grade 7 and above did not keep pace with increases in the resident population of 15-year-olds. While the population of 15-year-olds enrolled in grade 7 and above, and represented by PISA samples, remained close to the level observed in 2012, the overall population of 15-year-olds increased by more than 25% over the same period, largely as a result of a massive influx of refugees from neighbouring countries. Refugee children may be enrolled outside of Jordan's formal education system.

Snapshot of performance trends in KAZAKHSTAN

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	390	405*	400
PISA 2012	393	432	425*
PISA 2015	m	m	m
PISA 2018	387	423	397
Average 3-year trend in mean performance	-1.4	+4.7*	-2.9
Short-term change in mean performance (2015 to 2018)	m	m	m
Overall performance trajectory	stable	improving	stable
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2009 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.0	+1.0*	+0.1
Percentage-point change in low-achieving students (below Level 2)	+5.5	+3.9	+4.9
Variation in performance	**Reading (2009 to 2018)**	**Mathematics (2009 to 2018)**	**Science (2009 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-6.2*	+6.7*	-6.6*
Average trend amongst the lowest-achieving students (10th percentile)	+5.0*	+1.3	+2.2
Gap in learning outcomes between the highest- and lowest-achieving students	narrowing gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Kazakhstan's mean performance in reading and science in 2018 was close to the level observed in 2009, when the country first participated in PISA. In contrast, in mathematics, mean performance showed significant improvements from the 2009 level. Mathematics performance improved, particularly amongst the highest-performing students; and the share of students who scored at Level 5 or 6 in mathematics increased by 1 percentage point between 2012 and 2018. At the same time, performance in reading and science declined amongst the highest-performing students.

PISA 2015 results for Kazakhstan cannot be compared to results from previous years or to those from 2018 due to the potential of bias introduced by incomplete student-response data. PISA 2018 results fully met the technical standards.

Snapshot of performance trends in KOREA

Mean performance	Reading	Mathematics	Science
PISA 2000	525		
PISA 2003	534*	542*	
PISA 2006	556*	547*	522
PISA 2009	539*	546*	538*
PISA 2012	536*	554*	538*
PISA 2015	517	524	516
PISA 2018	514	526	519
Average 3-year trend in mean performance	-3.1*	-4.1*	-2.9*
Short-term change in mean performance (2015 to 2018)	-3.4	+1.8	+3.2
Overall performance trajectory	increasingly negative	increasingly negative	increasingly negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.2	-9.5*	+1.5
Percentage-point change in low-achieving students (below Level 2)	+9.3*	+5.9*	+2.9
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+2.6	-1.9	+1.0
Average trend amongst the lowest-achieving students (10th percentile)	-9.5*	-7.3*	-7.6*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	widening gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Korea, mean reading, mathematics and science performance in 2018 was close to the level observed in 2015, and below the level observed in 2009 and 2012. In reading and science, this recent decline in performance reversed earlier gains.

Across all three subjects, a significant widening of performance differences could be observed. While no decline was observed amongst the highest-achieving students (the level above which only 10% of students scored remained stable), the lowest-achieving students lost significant ground in all subjects over the period. The 10th percentile of the distribution, representing the level above which 90% of students scored, declined by more than 7 points, on average, per 3-year period, or more than 20 points per decade.

Snapshot of performance trends in **KOSOVO**

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	m	m	m
PISA 2012	m	m	m
PISA 2015	347	362	378*
PISA 2018	353	366	365
Average 3-year trend in mean performance	+5.9	+4.4	-13.6*
Short-term change in mean performance (2015 to 2018)	+5.9	+4.4	-13.6*
Overall performance trajectory	stable	stable	declining
Proficiency levels	**Reading (2015 to 2018)**	**Mathematics (2015 to 2018)**	**Science (2015 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.0	+0.1	-0.0
Percentage-point change in low-achieving students (below Level 2)	+1.9	-1.1	+8.8*
Variation in performance	**Reading (2015 to 2018)**	**Mathematics (2015 to 2018)**	**Science (2015 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-4.6	+5.3	-24.1*
Average trend amongst the lowest-achieving students (10th percentile)	+22.0*	+3.1	-3.5
Gap in learning outcomes between the highest- and lowest-achieving students	narrowing gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Kosovo participated in PISA for the second time in 2018. Mean performance was similar in reading and mathematics, but was 14 points lower in science, than in 2015. In science, the proportion of students scoring below Level 2 increased by 9 percentage points over the period.

Snapshot of performance trends in LATVIA

Mean performance	Reading	Mathematics	Science
PISA 2000	458*		
PISA 2003	491	483*	
PISA 2006	479	486*	490
PISA 2009	484	482*	494
PISA 2012	489*	491	502*
PISA 2015	488*	482*	490
PISA 2018	479	496	487
Average 3-year trend in mean performance	+2.3	+1.7	-0.8
Short-term change in mean performance (2015 to 2018)	-9.1*	+13.8*	-3.0
Overall performance trajectory	hump-shaped (more negative over more recent years)	flat	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+1.9*	+0.5	-0.4
Percentage-point change in low-achieving students (below Level 2)	+4.9*	-2.6	+1.1
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+0.3	+0.1	+0.1
Average trend amongst the lowest-achieving students (10th percentile)	+4.7*	+3.5*	-1.4
Gap in learning outcomes between the highest- and lowest-achieving students	narrowing gap	narrowing gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

When taking into account results from all years, no significant improving or declining trend could be determined, in any subject, in Latvia. In 2018, mean reading performance in Latvia was above the level observed when the country first participated in PISA in 2000, but below the level observed in 2015. Mean mathematics performance was significantly higher in PISA 2018 than in PISA 2015, but when considering the entire 2003-2018 period, mathematics performance appeared to oscillate around a stable mean, with no clear direction of change. Science performance in PISA 2018 was close to that observed in all previous assessments, except in 2012.

A more consistently positive trend was observed amongst the lowest-achieving students in reading and mathematics, narrowing the gap between those and higher-achieving students to some extent.

Snapshot of performance trends in LEBANON

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	m	m	m
PISA 2012	m	m	m
PISA 2015	347	396	386
PISA 2018	353	393	384
Average 3-year trend in mean performance	+6.8	-2.8	-2.8
Short-term change in mean performance (2015 to 2018)	+6.8	-2.8	-2.8
Overall performance trajectory	stable	stable	stable
Proficiency levels	**Reading (2015 to 2018)**	**Mathematics (2015 to 2018)**	**Science (2015 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-0.1	+0.1	+0.1
Percentage-point change in low-achieving students (below Level 2)	-2.6	-0.5	-0.4
Variation in performance	**Reading (2015 to 2018)**	**Mathematics (2015 to 2018)**	**Science (2015 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+4.0	+1.4	+2.6
Average trend amongst the lowest-achieving students (10th percentile)	+8.4	-11.9	-10.6
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

PISA 2018 results for Lebanon, in all three subjects, were close to those observed in 2015, when the country first participated in PISA. This stability of results is remarkable because the proportion of 15-year-olds who were eligible to participate in the PISA assessment increased by about 25% since 2015 (Table I.A2.2).

Snapshot of performance trends in LITHUANIA

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	470	486	488
PISA 2009	468	477	491
PISA 2012	477	479	496*
PISA 2015	472	478	475
PISA 2018	476	481	482
Average 3-year trend in mean performance	+1.6	-0.7	-2.8*
Short-term change in mean performance (2015 to 2018)	+3.5	+2.8	+6.7
Overall performance trajectory	flat	U-shaped (more positive over more recent years)	increasingly negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+2.1*	+0.4	-0.5
Percentage-point change in low-achieving students (below Level 2)	+0.0	-0.4	+1.8
Variation in performance	**Reading (2006 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+2.7	-0.8	-1.5
Average trend amongst the lowest-achieving students (10th percentile)	+1.0	-0.9	-3.7*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Lithuania, mean reading and mathematics performance in 2018 were close to the levels observed in every previous assessments since 2006, when the country first participated in PISA, and no clear direction of change could be determined. Mean science performance in 2018 was significantly above the level observed in 2015, but below the PISA 2012 mean; overall, science results appeared to fluctuate somewhat more than reading or mathematics results, around a declining trend. Despite overall stable results in reading, the proportion of top-performing students increased by 2.1 percentage points between 2009 and 2018.

Snapshot of performance trends in **LUXEMBOURG**

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	479	493*	
PISA 2006	479	490	486*
PISA 2009	472	489	484
PISA 2012	488*	490	491*
PISA 2015	481*	486	483*
PISA 2018	470	483	477
Average 3-year trend in mean performance	-0.7	-1.7	-1.9
Short-term change in mean performance (2015 to 2018)	-11.5*	-2.3	-6.0*
Overall performance trajectory	hump-shaped (more negative over more recent years)	flat	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+1.9*	-0.4	-0.4
Percentage-point change in low-achieving students (below Level 2)	+3.3*	+2.9	+4.7*
Variation in performance	**Reading (2003 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+3.5*	-0.3	-0.6
Average trend amongst the lowest-achieving students (10th percentile)	-2.9*	-3.1*	-1.4
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	widening gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean performance in Luxembourg remained largely stable in mathematics since 2003, although mean performance was 10 score points higher in 2003 than in 2018. Mean performance in reading and science, in contrast, was lower in 2018 than in the most recent previous assessments (2012 and 2015): performance declined by 11 score points in reading and by 6 score points in science between 2015 and 2018.

Between 2009 and 2018, the proportion of 15-year-old students who reported an immigrant background in Luxembourg increased by 15 percentage points, the largest increase amongst OECD countries (Table II.B1.9.9 in *PISA 2018 Results (Volume II): Where All Students Can Succeed*). While immigrant students continued to score more than 30 points below non-immigrant students in reading, performance amongst immigrant students improved significantly between 2009 and 2018 (Table II.B1.9.10). Nevertheless, the change in the proportion of immigrant and non-immigrant students alone could account for about five points (15% of 30 points) of the 18-point decline in mean reading scores over the 2012-2018 period (see also Table I.B1.40).

The gap in performance between the highest- and lowest-achieving students in Luxembourg increased in both reading and mathematics since 2003. Higher shares of immigrant students likely contributed to this widening trend. It can be estimated that, if the student population in 2009 had had the same demographic characteristics as the student population in 2018, no widening of the gap in reading performance would have been observed between 2009 and 2018 (Table I.B1.46).

Snapshot of performance trends in MACAO (CHINA)

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	498*	527*	
PISA 2006	492*	525*	511*
PISA 2009	487*	525*	511*
PISA 2012	509*	538*	521*
PISA 2015	509*	544*	529*
PISA 2018	525	558	544
Average 3-year trend in mean performance	+6.0*	+6.2*	+8.3*
Short-term change in mean performance (2015 to 2018)	+16.4*	+13.9*	+15.0*
Overall performance trajectory	increasingly positive	increasingly positive	increasingly positive
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+10.9*	+3.3	+8.3*
Percentage-point change in low-achieving students (below Level 2)	-4.1*	-5.8*	-4.3*
Variation in performance	**Reading (2003 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+11.2*	+4.5*	+9.7*
Average trend amongst the lowest-achieving students (10th percentile)	-0.1	+7.4*	+6.0*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	narrowing gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Macao (China) showed increasingly positive trends in mean performance in all three subjects over its participation in PISA. Performance in reading and mathematics improved by about 6 score points per 3-year period since 2003; performance in science improved by 8.3 score points per 3-year period since 2006. Improvements were even larger between 2015 and 2018, exceeding 13 score points in all three subjects.

Improvements in reading and science were particularly strong amongst the highest-achieving students. In contrast, in mathematics, improvements were more rapid amongst the lowest-achieving students. The proportion of students performing below Level 2 shrank in all three subjects (reading, mathematics and science), while the proportion of students performing at Level 5 or 6 increased in reading (by about 11 percentage points) and science (by about 8 percentage points). These are amongst the most rapid improvements observed amongst all PISA-participating countries and economies.

Snapshot of performance trends in **MALAYSIA**

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	414	404*	422*
PISA 2012	398*	421*	420*
PISA 2015	m	m	m
PISA 2018	415	440	438
Average 3-year trend in mean performance	+2.2	+12.7*	+6.6*
Short-term change in mean performance (2015 to 2018)	m	m	m
Overall performance trajectory	stable	improving	improving
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2009 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.4	+1.1*	+0.4
Percentage-point change in low-achieving students (below Level 2)	+1.9	-10.3*	-6.4
Variation in performance	**Reading (2009 to 2018)**	**Mathematics (2009 to 2018)**	**Science (2009 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+5.6*	+16.8*	+7.5*
Average trend amongst the lowest-achieving students (10th percentile)	+1.1	+8.7*	+6.5*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	widening gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Malaysia, mean mathematics and science performance in 2018 lay above the performance observed in 2009, when the country first participated in PISA, and in 2012. In reading, performance in 2018 was close to that observed in 2009 but better than that observed in 2012. Improvements were observed, in general, amongst both high- and low-achieving students; but improvements in mathematics were particularly strong amongst the country's highest-achieving students: at the 90th percentile, performance improved by about 17 score points per 3-year period.

PISA 2015 results for Malaysia cannot be compared to results from previous years or to those from 2018 due to the potential of bias introduced by low response rates in the original PISA sample. PISA 2018 results fully met the technical standards.

Snapshot of performance trends in **MALTA**

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	442	463*	461
PISA 2012	m	m	m
PISA 2015	447	479*	465*
PISA 2018	448	472	457
Average 3-year trend in mean performance	+2.3	+3.9*	-1.3
Short-term change in mean performance (2015 to 2018)	+1.6	-6.9*	-8.2*
Overall performance trajectory	stable	improving	stable
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2009 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.9	m	-1.6*
Percentage-point change in low-achieving students (below Level 2)	-0.4	m	+1.0
Variation in performance	**Reading (2009 to 2018)**	**Mathematics (2009 to 2018)**	**Science (2009 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+2.2	+2.4	-4.3*
Average trend amongst the lowest-achieving students (10th percentile)	+5.4	+3.1	+2.6
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Malta, mean performance in reading and science in PISA 2018 was close to that observed in 2010, when the country first participated in PISA. In mathematics, mean performance lay above the performance observed in 2010.

Snapshot of performance trends in MEXICO

Mean performance	Reading	Mathematics	Science
PISA 2000	422		
PISA 2003	400*	385*	
PISA 2006	410	406	410
PISA 2009	425	419*	416
PISA 2012	424	413	415
PISA 2015	423	408	416
PISA 2018	420	409	419
Average 3-year trend in mean performance	+2.0	+3.4*	+1.9
Short-term change in mean performance (2015 to 2018)	-2.8	+0.8	+3.5
Overall performance trajectory	flat	positive, but flattening (less positive over more recent years)	flat
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.4	-0.1	-0.0
Percentage-point change in low-achieving students (below Level 2)	+4.6	+1.5	-4.1
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-0.4	+0.7	-0.2
Average trend amongst the lowest-achieving students (10th percentile)	+4.9*	+6.0*	+4.5*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	narrowing gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean performance in reading, mathematics and science in Mexico remained stable, around a flat trend line, throughout most of the country's participation in PISA. Only PISA 2003 performance (in reading and mathematics) was significantly below its 2018 level; in all other years, and across all subjects, mean performance was not significantly different from PISA 2018. However, this overall stability hides more positive trends amongst the lowest-achieving students. The score reached by at least 90% of students in Mexico (10th percentile) increased, on average, by about 5 score points per 3-year period in each of the three subjects (reading, mathematics and science). As a result of improvements amongst low-achieving students in mathematics and science, the gaps in performance between the highest- and lowest-achieving students in these two subjects shrank over time.

These performance trends were observed over a period of rapid expansion of secondary education. Between 2003 and 2018, Mexico added more than 400 000 students to the total population of 15-year-olds eligible to participate in PISA; the proportion of 15-year-olds who were covered by PISA samples increased from about 50% in 2003 to 66% in 2018. It is likely that this expansion in education opportunities dampened a more positive underlying trend in student performance. Indeed, a simulation that assumes that the highest-scoring 25% of 15-year-olds were eligible to take the test in any given year shows a positive trend amongst this population in mathematics (since 2003) and science (since 2006) (Figure I.9.5).

Snapshot of performance trends in the REPUBLIC OF MOLDOVA

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	388*	397*	413*
PISA 2012	m	m	m
PISA 2015	416	420	428
PISA 2018	424	421	428
Average 3-year trend in mean performance	+13.7*	+9.2*	+6.1*
Short-term change in mean performance (2015 to 2018)	+7.8	+0.9	+0.5
Overall performance trajectory	improving	improving	improving
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2009 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.9*	m	+0.6*
Percentage-point change in low-achieving students (below Level 2)	-14.2*	m	-4.7
Variation in performance	**Reading (2009 to 2018)**	**Mathematics (2009 to 2018)**	**Science (2009 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+17.0*	+13.6*	+8.6*
Average trend amongst the lowest-achieving students (10th percentile)	+11.1*	+5.0*	+5.9*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	widening gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean reading, mathematics and science performance in the Republic of Moldova improved since the country first participated in PISA in 2010. In reading and science, improvements amongst the highest- and lowest-achieving students were similar, and close to the average improvements. In mathematics too, students at all levels improved their performance, but the highest-achieving students improved more than the lowest-achieving students.

Snapshot of performance trends in MONTENEGRO

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	392*	399*	412
PISA 2009	408*	403*	401*
PISA 2012	422	410*	410
PISA 2015	427	418*	411
PISA 2018	421	430	415
Average 3-year trend in mean performance	+7.7*	+7.6*	+1.7
Short-term change in mean performance (2015 to 2018)	-5.8	+11.7*	+3.9
Overall performance trajectory	positive, but flattening (less positive over more recent years)	increasingly positive	U-shaped (more positive over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.2	+0.7*	+0.1
Percentage-point change in low-achieving students (below Level 2)	-5.1	-10.5*	-2.0
Variation in performance	**Reading (2006 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+8.0*	+7.8*	+2.6
Average trend amongst the lowest-achieving students (10th percentile)	+8.2*	+7.8*	+1.0
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Reading and mathematics performance in Montenegro improved since its first participation in PISA in 2006. In reading, most of the improvement occurred in earlier cycles, whereas in mathematics, most of the improvement was observed over the most recent period. In 2018, science performance returned to 2006 levels after an initial slump. Similar trends were observed across the performance distribution: improvements amongst the highest-performing students and amongst the lowest-performing students were close to those observed on average. In mathematics, these improvements resulted in a reduction in the share of low achievers (students scoring below Level 2) of more than 10 percentage points since 2012.

Snapshot of performance trends in the NETHERLANDS

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	513*	538*	
PISA 2006	507*	531*	525*
PISA 2009	508*	526	522*
PISA 2012	511*	523	522*
PISA 2015	503*	512	509
PISA 2018	485	519	503
Average 3-year trend in mean performance	-4.3*	-4.2*	-5.6*
Short-term change in mean performance (2015 to 2018)	-18.2*	+7.0	-5.2
Overall performance trajectory	increasingly negative	steadily negative	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-0.7	-0.8	-2.5
Percentage-point change in low-achieving students (below Level 2)	+9.8*	+1.0	+7.1*
Variation in performance	**Reading (2003 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+0.6	-4.1*	-2.9*
Average trend amongst the lowest-achieving students (10th percentile)	-9.0*	-5.2*	-8.5*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In the Netherlands, mean performance in reading in 2018 was below the level observed in any previous assessment, while mean performance in mathematics and science remained closer to the level observed in 2015. However, when considering all comparable assessments, the long-term trajectory was clearly negative in mathematics and science too. In reading, no decline was observed amongst the highest-performing students, but rapid declines were observed amongst the lowest-achieving students; in science, performance declined amongst the highest-achieving students too, but more so amongst the lowest-achieving students. In mathematics, trends were similar across high- and low-achieving students. The proportion of students scoring at Level 5 or 6 in PISA remained stable in all three subjects, compared to the last assessment in which each subject was the major focus. However, the proportion of students scoring below Level 2 grew by almost 10 percentage points in reading (compared to 2009) and by 7 percentage points in science (compared to 2006).

Snapshot of performance trends in NEW ZEALAND

Mean performance	Reading	Mathematics	Science
PISA 2000	529*		
PISA 2003	522	523*	
PISA 2006	521*	522*	530*
PISA 2009	521*	519*	532*
PISA 2012	512	500	516
PISA 2015	509	495	513
PISA 2018	506	494	508
Average 3-year trend in mean performance	-3.7*	-7.0*	-6.2*
Short-term change in mean performance (2015 to 2018)	-3.5	-0.7	-4.8
Overall performance trajectory	steadily negative	steadily negative	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-2.6	-3.4*	-6.3*
Percentage-point change in low-achieving students (below Level 2)	+4.6*	-0.9	+4.3*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-3.3*	-7.9*	-7.1*
Average trend amongst the lowest-achieving students (10th percentile)	-3.2*	-6.0*	-5.1*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	narrowing gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean performance in New Zealand has been steadily declining in reading (2000-2018), mathematics (2003-2018) and science (2006-2018) from initially high levels of performance; it has been declining in science too, at least since 2012. In reading, more rapid declines were observed amongst the country's lowest-achieving students; in mathematics and science, performance declined to a similar extent at the top and the bottom of the performance distribution, as well as on average.

The proportion of top-performing students (scoring at Level 5 or 6) remained stable in reading (between 2009 and 2018), but decreased in mathematics (between 2012 and 2018) and in science (between 2006 and 2018). Meanwhile, the proportion of low-achieving students (scoring below Level 2) increased in reading and science.

Snapshot of performance trends in the REPUBLIC OF NORTH MACEDONIA

Mean performance	Reading	Mathematics	Science
PISA 2000	373*		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	m	m	m
PISA 2012	m	m	m
PISA 2015	352*	371*	384*
PISA 2018	393	394	413
Average 3-year trend in mean performance	+1.1	+23.3*	+28.7*
Short-term change in mean performance (2015 to 2018)	+40.9*	+23.1*	+29.4*
Overall performance trajectory	stable	improving	improving
Proficiency levels	**Reading (2015 to 2018)**	**Mathematics (2015 to 2018)**	**Science (2015 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-0.7	-0.8	-2.5
Percentage-point change in low-achieving students (below Level 2)	+9.8*	+1.0	+7.1*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2015 to 2018)**	**Science (2015 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+0.6	-4.1*	-2.9*
Average trend amongst the lowest-achieving students (10th percentile)	-9.0*	-5.2*	-8.5*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Students in the Republic of North Macedonia (hereafter, North Macedonia) improved significantly in all three subjects since 2015. While performance is still significantly below the OECD average in reading, mathematics and science, the percentage of low performers in each subject shrank by at least 9 percentage points. Improvements were observed throughout the performance distribution, as the lowest- and highest-achieving students improved their proficiency between 2015 and 2018. The highest- and lowest-performing students in mathematics saw similar improvements in performance, while the highest-performing students in science improved significantly more than the lowest-performing students.

North Macedonia also participated in the reading assessment in PISA 2000; if these results were taken into account, mean reading performance in North Macedonia would be classified as stable.

Snapshot of performance trends in NORWAY

Mean performance	Reading	Mathematics	Science
PISA 2000	505		
PISA 2003	500	495	
PISA 2006	484*	490*	487
PISA 2009	503	498	500
PISA 2012	504	489*	495
PISA 2015	513*	502	498*
PISA 2018	499	501	490
Average 3-year trend in mean performance	+1.0	+1.5	+0.6
Short-term change in mean performance (2015 to 2018)	-13.7*	-0.8	-8.1*
Overall performance trajectory	flat	flat	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+2.9*	+2.8*	+0.7
Percentage-point change in low-achieving students (below Level 2)	+4.3*	-3.4*	-0.2
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+1.3	+0.5	+1.9
Average trend amongst the lowest-achieving students (10th percentile)	+1.4	+1.8	-2.7
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In 2018, Norway's performance in PISA lay below PISA 2015 performance in reading and science. However, when trends were assessed over a longer period, no clear direction of change (neither positive, nor negative) could be determined in any subject. PISA 2018 results were close to the average performance across PISA assessments for the country. Trends over this longer period were similar at the top and at the bottom of the performance distribution.

At least over the more recent period (2009-2018), performance trends in Norway were influenced by the concurrent increase in the proportion of immigrant students who tended to score below non-immigrant students. It could be estimated that, if the student population in 2009 had had the same demographic profile as the population in 2018, the average score in reading would have been 497 points (Table I.B1.40). In reality, the average score observed in 2009 was 503 points (Table I.B1.10). The (non-significant) decline in mean performance between 2009 and 2018 could therefore be entirely explained by the changing demographic composition of the student population.

Snapshot of performance trends in **PANAMA**

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	371	360	376
PISA 2012	m	m	m
PISA 2015	m	m	m
PISA 2018	377	353	365
Average 3-year trend in mean performance	+2.1	-2.3	-3.8
Short-term change in mean performance (2015 to 2018)	m	m	m
Overall performance trajectory	stable	stable	stable
Proficiency levels	Reading (2009 to 2018)	Mathematics (2012 to 2018)	Science (2009 to 2018)
Percentage-point change in top-performing students (Level 5 or 6)	-0.3	m	-0.1
Percentage-point change in low-achieving students (below Level 2)	-0.9	m	+6.2
Variation in performance	Reading (2000 to 2018)	Mathematics (2009 to 2018)	Science (2009 to 2018)
Average trend amongst the highest-achieving students (90th percentile)	-2.8	-4.0	-5.5
Average trend amongst the lowest-achieving students (10th percentile)	+6.3	-2.1	-0.4
Gap in learning outcomes between the highest- and lowest-achieving students	narrowing gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Panama participated in PISA for the second time in 2018, after first participating in 2009. PISA 2018 results reflected broadly similar performance in all three subjects (reading, mathematics and science) as was observed in 2009.

Snapshot of performance trends in PERU

Mean performance	Reading	Mathematics	Science
PISA 2000	327*		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	370*	365*	369*
PISA 2012	384*	368*	373*
PISA 2015	398	387*	397
PISA 2018	401	400	404
Average 3-year trend in mean performance	+13.5*	+12.2*	+12.8*
Short-term change in mean performance (2015 to 2018)	+3.0	+13.3*	+7.5
Overall performance trajectory	positive, but flattening (less positive over more recent years)	improving	improving

Proficiency levels	Reading (2009 to 2018)	Mathematics (2012 to 2018)	Science (2009 to 2018)
Percentage-point change in top-performing students (Level 5 or 6)	+0.3	+0.3	+0.0
Percentage-point change in low-achieving students (below Level 2)	-10.5*	-14.2*	-13.8*

Variation in performance	Reading (2000 to 2018)	Mathematics (2009 to 2018)	Science (2009 to 2018)
Average trend amongst the highest-achieving students (90th percentile)	+12.5*	+10.8*	+10.3*
Average trend amongst the lowest-achieving students (10th percentile)	+14.6*	+14.5*	+17.3*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Over the 2009-2018 period, mean performance in Peru improved from initially low levels in all three subjects (reading, mathematics and science). The improvement in reading performance is even more pronounced when considering PISA 2000 results. Improvements were observed amongst the country's highest-achieving and lowest-achieving students. In mathematics, a significant improvement was also observed over the most recent period (2015-2018).

Snapshot of performance trends in POLAND

Mean performance	Reading	Mathematics	Science
PISA 2000	479*		
PISA 2003	497	490*	
PISA 2006	508	495*	498*
PISA 2009	500*	495*	508
PISA 2012	518	518	526*
PISA 2015	506	504*	501*
PISA 2018	512	516	511
Average 3-year trend in mean performance	+4.5*	+5.1*	+2.1
Short-term change in mean performance (2015 to 2018)	+6.2	+11.2*	+9.6*
Overall performance trajectory	positive, but flattening (less positive over more recent years)	steadily positive	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+5.0*	-1.0	+2.5*
Percentage-point change in low-achieving students (below Level 2)	-0.4	+0.3	-3.1*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+3.3*	+4.7*	+3.0
Average trend amongst the lowest-achieving students (10th percentile)	+6.4*	+4.4*	+1.0
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Poland, PISA 2018 performance was about 10 points higher than in 2015 in mathematics and science, and close to the level observed in 2012 in reading and mathematics. Over the longer period, the direction of change in mean performance was clearly positive in reading (2000-2018) and mathematics (2003-2018). In science, no clear direction of change could be determined, because PISA 2018 results were higher than results observed in 2006 and 2015 (when science was the focus of the assessment), but remained below those observed in 2012.

Between 2009 and 2018, the proportion of top-performing students in reading (students scoring at Level 5 or 6) increased by 5 percentage points.

Snapshot of performance trends in PORTUGAL

Mean performance	Reading	Mathematics	Science
PISA 2000	470*		
PISA 2003	478	466*	
PISA 2006	472*	466*	474*
PISA 2009	489	487	493
PISA 2012	488	487	489
PISA 2015	498	492	501*
PISA 2018	492	492	492
Average 3-year trend in mean performance	+4.3*	+6.0*	+4.3*
Short-term change in mean performance (2015 to 2018)	-6.3	+0.9	-9.4*
Overall performance trajectory	steadily positive	positive, but flattening (less positive over more recent years)	positive, but flattening (less positive over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+2.5*	+1.0	+2.5*
Percentage-point change in low-achieving students (below Level 2)	+2.6	-1.6	-4.9*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+4.1*	+7.8*	+6.0*
Average trend amongst the lowest-achieving students (10th percentile)	+5.2*	+2.6	+1.7
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	widening gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Portugal, mean performance in reading, mathematics and science improved since 2000, 2003 and 2006. In reading and mathematics, mean performance in 2018 was close to the level observed over the period 2009-2015; in science, mean performance in 2018 was below that of 2015, and returned close to the level observed in 2009 and 2012.

Snapshot of performance trends in QATAR

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	312*	318*	349*
PISA 2009	372*	368*	379*
PISA 2012	388*	376*	384*
PISA 2015	402	402*	418
PISA 2018	407	414	419
Average 3-year trend in mean performance	+21.9*	+22.6*	+17.9*
Short-term change in mean performance (2015 to 2018)	+5.2	+11.8*	+1.5
Overall performance trajectory	positive, but flattening (less positive over more recent years)	positive, but flattening (less positive over more recent years)	positive, but flattening (less positive over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.9*	+0.9*	+1.9*
Percentage-point change in low-achieving students (below Level 2)	-12.6*	-15.9*	-30.7*
Variation in performance	**Reading (2006 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+20.9*	+23.9*	+22.2*
Average trend amongst the lowest-achieving students (10th percentile)	+19.3*	+18.1*	+11.3*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	widening gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Performance in reading, mathematics and science in Qatar improved at one of the most rapid rates, and from initially low levels, throughout the country's participation in PISA. As a result, in all subjects, the share of low-achieving students (those who scored below Level 2) shrank and the share of top-performing students (those who scored at Level 5 or 6) increased.

Over the most recent period (2009-2018), about one-third of the improvement in reading performance (i.e. 13 of 35 score points) could be attributed to changes in the composition of the student population in Qatar, with significant increases in the share of foreign-born students, who tended to score higher than non-immigrant students (Table I.B1.40).

Snapshot of performance trends in ROMANIA

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	396*	415*	418
PISA 2009	424	427	428
PISA 2012	438	445*	439
PISA 2015	434	444*	435
PISA 2018	428	430	426
Average 3-year trend in mean performance	+7.2*	+4.7*	+2.1
Short-term change in mean performance (2015 to 2018)	-5.9	-14.0*	-9.1
Overall performance trajectory	positive, but flattening (less positive over more recent years)	positive, but flattening (less positive over more recent years)	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading** (2009 to 2018)	**Mathematics** (2012 to 2018)	**Science** (2006 to 2018)
Percentage-point change in top-performing students (Level 5 or 6)	+0.7*	-0.0	+0.5
Percentage-point change in low-achieving students (below Level 2)	+0.4	+5.7	-3.0
Variation in performance	**Reading** (2006 to 2018)	**Mathematics** (2006 to 2018)	**Science** (2006 to 2018)
Average trend amongst the highest-achieving students (90th percentile)	+10.1*	+8.8*	+4.5*
Average trend amongst the lowest-achieving students (10th percentile)	+5.4*	+1.2	+0.1
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	widening gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean reading performance in Romania was higher than in 2006, when the country first participated in PISA, but not statistically significantly different from any result since then. Mean mathematics performance in 2018 was significantly lower than in 2015, reversing some of the gains observed between 2006 and 2015 whereas science performance returned, in 2018, close to the level observed in 2006 or 2009.

In mathematics and science, students at different levels in the performance distribution followed distinct trends, and gaps in performance widened.

Snapshot of performance trends in the **RUSSIAN FEDERATION**

Mean performance	Reading	Mathematics	Science
PISA 2000	462*		
PISA 2003	442*	468*	
PISA 2006	440*	476*	479
PISA 2009	459*	468*	478
PISA 2012	475	482	486
PISA 2015	495*	494	487*
PISA 2018	479	488	478
Average 3-year trend in mean performance	+6.8*	+4.7*	+0.5
Short-term change in mean performance (2015 to 2018)	-16.1*	-6.3	-8.9*
Overall performance trajectory	increasingly positive	steadily positive	flat
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+2.3*	+0.3	-1.1
Percentage-point change in low-achieving students (below Level 2)	-5.3*	-2.3	-1.0
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+6.7*	+2.8	-1.9
Average trend amongst the lowest-achieving students (10th percentile)	+7.7*	+5.8*	+2.5
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	narrowing gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In the Russian Federation, performance in PISA 2018 was close to the level observed in 2012 in all three subjects, although it lay below PISA 2015 performance in reading and mathematics. Over a longer period of time, and when taking into account results from all years, the overall direction of mean performance trends was positive in reading (over the 2000-2018 period) and in mathematics (over the 2003-2018 period), while no overall direction of change can be determined in science.

In science, a more positive trend was observed amongst the country's lowest-achieving students than amongst the country's highest-achieving students. In mathematics, performance improved both at the top and at the bottom of the distribution, but more so amongst the lowest-achieving students (at the bottom). As a result, performance gaps in these two subjects narrowed.

Snapshot of performance trends in **SERBIA**

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	401*	435*	436
PISA 2009	442	442	443
PISA 2012	446	449	445
PISA 2015	m	m	m
PISA 2018	439	448	440
Average 3-year trend in mean performance	+7.7*	+3.0*	+0.7
Short-term change in mean performance (2015 to 2018)	m	m	m
Overall performance trajectory	improving	improving	stable
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+1.7*	+0.7	+0.8*
Percentage-point change in low-achieving students (below Level 2)	+4.9	+0.8	-0.2
Variation in performance	**Reading (2006 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+11.3*	+5.6*	+4.4*
Average trend amongst the lowest-achieving students (10th percentile)	+4.8*	+1.2	-1.8
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	widening gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Serbia, mean performance in reading and mathematics improved since the country first participated in PISA in 2006; performance in science remained stable, on average. Across all three subjects, improvements were more marked amongst the highest-achieving students, and a widening of performance gaps was observed. The percentage of students scoring at the highest levels of proficiency increased, particularly in reading (+1.7 percentage points since 2009) and in science (+0.8 of a percentage point since 2006).

Snapshot of performance trends in SINGAPORE

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	526*	562	542*
PISA 2012	542	573	551
PISA 2015	535*	564	556
PISA 2018	549	569	551
Average 3-year trend in mean performance	+6.4*	+1.1	+3.2*
Short-term change in mean performance (2015 to 2018)	+14.4*	+4.8	-4.6
Overall performance trajectory	improving	stable	improving
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2009 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+10.1*	-3.1	+0.8
Percentage-point change in low-achieving students (below Level 2)	-1.2	-1.1	-2.5*
Variation in performance	**Reading (2009 to 2018)**	**Mathematics (2009 to 2018)**	**Science (2009 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+9.5*	-5.1*	-0.9
Average trend amongst the lowest-achieving students (10th percentile)	+0.3	+5.9*	+4.4*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	narrowing gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean performance in Singapore improved significantly in reading, both over the longer period (2009-2018) and between 2015 and 2018. Mean mathematics performance in 2018 stood close to the average level observed over previous assessments (2009-2015), while mean performance in science improved between 2009 and 2018.

Performance in reading improved, particularly amongst the country's highest-achieving students. Between 2009 and 2018 the proportion of 15-year-old students scoring at Level 5 or 6 on the PISA scale increased by 10 percentage points; meanwhile, the proportion of low-achieving students in reading remained stable. In science, by contrast, improvements in mean performance were driven by improvements amongst the lowest-achieving students: the proportion of low-achievers in science (those scoring below Level 2) shrank by 2.5 percentage points.

Snapshot of performance trends in the SLOVAK REPUBLIC

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	469	498*	
PISA 2006	466	492	488*
PISA 2009	477*	497*	490*
PISA 2012	463	482	471
PISA 2015	453	475*	461
PISA 2018	458	486	464
Average 3-year trend in mean performance	-3.2*	-3.6*	-7.8*
Short-term change in mean performance (2015 to 2018)	+5.5	+10.9*	+3.3
Overall performance trajectory	steadily negative	steadily negative	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+0.2	-0.2	-2.1*
Percentage-point change in low-achieving students (below Level 2)	+9.2*	-2.4	+9.1*
Variation in performance	**Reading (2003 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-0.8	-2.8*	-6.2*
Average trend amongst the lowest-achieving students (10th percentile)	-5.4*	-6.1*	-10.0*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean performance in science and, to a lesser extent, in reading and mathematics, has declined steadily since the Slovak Republic's first participation in PISA. In science, mean performance in 2018 was roughly 25 score points below what it was in 2006 and 2009. In mathematics, performance in 2015 was particularly poor, but PISA 2018 results marked a return to a level similar to that observed in 2012. In reading, the decline was the mildest. Amongst the lowest-achieving students, performance declined, on average, by 5.4 score points every 3 years, whereas amongst the highest-performing students, performance remained stable. In reading, the proportion of low-achieving students (students scoring below Level 2) grew by about 9 percentage points between 2009 and 2018; a similarly large increase was observed in science between 2009 and 2018.

Snapshot of performance trends in SLOVENIA

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	494	504	519*
PISA 2009	483*	501	512
PISA 2012	481*	501*	514
PISA 2015	505*	510	513*
PISA 2018	495	509	507
Average 3-year trend in mean performance	+2.4	+1.8	-2.2*
Short-term change in mean performance (2015 to 2018)	-9.9*	-1.0	-5.9*
Overall performance trajectory	U-shaped (more positive over more recent years)	U-shaped (more positive over more recent years)	steadily negative
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+3.2*	-0.1	-5.6*
Percentage-point change in low-achieving students (below Level 2)	-3.3*	-3.7*	+0.7
Variation in performance	**Reading (2006 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+4.3*	-0.8	-5.0*
Average trend amongst the lowest-achieving students (10th percentile)	+1.3	+2.0	-0.2
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Slovenia, PISA 2018 results in reading and mathematics lay close to their historic average. Some significant differences were observed when comparing PISA 2018 results to those of earlier years. In particular, PISA 2018 reading performance was lower, on average, than in 2015, but higher than in 2009 or 2012; and PISA 2018 mathematics performance was higher than in 2012. However, over the full 2006-2018 period, and when taking into account results from all years, no significant improving or declining trend could be determined. In science, a mild negative trend was observed, and performance was lower, on average, than in 2015 and in 2006.

Between 2009 and 2018, improvements in reading performance appeared to be particularly strong amongst the highest-achieving students; and the proportion of students scoring at Level 5 or 6 in PISA (top-performing students) increased by 3.2 percentage points. In science, by contrast, between 2006 and 2018, performance amongst the highest-achieving students appeared to decline faster than amongst the lowest-achieving students. The proportion of top-performing students in science shrank by 5.6 percentage points over this period.

Snapshot of performance trends in SPAIN

Mean performance	Reading	Mathematics	Science
PISA 2000	493*		
PISA 2003	481	485	
PISA 2006	461*	480	488
PISA 2009	481	483	488
PISA 2012	488*	484	496*
PISA 2015	496*	486	493*
PISA 2018	m	481	483
Average 3-year trend in mean performance	+1.6	+0.0	-0.5
Short-term change in mean performance (2015 to 2018)	m	-4.5	-9.5*
Overall performance trajectory	U-shaped (more positive over more recent years)	flat	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	m	-0.7	-0.7
Percentage-point change in low-achieving students (below Level 2)	m	+1.1	+1.6
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	m	-0.6	-0.2
Average trend amongst the lowest-achieving students (10th percentile)	m	+0.4	-0.9
Gap in learning outcomes between the highest- and lowest-achieving students	m	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Spain's data met PISA 2018 Technical Standards. However, some data show implausible student-response behaviour. Consequently, at the time of publication of this report, comparability of Spain's results in reading cannot be assured (see Annex A9). PISA 2018 reading results for Spain are therefore not published in this report

Mean mathematics performance remained stable, around a flat trend line, throughout the country's participation in PISA (including PISA 2018). Mean performance in science declined between 2015 and 2018 by 9.5 score points. Despite the recent decline in science performance, over a longer period, and when taking into account results from all years, no significant improving or declining trend could be determined, in any subject.

Snapshot of performance trends in SWEDEN

Mean performance	Reading	Mathematics	Science
PISA 2000	516		
PISA 2003	514	509	
PISA 2006	507	502	503
PISA 2009	497	494	495
PISA 2012	483*	478*	485*
PISA 2015	500	494	493
PISA 2018	506	502	499
Average 3-year trend in mean performance	-3.0*	-2.1	-1.0
Short-term change in mean performance (2015 to 2018)	+5.6	+8.5	+6.0
Overall performance trajectory	negative, but flattening (less negative over more recent years)	U-shaped (more positive over more recent years)	U-shaped (more positive over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+4.2*	+4.6*	+0.4
Percentage-point change in low-achieving students (below Level 2)	+1.0	-8.3*	+2.6
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+0.1	-2.9*	+0.5
Average trend amongst the lowest-achieving students (10th percentile)	-6.4*	-2.0	-3.8*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

After a rapid decline until 2012, mean reading, mathematics and science performance in Sweden recovered fully or almost fully between 2012 and 2018, returning to a level similar to that observed in the early PISA assessments. In mathematics, for example, mean performance in 2018 lay more than 20 points above the PISA 2012 mean score. Between 2012 and 2018, the proportion of low-achieving students (scoring below Level 2) shrank by 8 percentage points and, at the same time, the proportion of top-performing students (scoring at Level 5 or 6) grew by about 5 percentage points. In reading and science, however, performance gaps widened over the long term. While no overall change could be determined amongst the highest-achieving students, performance amongst the lowest-achieving students tended to decline, particularly in reading.

Sweden's improvement in mean performance since PISA 2012 was observed over a period of rapid increase in the proportion of immigrant students, who tended to score below non-immigrant students. It could be estimated that, if the student population in 2009 had had the same demographic profile as the population in 2018, the average score in reading would have been nine points lower than what was observed that year (Tables I.B1.10 and I.B1.40) – and the recent trends would have been even more positive. The widening gap in reading performance between the highest- and lowest-achieving students also seemed to be at least partly related to growing shares of immigrant students (Tables I.B1.10 and I.B1.40).

The massive inflow of immigrants in the most recent period, however, also led to an increase in student exclusion rates. In 2018, about 11% of 15-year-old students were excluded from the PISA test – the highest rate amongst all participating countries/economies (Table I.A2.1). While limited information is available about excluded students, this increase is most likely the consequence of the large (and temporary) increase, between 2015 and 2018, of recently arrived immigrants in the school system.

Snapshot of performance trends in SWITZERLAND

Mean performance	Reading	Mathematics	Science
PISA 2000	494		
PISA 2003	499	527*	
PISA 2006	499*	530*	512*
PISA 2009	501*	534*	517*
PISA 2012	509*	531*	515*
PISA 2015	492	521	506*
PISA 2018	484	515	495
Average 3-year trend in mean performance	-1.3	-2.5*	-4.4*
Short-term change in mean performance (2015 to 2018)	-8.3	-5.9	-10.2*
Overall performance trajectory	hump-shaped (more negative over more recent years)	increasingly negative	increasingly negative

Proficiency levels	Reading (2009 to 2018)	Mathematics (2012 to 2018)	Science (2006 to 2018)
Percentage-point change in top-performing students (Level 5 or 6)	-0.0	-4.4*	-2.7*
Percentage-point change in low-achieving students (below Level 2)	+6.8*	+4.4*	+4.2*

Variation in performance	Reading (2000 to 2018)	Mathematics (2003 to 2018)	Science (2006 to 2018)
Average trend amongst the highest-achieving students (90th percentile)	-0.5	-3.4*	-3.3
Average trend amongst the lowest-achieving students (10th percentile)	-1.7	-1.1	-3.9*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In 2018, mean performance in reading, mathematics and science in Switzerland was significantly below mean performance in PISA 2006, 2009 or 2012. The decline in performance was particularly marked since 2012. Overall trends followed similar trajectories at the top and bottom of the performance distribution. In mathematics, for example, the proportion of top-performing students (scoring at Level 5 or 6) shrank by 4.4 percentage points between 2012 and 2018, and the proportion of low-achieving students (scoring below Level 2) increased by a similar amount.

Between 2009 and 2018, the proportion of 15-year-old students with an immigrant background in Switzerland increased by 10 percentage points, one of the largest increases amongst OECD countries (Table II.B1.9.9 in *PISA 2018 Results (Volume II): Where All Students Can Succeed*). Because in Switzerland, in 2009 as well as in 2018, immigrant students scored about 50 points below non-immigrant students in reading (Table II.B1.9.10), the change in the proportion of immigrant and non-immigrant students alone could account for about five points (i.e. 10% of 50 points), or roughly one-third of the 17-point difference in mean reading scores between PISA 2009 and PISA 2018 (see also Tables I.B1.40-I.B1.42 for mean performance trends that account for demographic changes in the student population).

Snapshot of performance trends in CHINESE TAIPEI

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	496	549*	532*
PISA 2009	495	543*	520
PISA 2012	523*	560*	523
PISA 2015	497	542*	532*
PISA 2018	503	531	516
Average 3-year trend in mean performance	+1.5	-3.8*	-2.2
Short-term change in mean performance (2015 to 2018)	+5.5	-11.2*	-16.6*
Overall performance trajectory	hump-shaped (more negative over more recent years)	increasingly negative	flat
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+5.7*	-14.0*	-3.0*
Percentage-point change in low-achieving students (below Level 2)	+2.2	+1.1	+3.5*
Variation in performance	**Reading (2006 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+7.4*	-5.2*	+0.5
Average trend amongst the lowest-achieving students (10th percentile)	-3.7	-2.4	-4.6*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	stable gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Performance in Chinese Taipei has fluctuated since its first participation in PISA in 2006. The trajectory of mean performance in science could be classified as flat overall, although that masks relative highs in performance in 2006 and 2012 and relative lows in 2009, 2015 and 2018.

The trajectory of mean performance in reading can be described as hump-shaped, primarily due to Chinese Taipei's high performance in 2012. Performance in all other years was statistically similar to that observed in 2018. The gap in performance between the highest- and lowest-achieving students widened, primarily due to the highest-achieving students performing better over time (by 7.4 score points every 3 years). Between 2008 and 2018, the proportion of students who scored at Level 5 or 6 in reading grew by about 6 percentage points, but the proportion of low achievers (scoring below Level 2) did not decrease.

The trajectory was more negative in mathematics, where PISA 2018 results were significantly lower than in any previous year, and particularly compared to 2012 results (a decline of 29 score points), the last time mathematics was the focus of the assessment. The highest-achieving students performed worse in mathematics over time, declining 5.2 score points every 3 years on average over the 2006 to 2018 period; and the proportion of top-performing students (scoring at Level 5 or 6) shrank by 14 percentage points between 2012 and 2018. Nevertheless, mean performance in mathematics remained well above the OECD average.

Snapshot of performance trends in THAILAND

Mean performance	Reading	Mathematics	Science
PISA 2000	431*		
PISA 2003	420*	417	
PISA 2006	417*	417	421
PISA 2009	421*	419	425
PISA 2012	441*	427	444*
PISA 2015	409*	415	421
PISA 2018	393	419	426
Average 3-year trend in mean performance	-4.1*	+0.3	+0.6
Short-term change in mean performance (2015 to 2018)	-16.2*	+3.1	+4.5
Overall performance trajectory	increasingly negative	flat	hump-shaped (more negative over more recent years)
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-0.1	-0.3	+0.3
Percentage-point change in low-achieving students (below Level 2)	+16.7*	+3.0	-1.6
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-2.6	+1.4	+2.3
Average trend amongst the lowest-achieving students (10th percentile)	-4.1*	-1.1	-0.5
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	widening gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Thailand's mean reading performance in PISA 2018 was lower than in any previous assessment, and 16 points lower than in PISA 2015. In mathematics, by contrast, mean performance remained stable, around a flat trend line, over the entire period (2003-2018). Performance in science also appeared stable; only PISA 2012 results differ significantly from PISA 2018 results.

The negative trend in reading resulted in an increase of 16.7 percentage points, between 2009 and 2018, in the proportion of students scoring below Level 2 (low achievers).

Snapshot of performance trends in TURKEY

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	441*	423*	
PISA 2006	447*	424*	424*
PISA 2009	464	445	454*
PISA 2012	475	448	463
PISA 2015	428*	420*	425*
PISA 2018	466	454	468
Average 3-year trend in mean performance	+2.2	+4.1*	+6.1*
Short-term change in mean performance (2015 to 2018)	+37.3*	+33.1*	+42.8*
Overall performance trajectory	hump-shaped (more negative over more recent years)	steadily positive	steadily positive
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+1.5*	-1.1	+1.5*
Percentage-point change in low-achieving students (below Level 2)	+1.6	-5.3	-21.4*
Variation in performance	**Reading (2003 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+0.7	-0.2	+5.1*
Average trend amongst the lowest-achieving students (10th percentile)	+3.4*	+6.3*	+4.8*
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	narrowing gap	stable gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Turkey's mean performance in PISA 2018, in all three subjects, was not significantly different from that observed in 2009 or 2012 and was significantly higher than the level observed in 2003 and 2006. When considering results from all years, it is clear that PISA 2015 results – which were considerably lower – were anomalous, and neither the decline between 2012 and 2015, nor the recovery between 2015 and 2018, reflect the long-term trajectory. Overall, this trajectory is clearly positive in mathematics (over the 2003-2018 period) and in science (2006-2018). In mathematics, improvements were more pronounced at the bottom of the performance distribution, amongst the lowest-achieving students, who caught up to the higher-performing students.

These performance trends were observed over a period of rapid expansion of secondary education. Between 2003 and 2018, Turkey added more than 400 000 students to the total population of 15-year-olds eligible to participate in PISA; the proportion of 15-year-olds who were covered by PISA samples more than doubled, from about 36% in 2003 to 73% in 2018 (Table I.A2.1). It is likely that this expansion in education opportunities dampened a more positive underlying trend in student performance. Indeed, a simulation that assumes that the top-scoring 25% of 15-year-olds were eligible to take the test in any given year shows a positive trend amongst this population in mathematics (since 2003) and science (since 2006) (Figure I.9.5).

Snapshot of performance trends in the UNITED ARAB EMIRATES

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	m	m	m
PISA 2009	431	421*	438
PISA 2012	442*	434	448*
PISA 2015	434	427	437
PISA 2018	432	435	434
Average 3-year trend in mean performance	-0.7	+3.7	-2.5
Short-term change in mean performance (2015 to 2018)	-1.8	+7.5	-3.1
Overall performance trajectory	stable	stable	stable
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2009 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+2.5*	+2.0*	+0.7*
Percentage-point change in low-achieving students (below Level 2)	+3.1	-0.8	+3.6
Variation in performance	**Reading (2009 to 2018)**	**Mathematics (2009 to 2018)**	**Science (2009 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+8.9*	+10.0*	+3.0
Average trend amongst the lowest-achieving students (10th percentile)	-8.1*	-3.7	-6.5*
Gap in learning outcomes between the highest- and lowest-achieving students	widening gap	widening gap	widening gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Since the United Arab Emirates first participated in PISA in 2009, mean performance across all three subjects remained largely stable. Mean performance in mathematics fluctuated, but only over a range of less than 15 score points. This apparent stability masks changes in the performance distribution, however. In all three subjects, the highest-achieving students either improved their performance (by up to 10 score points every 3 years in mathematics) or saw no significant change in their performance. The lowest-achieving students either saw a decline in their performance (by up to 8.1 score points every 3 years in reading) or saw no significant change. Since 2009, the gap between the highest- and lowest-achieving students widened in all three subjects.

Snapshot of performance trends in the UNITED KINGDOM

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	m	m	
PISA 2006	495	495	515*
PISA 2009	494*	492	514
PISA 2012	499	494	514
PISA 2015	498	492*	509
PISA 2018	504	502	505
Average 3-year trend in mean performance	+2.1	+1.3	-2.4
Short-term change in mean performance (2015 to 2018)	+6.0	+9.3*	-4.6
Overall performance trajectory	flat	U-shaped (more positive over more recent years)	flat
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+3.4*	+1.0	-4.1*
Percentage-point change in low-achieving students (below Level 2)	-1.1	-2.6	+0.7
Variation in performance	**Reading (2006 to 2018)**	**Mathematics (2006 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+2.9	+1.9	-4.2*
Average trend amongst the lowest-achieving students (10th percentile)	+2.9	-0.8	-1.0
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean performance in reading and science in the United Kingdom remained stable since 2006, with no significant improvement or decline. This apparently stability hides changes in the performance of high- and low-scoring students. There was a 3.4 percentage-point increase in the share of top performers in reading between 2009 and 2018 but a 4.1 percentage-point decrease in the percentage of top performers in science between 2006 and 2018. Mean performance in mathematics was mostly flat but with a significant 9 score-point improvement between 2015 and 2018. In 2018, for the first time, the United Kingdom performed statistically significantly above the OECD average in mathematics.

Snapshot of performance trends in the UNITED STATES

Mean performance	Reading	Mathematics	Science
PISA 2000	504		
PISA 2003	495	483	
PISA 2006	m	474	489*
PISA 2009	500	487	502
PISA 2012	498	481	497
PISA 2015	497	470	496
PISA 2018	505	478	502
Average 3-year trend in mean performance	+0.2	-1.2	+2.1
Short-term change in mean performance (2015 to 2018)	+8.4	+8.6	+6.1
Overall performance trajectory	flat	flat	flat
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	+3.7*	-0.5	+0.0
Percentage-point change in low-achieving students (below Level 2)	+1.6	+1.3	-5.7*
Variation in performance	**Reading (2000 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	+0.4	-2.3	-0.2
Average trend amongst the lowest-achieving students (10th percentile)	+0.2	-0.1	+3.6
Gap in learning outcomes between the highest- and lowest-achieving students	stable gap	stable gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.
Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

Mean performance in reading, mathematics and science in the United States remained about the same in every PISA assessment, with no significant improvement or decline. Only science performance in 2006 was significantly below the 2018 mean score, but even in science, performance has followed a flat trajectory since 2009.

Nevertheless, in reading, the share of 15-year-old students scoring at Level 5 or 6 (top performers) increased by almost 4 percentage points between 2009 and 2018, to 13.5%. In science, some improvements were observed amongst the lowest-achieving students, and the gap between the lowest- and the highest-achieving students narrowed. The share of 15-year-old students scoring below Level 2 proficiency in science shrank by 5.7 percentage points between 2006 and 2018.

Snapshot of performance trends in URUGUAY

Mean performance	Reading	Mathematics	Science
PISA 2000	m		
PISA 2003	434	422	
PISA 2006	413*	427	428
PISA 2009	426	427	427
PISA 2012	411*	409	416
PISA 2015	437	418	435*
PISA 2018	427	418	426
Average 3-year trend in mean performance	+0.6	-2.0	+0.4
Short-term change in mean performance (2015 to 2018)	-9.5	-0.3	-9.6*
Overall performance trajectory	U-shaped (more positive over more recent years)	flat	flat
Proficiency levels	**Reading (2009 to 2018)**	**Mathematics (2012 to 2018)**	**Science (2006 to 2018)**
Percentage-point change in top-performing students (Level 5 or 6)	-0.2	-0.3	-0.7*
Percentage-point change in low-achieving students (below Level 2)	-0.0	-5.1	+1.7
Variation in performance	**Reading (2003 to 2018)**	**Mathematics (2003 to 2018)**	**Science (2006 to 2018)**
Average trend amongst the highest-achieving students (90th percentile)	-5.8*	-5.4*	-1.9
Average trend amongst the lowest-achieving students (10th percentile)	+8.4*	+3.1*	+4.0*
Gap in learning outcomes between the highest- and lowest-achieving students	narrowing gap	narrowing gap	narrowing gap

* indicates statistically significant trends and changes, or mean-performance estimates that are significantly above or below PISA 2018 estimates.

Note: Differences between PISA 2003-2012 scores and PISA 2015-2018 scores in Uruguay may also reflect a different treatment of non-reached items (missing answers to items placed at the end of the test). See ANEP, INEEd and UDELAR (2019), *Informe del grupo técnico para la comparabilidad de los resultados de PISA 2015 con anteriores ciclos de la evaluación en Uruguay.*

Source: OECD, PISA 2018 Database, Tables I.B1.7–I.B1.15 and I.B1.28–I.B1.30.

In Uruguay, PISA 2018 performance in all three subjects was close to the levels observed in its first participation in 2003 (or 2006 for science). The poorest performance in all three subjects was observed in 2012, after which performance returned to previous levels. A peak in reading and science performance was observed in 2015. However, this description hides changes in the performance distribution over time. In all three subjects, the performance of the lowest-achieving students improved since Uruguay first participated in PISA, while there was either a drop or a lack of significant change in performance amongst the highest-achieving students. These trends have resulted in a narrowing of the gap between the highest- and lowest-achieving students over the period.

Uruguay increased coverage of its 15-year-old population since 2003: in 2018, PISA covered 78% of the country's 15-year-olds, compared to 63% in 2003 and 2009. Greater enrolment often involves the inclusion of relatively weaker students; thus maintaining performance at the same level while enrolment increases is often a sign of improvement in the education system. On the assumption that 15-year-olds who were excluded would have performed below the median if they had sat the PISA assessment, Uruguay saw an improvement in the performance of the median 15-year-old by 15 score points in reading, 7 score points in mathematics and 7 score points in science every three years (Tables I.B1.34-I.B1.36).

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