THE INDICATORS IN SUBJECTS OF STUDENTS IN STUDY PISA 2022 FOR COUNTRIES AND ECONOMIES

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Abstract. This article analyzes the performance of students in subjects in countries and economies participating in the international study PISA 2022. It also compares the performance of countries and economies with the average performance of the OECD organization.

Keywords: Organization of Economic Co-operation and Development (OECD), PISA Research, performance, equity in education, trends in equity, content, assessment, questionnaires, ESCS - PISA index of economic, social, and cultural status.

What is PISA?

Launched by the Organization of Economic Co-operation and Development (OECD) in 1997, the PISA program assesses 15-year-old students' knowledge of reading, mathematics and science, and their ability to apply what they learn in school to real-life situations. PISA studies were conducted in 2000, 2003, 2006, 2009, 2012, 2015, 2018 and 2022; preparations for the PISA 2025 study are now underway. PISA is a systematic program that provides insight into education policy and practice and helps track trends in student achievement in skills and knowledge across countries and within different demographic subgroups within each country. Through PISA results, policymakers can assess the skills and knowledge of students in their own countries relative to other countries, set policy goals against measurable goals achieved in other education systems, and learn from the policies and practices of countries that have made positive changes. PISA scores not only determine whether students can improve their knowledge; rather, it allows us to determine how well students can apply what they have learned and apply this knowledge to unfamiliar situations, both in and out of school.

Through questionnaires administered to students and school principals, the PISA survey also gathers information about students' home environments, their approaches to education, and their learning environment. The PISA assessment process, combined with data collected through various questionnaires, allows for the identification of the following three main types of results:

• the main indicators that provide the basic description of students' skills and knowledge;

• survey-based indicators of how such skills relate to various demographic, social, economic, and educational variables, and to broader learning outcomes such as academic performance and well-being;

• Trend indicators showing changes in mean scores since the country's second participation in PISA, changes in outcomes among students, and relationships between baseline variables and student-level, school-level, and system-level outcomes.

The score for each participating country in each test subject is the average of the scores of all students in that country. Average PISA scores can be used to rank participating countries and economies according to their achievement in reading, mathematics and science. In the PISA study,

the total score for all subjects is not combined, but instead a score is assigned for each subject area, which can be used to determine the average score for each subject area.

For each subject assessed, PISA reports student performance on a six-point scale. Assessment items of similar complexity are used to describe each proficiency level in terms of what students know and can do at a given level. Thus, PISA can describe the performance of an education system in terms of the skills and knowledge that students acquire by the age of 15, providing a more detailed description than just a single number or level.

PISA is an ongoing program that allows the development of a range of data to track long-term trends in student knowledge and skills in different countries and different demographic subgroups within each country. Policymakers around the world use PISA results to assess the knowledge and skills of students in their countries/economies relative to other participating countries/economies, to develop guidelines for improving the education provided and/or learning outcomes, and to understand the relative strengths and weaknesses of their education systems.

Introduction

The PISA 2022 study assesses reading, science and mathematics as a priority area. Today, being knowledgeable in mathematics does not consist in repeating simple mathematical operations (procedures). In contrast, PISA considers a mathematically literate person to be someone who can solve complex real-life problems, reason mathematically, and find solutions through mathematical expression, application, and interpretation.

The main concern of politicians in Uzbekistan and around the world is to provide citizens with the necessary knowledge and skills to realize their full potential, contribute to an increasingly interconnected world, and ultimately lead a better lifestyle. Student achievement indicators from PISA are designed to track how close countries are to meeting these goals.

The information obtained from the study is a valuable resource that can greatly contribute to Uzbekistan's current initiatives and future efforts in the field of education. It is very important that we implement the collected conclusions strategically at the end of the project. The real impact of our efforts lies in the meaningful and meaningful use of data to advance educational policy and practice.

Over the past two decades, PISA has become the world's first research benchmark for comparing the quality, equity, and effectiveness of educational outcomes across countries and an influential force in education reform. It helped policymakers reduce the cost of political action by supporting difficult decisions with evidence, but it also increased the political cost of inaction by highlighting areas where policy and practice were unsatisfactory.

What pupils know and can do: student performance

Student performance in mathematics

• Singapore scored significantly higher than all other countries/economies in mathematics (575) and outperformed all other countries and economies in mathematics, along with Hong Kong (China), Japan, Korea, Macau (China) and Chinese Taipei. Another 17 countries, from Estonia (510 points) to New Zealand (479 points), also scored above the OECD average (472 points).

• It was found that an average of 69% of students in OECD countries have at least basic (fundamental) knowledge of mathematics. This means that they begin to demonstrate the ability and initiative to use mathematics in simple real-life situations.

• In 16 of the 81 countries/economies participating in PISA 2022, more than 10% of students achieved a literacy level of 5 or 6, i.e., they are high achievers: they understand that the

problem is quantitative in nature and can represent complex mathematical models to solve. In contrast, in 42 countries/economies, less than 5% of students achieved top results.

Pupil performance in reading and science

• Singapore scored higher in reading (543) and science (561) than all other countries/economies. Singapore was followed by Ireland, Estonia, Japan, Korea and Chinese Taipei and 14 other education systems from Macau (China) (510) to Italy (482) above the OECD average (476) for reading.

• The educational systems with the highest results in natural sciences are Singapore, Japan, Macao (China) and Chinese Taipei, Korea, Estonia, Hong Kong (China) and Canada. Finland scored as well as Canada in science. In addition to these nine countries and economies, 15 other education systems - from Australia (507 points) to Belgium (491 points) - scored above the OECD science average (485 points).

• In OECD countries, three out of four students have basic knowledge of reading and science.

• An average of 7% of students across OECD countries in reading and natural sciences achieved the highest literacy (proficiency) level - level 5 or 6. In 13 countries/economies, more than 10% of students achieved the best reading performance. In 14 countries/economies, more than 10% of students achieved the best performance in science.

From these indicators and from the comparison of the average indicators of Uzbekistan with other countries, the following conclusions can be drawn in three areas (mathematics, reading and natural sciences):

Uzbekistan's performance is below the OECD average in all three areas. Uzbekistan's results in mathematics are 108 points below the OECD average, 130 points in natural sciences, and 140 points below the OECD average in reading. While most countries appear to be weaker in mathematics than in other areas, this relative weakness is particularly evident in Uzbekistan.

In Uzbekistan, the percentage of students below the basic literacy level in mathematics and reading, as well as natural sciences is high, and the percentage of high-achieving students who have reached the best literacy level in at least one area is low.

Trends in indicators

• Until 2018, the average change in OECD across successive PISA assessments never exceeded four points in mathematics and five points in reading: the average change in OECD in PISA 2022 compared to PISA 2018, the score dropped by almost 15 points in mathematics and by about 10 points in reading. However, the average performance in natural sciences remained stable. The dramatic declines in math and reading are indicative of the significant impact of COVID-19 on most countries.

• Between PISA 2018 and PISA 2022, only four countries and economies improved in all three subjects: Brunei Darussalam, Cambodia, the Dominican Republic and Chinese Taipei.

• A trend analysis of PISA results shows a decade-long decline that began well before the pandemic. Performance in reading and science peaked in 2012 and 2009 respectively, while in mathematics by 2018 Australia, Belgium, Canada, Czech Republic, Finland, Hungary, Iceland, Korea, the decline began in the Netherlands, New Zealand, the Slovak Republic and Switzerland.

• Four countries and economies have broken a long-term downward trend: Colombia, Macau (China), Peru and Qatar. Their results improved on average in all three subjects over the

entire period they participated in PISA. Four more countries participating in PISA (Israel, Republic of Moldova, Singapore and Turkey) saw growth in two out of three subjects.

Equality in education

• The education systems of Canada, Denmark, Finland, Hong Kong (China), Ireland, Japan, Korea, Latvia, Macau (China) and the United Kingdom have a high level of equality according to the PISA standard (taking into account a high level of inclusion and fairness without).

• In each country/economy, the percentage of 15-year-olds enrolled in 7th grade or higher in school ranges from 36% in Cambodia and 48% in Guatemala to 90% or more in 34 countries and economies.

• Socio-economically advantaged students showed an average of 93 points higher in mathematics than the countries of the Organization for Economic Cooperation and Development. The difference in results depending on the socio-economic status of students was higher than 93 points in 22 countries or economies and 50 points or less in 13 countries or economies.

It can be seen that students in Uzbekistan scored lower than students in other countries of OECD. In Uzbekistan, the indicators of students belonging to the country's low-income families are almost equal to those of the least-income students in the OECD countries. Students from higher socio-economic backgrounds in Uzbekistan consistently perform lower than similar students in OECD countries across the scale. In fact, the results of Uzbek students are lower than those of similar students at all levels of socio-economic status in OECD countries.

• According to OECD countries, boys outperformed girls by nine points in mathematics, and girls outperformed boys in reading by 24 points. The difference between boys and girls in natural sciences is not significant.

In Uzbekistan, this result is 6 points in favor of boys. As in all countries and economies participating in the PISA 2022 study, the average reading scores of boys in Uzbekistan are lower than the average reading scores of girls (22 points). However, this difference is less in Uzbekistan than in most of the CIS countries. In Uzbekistan, the achievement gap in natural sciences in favor of girls is less than in other countries (almost 4 points).

• Non-immigrant students scored an average of 29 points higher than immigrant students in mathematics across OECD countries, but non-immigrant students were less likely when socioeconomic status and home language were taken into account, scored only five points higher than immigrant students.

• An average of 8% of students in the OECD area report not eating at least once a week in the past 30 days because they do not have enough money to buy food. In 18 countries/economies, more than 20% of students reported not being able to eat at least once a week.

PISA defines and measures equity in education through two interrelated principles: inclusion and equity. Inclusion means ensuring that all students have at least the necessary basic skills. Equity refers to students' access to quality education and, more precisely, the level of reducing the impact of their living conditions on their educational outcomes. Inclusiveness and equity in education requires that all children, regardless of gender, socioeconomic status, or language spoken at home, have access to educational opportunities that lead to effective learning outcomes.

Although the percentage of high-achieving students in Uzbekistan is not very high, it is worth noting that almost 5% of 15-year-old students achieved mathematics at level 3 or higher - the typical literacy level of 15-year-old students in OECD countries. Almost 2% of students in

Uzbekistan achieved level 3 in reading, and more than 2% of students in science achieved level 3 or higher. These levels of knowledge and skills are important attributes for future citizens and employees, and the tasks facing Uzbekistan are to increase the share of high-achieving students and reduce the socio-economic inequality between low and high-achieving students.

Trends in Equality

• In 51 of the 68 countries/economies with available PISA data, the socio-economic gap in mathematics performance did not change between 2018 and 2022; The gap widened in 12 countries/economies and decreased in five (Argentina, Chile, Philippines, Saudi Arabia and the United Arab Emirates).

• Between 2018 and 2022, the gender gap in mathematics remained unchanged in most countries/economies (57 out of 72 comparable); The gap widened in 11 countries/economies and decreased in four (Albania, Baku [Azerbaijan], Colombia and Montenegro).

Table I.1. Performance in math, reading and science [1/2]

OECD Countries/economies with high average/percentage above average

OECD percentage of low-performing countries/economies below the average

OECD high/low performing countries/economies that are not significantly different from the average

OECD Countries/economies with high rates/percentages below average

OECD percentage of low-performing countries/economies above the average

	Average score in PISA 2022			Long term trend: Average 10-year trend			Short-term changes in indicators (PISA 2018 to PISA 2022)			High and low performing students	
	Mathematics	Reading	Science	Mathematics	Reading	Science	Mathematics	Reading	Science	Percentage of high scores in at least one direction (level 5 or 6)	Low performance percentages in all three areas (below level 2)
	Average	Average	Average	Score difference	Score difference	Score difference	Score difference	Score difference	Score difference	%	%
OECD is average	472	476	485	-7	-4	-7	-15	-10	-2	13,7	16,4
Singapore	575	543	561	6	12	12	6	-7	10	44,5	4,2
Japan	536	516	547	2	2	4	9	12	17	28,7	5,3
Korea	527	515	528	-13	-11	-4	1	1	9	29,7	7,3
Estonia	510	511	526	1	11	-3	-13	-12	-4	20,0	5,2
Switzerland	508	483	503	-12	-7	-11	-7	-1	7	19,4	12,4
canada *	497	507	515	-17	-9	-12	-15	-13	-3	22,7	8,1
Netherlands *	493	459	488	-20	-25	-23	-27	-26	-15	19,0	20,2
Ireland *	492	516	504	-2	-1	-7	-8	-2	8	14,7	7,5
Belgium	489	479	491	-18	-11	-11	-19	-14	-8	15,5	15,2
Denmark *	489	489	494	-9	0	-3	-20	-12	1	12,8	10,3
United Kingdom *	489	494	500	-1	2	-10	-13	-10	-5	17,9	12,0
Poland	489	489	499	5	5	-1	-27	-23	-12	15,3	11,9
Austria	487	480	491	-9	-5	-14	-12	-4	1	14,6	15,5
Australia *	487	498	507	-21	-14	-16	-4	-5	4	20,7	12,1
Czech Republic	487	489	498	-12	1	-9	-12	-2	1	15,5	12,2
Slovenia	485	469	500	-7	-7	-10	-24	-27	-7	13,0	12,0
Finland	484	490	511	-34	-23	-34	-23	-30	-11	17,9	11,5
Latvia *	483	475	494	2	3	-1	-13	-4	7	9,7	10,6
Sweden	482	487	494	-9	-11	-2	-21	-19	-6	17,0	15,2
New Zealand*	479	501	504	-24	-12	-18	-15	-5	-4	19,5	13,7
Lithuania	475	472	484	-4	2	-6	-6	-4	2	10,4	14,4
Germany	475	480	492	-12	2	-17	-25	-18	-11	14,6	16,7
France	474	474	487	-14	-8	-6	-21	-19	-6	12,9	16,8
Spain	473	474	485	-4	-1	-2	m	m	m	10,6	12,9
Hungary	473	473	486	-10	-5	-15	-8	-3	5	11,2	16,5
Portugal	472	477	484	8	7	5	-21	-15	-7	10,1	13,8
Italy	471	482	477	8	1	-6	-15	5	9	10,7	12,9

Vietnam**	469	462	472	m	m	m	m	m	m	6,3	12,2
Norway	468	477	478	-7	-5	-7	-33	-23	-12	13,8	17,5
Malta	466	445	466	3	3	2	-6	-3	9	10,7	21,6
United States*	465	504	499	-8	2	5	-13	-1	-3	18,1	14,8
Slovak Republic	464	447	462	-16	-13	-20	-22	-11	-2	9,5	22,2
Croatia	463	475	483	-1	0	-10	-1	-3	10	9,7	13,6
Iceland	459	436	447	-24	-24	-27	-36	-38	-28	6,8	23,3
Israel	458	474	465	11	13	7	-5	3	3	15,1	21,3
Turkey	453	456	476	14	5	24	0	-10	8	7,3	18,5
Brunei Darussalam	442	429	446	m	m	m	12	21	15	4,5	30,0
Serbia	440	440	447	3	16	4	-8	1	8	5,0	24,5
United Arab Emirates	431	417	432	7	-12	-8	-4	-14	-2	8,8	33,9
Greece	430	438	441	-9	-12	-21	-21	-19	-11	3,9	25,7
Romania	428	428	428	6	15	3	-2	1	2	5,0	33,2
Kazakhstan	425	386	423	10	-4	6	2	-1	26	2,2	32,8
Mongolia	425	378	412	m	m	m	m	m	m	2,3	39,9

Notes: Statistically significant values are in bold (see Appendix A3). * Care should be taken when interpreting the estimates because one or more of the PISA sampling standards were not met (see Appendices A2 and A4 in the Student Guide). Long-term trends are reported for the longest period available since PISA 2003 in mathematics, PISA 2000 in reading and PISA 2006 in science. The OECD average excludes Costa Rica and Spain for short-term fluctuations. Countries and economies are ranked in descending order of average mathematics score in PISA 2022. Source: OECD, PISA 2022 database, I.B1.2.1, I.B1.2.2, I.B1.2.3, I.B1.4.42, tables, I.B1.4.43, I.B1.5.4, I.B1 .5.5 and I.B1.5.6:

Table I.1. Performance in math, reading and science [2/2]

OECD Countries/economies with high average/percentage above average

OECD percentage of low-performing countries/economies below the average

OECD high/low performing countries/economies that are not significantly different from the average

OECD Countries/economies with high rates/percentages below average

OECD percentage of low-performing countries/economies above the average

	Average score in PISA 2022			Long term trend: Average 10-year trend			Short-term changes in indicators (PISA 2018 to PISA 2022)			High and low performing students	
	Mathematics	Reading	Science	Mathematics	Reading	Science	Mathematics	Reading	Science	Percentage of high scores in at least one direction (level 5 or 6)	Low performance percentages in all three areas (below level 2)
	Average	Average	Average	Score difference	Score difference	Score difference	Score difference	Score difference	Score difference	%	%
Bulgaria	417	404	421	3	-5	-11	-19	-16	-3	4,6	38,3
Moldova	414	411	417	14	20	5	-6	-13	-12	1,7	37,1
Qatar	414	419	432	58	59	51	0	12	13	5,2	34,2
Chile	412	448	444	-1	16	2	-6	-4	0	3,6	24,8
Uruguay	409	430	435	-8	3	5	-9	3	10	3,4	30,6
Malaysia	409	388	416	7	-12	1	-32	-27	-21	1,3	40,6
Montenegro	406	405	403	10	9	0	-24	-16	-12	1,5	41,3
Mexico	395	415	410	2	4	1	-14	-5	-9	0,7	38,4
Thailand	394	379	409	-8	-20	-8	-25	-14	-17	1,3	46,3
Peru	391	408	408	26	38	33	-9	8	4	1,3	40,8
Georgia	390	374	384	8	-2	6	-8	-6	1	1,3	51,1
Saudi Arabia	389	383	390	m	m	m	16	-17	4	0,3	48,6
North Macedonia	389	359	380	m	-2	m	-6	-34	-33	0,7	55,8
Costa Rica	385	415	411	-17	-21	-16	-18	-11	-5	1,1	38,1
Colombia	383	409	411	9	12	15	-8	-4	-2	1,5	40,7
Brazil	379	410	403	10	7	5	-5	-3	-1	2,6	42,2
Argentina	378	401	406	-5	-2	7	-2	-1	2	1,5	42,7
Jamaica*	377	410	403	m	m	m	m	m	m	1,7	43,5
Albania	368	358	376	4	12	-5	-69	-47	-41	0,8	56,2
Indonesia	366	359	383	0	-5	0	-13	-12	-13	0,1	59,0

Morocco	365	339	365	m	m	m	-3	**-20**	**-11**	0,0	68,5
Uzbekistan	364	336	355	m	m	m	m	m	m	0,1	71,4
Jordan	361	342	375	**-8**	m	m	**-39**	m	m	0,0	62,9
Panama*	357	392	388	-4	15	5	4	**15**	**23**	1,2	50,4
Philippines	355	347	356	m	m	m	2	7	-1	0,2	71,3
Guatemala	344	374	373	m	m	m	**10**	5	**8**	0,1	63,8
El Salvador	343	365	373	m	m	m	m	m	m	0,2	62,8
Dominican Republic	339	351	360	m	m	m	**14**	**10**	**25**	0,1	68,4
Paraguay	338	373	368	m	m	m	**11**	3	**10**	0,1	61,1
Cambodia	336	329	347	m	m	m	**12**	**8**	**17**	0,0	82,2

Notes: Statistically significant values are in bold (see Appendix A3). * Care should be taken when interpreting the estimates because one or more of the PISA sampling standards were not met (see Appendices A2 and A4 in the Student Guide). Long-term trends are reported for the longest period available since PISA 2003 in mathematics, PISA 2000 in reading and PISA 2006 in science. The OECD average excludes Costa Rica and Spain for short-term fluctuations. Countries and economies are ranked in descending order of average mathematics score in PISA 2022. Source: OECD, PISA 2022 database, I.B1.2.1, I.B1.2.2, I.B1.2.3, I.B1.4.42, tables, I.B1.4.43, I.B1.5.4, I.B1 .5.5 and I.B1.5.6:

Table I.2. Socio-economic differences in academic performance [1/2]

Countries/economies with lower socioeconomic status than the OECD average

Countries/economies with strong student enrollment rates above the OECD average

Countries/economies with strong socio-economic status/proportion of students not significantly different from the OECD average

Countries/economies with a socioeconomic status above the OECD average

Countries/economies with strong student participation rates below the OECD average

	Coverage Index 3: Coverage of the 15-year-old population	Strength: Percentage of variation in math scores explained by ESCS	Percentage of academically strong students with poor socioeconomic status	The difference between students with good and poor socio-economic status in mathematics	Short-term change in performance in mathematics,by socio-economic background (PISA 2018 to PISA 2022)		
					The difference between good and bad students according to their socio-economic status	Students with poor socio-economic status	Students with a good socio-economic status
		%	%	Score difference	Score difference	Score difference	Score difference
OECD average		15,5	10,2	93	7	-17	-10
Cambodia	0,36	1,9	18,2	21	m	m	m
Uzbekistan	0,88	2,0	19,6	22	m	m	m
Kazakhstan	0,93	3,9	16,8	41	8	0	7
Albania	0,79	4,5	17,1	49	12	-68	-57

Philippines	0,83	4,8	11,6	36	-38	20	-18
Jordan	0,94	5,2	14,5	40	-15	-32	-47
Indonesia	0,85	5,5	15,2	34	-17	-6	-23
United Arab Emirates	0,94	5,8	9,5	68	-35	7	-28
Jamaica*	0,58	6,1	15,2	45	m	m	m
Saudi Arabia	0,81	6,4	14,2	47	-20	27	7
Georgia	0,86	7,8	13,9	65	-12	-1	-13
Morocco	0,76	8,5	15,8	43	-8	1	-7
Iceland	0,94	9,3	11,3	72	2	-36	-34
Montenegro	0,93	9,5	14,0	67	10	-29	-19
Norway	0,91	9,6	12,6	81	12	-31	-19
Malta	0,93	10,0	12,7	83	-9	-1	-10
Dominican Republic	0,64	10,1	12,6	45	-11	17	6
Thailand	0,75	10,1	15,0	61	-10	-22	-32
Canada*	0,92	10,2	12,7	76	7	-18	-11
Mexico	0,64	10,4	11,8	58	-8	-9	-17
United Kingdom*	0,97	11,0	15,2	86	3	-7	-5
Paraguay	0,72	11,2	12,4	66	m	m	m
Qatar	0,94	11,7	7,6	84	-9	4	-5
Greece	0,91	11,8	12,0	76	-6	-16	-21
Japan	0,92	11,9	11,5	81	13	5	18
Guatemala	0,48	12,1	11,2	60	m	m	m
Denmark*	0,84	12,2	10,2	74	3	-23	-19
Finland	0,95	12,4	11,9	83	10	-26	-16
Chile	0,86	12,5	12,8	69	-21	7	-14
North Macedonia	0,91	12,5	12,3	76	-7	-5	-12
Turkey	0,74	12,6	11,7	82	8	-8	0
Korea	1,00	12,6	10,9	97	9	-4	5
Ireland*	1,00	13,0	11,9	74	7	-10	-3
Croatia	0,89	13,0	10,7	82	12	-10	2
Latvia*	0,85	13,2	11,7	75	6	-16	-10
Serbia	0,87	13,4	12,3	81	5	-15	-10
Estonia	0,94	13,4	10,3	81	18	-23	-6
Italy	0,87	13,5	11,3	85	4	-15	-11
Vietnam	0,68	13,8	12,7	78	m	m	m
Spain	0,90	14,2	11,7	86	m	m	m

1. ESCS refers to the PISA index of economic, social and cultural status. 2. Academically strong students are disadvantaged students who score in the highest quartile of students in their country/economy. 3. A socioeconomically advantaged (disadvantaged) student is one who is in the upper (lower) quartile of the ESCS in their country/economy. 4. A positive (negative) score

difference indicates that the difference between strong and weak students in mathematics was larger (smaller) in PISA 2022 than in PISA 2018. 5. A positive (negative) score difference indicates that the results have improved (decreased). Between PISA 2018 and PISA 2022 between disadvantaged students or advantaged students. Notes: Statistically significant values are in bold (see Appendix A3). * Care should be taken when interpreting the estimates because one or more of the PISA sampling standards were not met (see Appendices A2 and A4 in the Student's Guide). The OECD average excludes Costa Rica and Spain for short-term fluctuations. Countries and economies are ranked in order of increasing percentage of variance in math performance explained by the ESCS. Source: OECD, PISA 2022 database, I.B1.4.1, I.B1.4.3 and I.B1.5.19. tables:

Table I.2. Socio-economic differences in academic performance [2/2]

▭ Countries/economies with lower socioeconomic status than the OECD average
▭ Countries/economies with strong student enrollment rates above the OECD average
▭ Countries/economies with strong socio-economic status/proportion of students not significantly different from the OECD average

Countries/economies with a socioeconomic status above the OECD average
Countries/economies with strong student participation rates below the OECD average

	Coverage Index 3: Coverage of the 15-year-old population	Strength: Percentage of variation in math scores explained by ESCS	Percentage of academically strong students with poor socioeconomic status	The difference between students with good and poor socio-economic status in mathematics	Short-term change in performance in mathematics, by socio-economic background (PISA 2018 to PISA 2022)		
					The difference between good and bad students according to their socio-economic status	Students with poor socio-economic status	Students with a good socio-economic status
		%	%	Score difference	Score difference	Score difference	Score difference
El Salvador	0,61	14,4	10,2	57	m	m	m
Australia*	0,90	14,6	9,9	101	20	-13	7
Brazil	0,76	14,8	10,2	77	-13	0	-13
United States*	0,86	14,9	10,6	102	5	-12	-7
Sweden	0,89	15,0	9,9	99	15	-24	-9
Netherlands*	0,79	15,1	10,6	106	17	-34	-18
Argentina	0,84	15,4	10,2	75	-21	12	-9
Moldova	0,97	15,6	10,1	82	-16	3	-12
Slovenia	1,00	15,7	9,4	91	5	-30	-25
New Zealand*	0,90	15,8	8,6	102	15	-23	-9

Brunei Darussalam	0,98	16,0	10,9	86	0	13	14
Colombia	0,73	16,2	9,8	79	2	-7	-5
Poland	0,89	16,3	8,6	96	5	-29	-24
Lithuania	0,92	16,5	9,8	92	2	-4	-2
Singapore	0,95	17,0	10,2	112	22	-6	16
Bulgaria	0,80	17,2	7,4	108	5	-21	-16
Peru	0,86	17,3	7,4	86	-11	-2	-13
Uruguay	0,85	17,9	10,4	91	-1	-3	-4
Malaysia	0,75	18,1	9,3	82	-5	-26	-31
Mongolia	0,87	18,1	8,8	94	m	m	m
Portugal	0,93	18,2	9,4	101	-3	-17	-20
Germany	0,92	18,7	9,5	111	7	-26	-18
Austria	0,89	19,4	8,2	106	14	-20	-5
Israel	0,90	19,6	7,7	124	17	-11	7
Panama*	0,58	20,0	7,8	77	-5	7	2
Switzerland	0,91	20,8	8,2	117	17	-15	2
France	0,93	21,5	7,4	113	5	-22	-16
Belgium	0,99	21,8	8,2	117	1	-19	-18
Czech Republic	0,91	22,0	7,3	116	8	-18	-9
Hungary	0,86	25,1	8,2	121	7	-12	-5
Slovak Republic	0,96	25,7	6,1	133	16	-32	-15
Romania	0,76	25,8	6,6	132	24	-11	13
Costa Rica	0,78	m	m	m	m	m	m
Macau (China)	0,98	5,0	16,8	55	20	-14	6
Baku (Azerbaijan)	0,73	5,2	14,5	54	1	-25	-25
Kosovo	0,86	5,7	17,7	39	-4	-8	-12
Hong Kong (China)*	0,81	5,8	16,7	65	7	-13	-5
Palestinian Authority	0,78	7,4	12,3	50	m	m	m
Cyprus	0,94	10,9	11,6	92	17	-35	-18
Ukrainian regions (18 out of 27)	0,42	13,8	10,5	84	m	m	m
Chinese Taipei	0,93	15,7	10,1	119	27	3	30

1. ESCS refers to the PISA index of economic, social and cultural status. 2. Academically resilient students are disadvantaged students who score in the highest quartile of academic performance among students in their country/economy. 3. A socioeconomically advantaged (disadvantaged) student is one who is in the upper (lower) quartile of the ESCS in their country/economy. 4. A positive (negative) score difference indicates that the difference between strong and weak students in mathematics was larger (smaller) in PISA 2022 than in PISA 2018. 5. A positive (negative) score difference indicates that the results have improved (decreased).

Between PISA 2018 and PISA 2022 between disadvantaged students or advantaged students. Notes: Statistically significant values are in bold (see Appendix A3). * Care should be taken when interpreting the estimates because one or more of the PISA sampling standards were not met (see Appendices A2 and A4 in the Student's Guide). The OECD average excludes Costa Rica and Spain for short-term fluctuations. Countries and economies are ranked in order of increasing percentage of variance in math performance explained by the ESCS. Source: OECD, PISA 2022 database, Tables I.B1.4.1, I.B1.4.3 and I.B1.5.19.

Table I.3. Gender differences in indicators [1/2]

	Mathematics indicators				Study indicators				Indicators on natural science			
	Girls	Boys	The difference between boys and girls	Short-term change in the gender gap (from PISA 2018 until PISA 2022)	Girls	Boys	The difference between boys and girls	Short-term changes in the gender gap (from PISA 2018 to PISA 2022	Girls	Boys	The difference between boys and girls	Short-term changes in the gender gap (from PISA 2018 to PISA 2022)
	Average score	Average score	Score difference	Score difference	Average score	Average score	Score difference	Score difference	Average score	Average score	Score difference	Score difference
OECD average	468	477	9	4	488	464	-24	5	485	485	0	2
Albania	378	359	-19	-14	379	339	-40	-2	391	362	-28	-12
Jordan	368	353	-15	-9	364	318	-46	m	390	358	-33	m
Philippines	362	348	-14	-3	364	329	-35	-8	363	349	-15	-11
Jamaica*	384	370	-13	m	426	391	-35	m	412	392	-20	m
Brunei Darussalam	448	437	-11	-4	447	413	-34	-4	452	440	-12	-5
Malaysia	414	403	-10	-4	404	373	-31	-5	423	410	-13	-7
Qatar	418	410	-8	16	440	399	-40	25	443	422	-21	18
United Arab Emirates	435	428	-7	2	440	396	-45	12	441	424	-17	9
Indonesia	369	362	-6	3	370	347	-23	2	385	380	-5	2
North Macedonia	392	386	-6	1	372	346	-26	26	388	373	-15	4
Thailand	397	391	-6	10	391	365	-27	12	414	404	-10	9
Bulgaria	420	415	-6	-4	422	389	-33	7	430	413	-16	-1
Mongolia	427	422	-6	m	391	366	-25	m	420	405	-15	m
Georgia	393	387	-5	-1	392	357	-35	3	391	377	-14	0

Finland	487	482	-5	1	513	468	-45	7	522	500	-22	2
Dominican Republic	341	337	-4	-1	367	333	-34	-3	367	353	-13	-4
Cambodia	338	334	-4	-5	338	318	-20	-4	351	342	-9	-5
Morocco	367	363	-4	-5	350	329	-22	4	370	361	-9	0
Slovenia	485	484	-2	-2	491	447	-44	-2	508	493	-15	-5
Norway	469	468	-1	6	498	456	-42	5	485	472	-13	-3
Montenegro	406	405	0	-9	423	388	-36	-5	407	399	-8	-3
Kazakhstan	426	425	0	-2	400	373	-27	-1	426	421	-5	2
Slovak Republic	463	465	1	-3	462	433	-30	5	466	459	-7	-1
Malta	465	467	1	14	465	426	-39	10	472	460	-12	9
Saudi Arabia	388	390	2	15	399	366	-33	22	398	383	-15	13
Sweden	481	483	2	3	506	469	-37	-2	498	489	-8	-1
Iceland	457	461	3	13	454	419	-35	5	454	440	-13	-5
Panama*	355	358	4	-4	401	382	-19	-5	387	389	2	1
Moldova	412	416	4	6	427	397	-30	10	421	413	-8	3
Romania	425	430	5	0	442	415	-26	7	428	427	-1	-1
Korea	525	530	5	1	533	499	-34	-11	530	526	-3	-7
Lithuania	473	478	5	8	487	456	-31	8	487	482	-6	0
Poland	486	492	6	4	503	475	-29	4	500	498	-2	-1
Turkey	450	456	6	1	468	444	-25	0	478	473	-5	2
Greece	427	433	6	6	451	426	-25	17	446	436	-10	1
Uzbekistan	361	367	6	m	347	325	-22	m	357	353	-4	m
Estonia	507	513	6	-2	525	498	-27	4	528	524	-4	1
El Salvador	340	347	6	m	371	358	-13	m	372	374	2	m
Croatia	460	466	6	-2	493	459	-34	-1	488	477	-11	-7
Czech Republic	483	491	7	4	503	474	-29	4	499	497	-2	0
Belgium	486	493	8	-4	492	465	-28	-6	491	491	0	-5

1. A positive (negative) score difference indicates that the difference between boys and girls in mathematics was larger (smaller) in PISA 2022 than in PISA 2018. Notes: Statistically significant values are in bold (see Appendix A3). * Care should be taken when interpreting the estimates because one or more of the PISA sampling standards were not met (see Appendices A2 and A4 in the Student Guide). The OECD average excludes Costa Rica and Spain for short-term fluctuations. Countries and economies are ranked in descending order of the gender gap in math scores. Source: OECD, PISA 2022 database, tables I.B1.4.17, I.B1.4.18, I.B1.4.19, I.B1.5.40, I.B1.5.43 and I.B1.5.46.

Table I.3. Gender differences in indicators [2/2]

	Mathematics indicators			Study indicators			Indicators on natural science		
			Short-term			Short-term		The differe	Short-term

	Girls	Boys	The difference between boys and girls	gender gap change (PISA 2018 from until PISA 2022)	Girls	Boys	The difference between boys and girls	gender gap change (PISA 2018 from until PISA 2022)	Girls	Boys	nce between boys and girls	gender gap change (PISA 2018 from until PISA 2022)
	Average score	Average score	Score difference	Score difference	Average score	Average score	Score difference	Score difference	Average score	Average score	Score difference	Score difference
Brazil	375	383	8	0	419	402	-17	8	400	406	5	7
Japan	531	540	9	-1	524	508	-17	4	546	548	2	-1
Colombia	378	387	9	-11	414	403	-12	-1	408	414	6	-6
Latvia*	478	488	10	3	488	461	-28	5	493	495	1	10
France	469	479	10	3	484	464	-20	5	488	487	-1	0
Spain	468	478	10	m	487	462	-25	m	482	487	5	m
Vietnam**	464	475	10	m	471	453	-18	m	470	475	6	m
New Zealand*	474	484	10	2	514	488	-26	3	504	504	-1	-2
Portugal	467	477	11	2	487	466	-21	3	485	484	-2	-7
Netherlands*	487	498	11	9	473	447	-26	3	487	489	2	11
Switzerland	502	513	11	4	495	472	-24	7	502	503	0	1

Uruguay	403	414	11	3	438	423	-15	8	431	440	9	5
Serbia	434	445	11	8	453	428	-26	10	449	446	-4	1
Argentina	372	383	11	-4	408	394	-14	2	403	409	6	-4
Israel	452	463	11	20	486	462	-23	25	465	465	0	19
Australia*	481	493	11	5	509	487	-22	10	506	508	2	1
Germany	469	480	11	4	490	470	-19	6	492	493	0	1
Paraguay	332	343	11	-2	382	364	-19	-5	367	370	3	-2
Denmark*	483	495	12	8	499	479	-21	9	490	497	7	9
Mexico	389	401	12	0	419	411	-8	3	404	417	14	4
Singapore	568	581	12	8	553	533	-20	4	558	565	7	3
Canada*	491	503	12	7	519	495	-24	5	515	515	1	4
Guatemala	338	351	12	1	379	369	-9	2	370	376	6	1
Ireland*	485	498	13	7	525	507	-18	5	501	507	6	7
United States*	458	471	13	5	515	493	-22	2	496	503	7	6
United Kingdom*	482	496	14	2	503	486	-16	4	496	504	8	6
Hungary	465	480	15	6	481	465	-17	10	484	488	3	-3
Costa Rica	377	392	15	-3	417	414	-3	12	404	418	15	5
Peru	384	399	15	-1	412	404	-8	2	401	415	14	1
Chile	403	420	16	9	451	445	-7	13	436	450	14	11
Austria	478	497	19	6	491	470	-20	8	485	497	11	9
Italy	461	482	21	6	491	472	-19	6	474	481	7	3
Cyprus	426	411	-16	-7	409	355	-54	-7	426	397	-29	-8
Palestinian Authority	373	357	-16	m	371	322	-49	m	382	352	-30	m
Baku (Azerbaijan)	401	394	-7	-15	385	347	-37	-12	387	374	-12	-7
Kosovo	355	355	0	-4	355	330	-25	0	360	354	-6	0
Chinese Taipei	544	550	6	2	529	502	-27	-5	536	539	3	2
Hong Kong (China)*	536	544	9	14	512	489	-23	12	520	520	0	9
Ukrainian regions (18 out of 27)	436	446	10	m	439	416	-23	m	450	450	-1	m
Macau (China)	544	559	15	12	518	503	-14	8	542	544	2	4

1. A positive (negative) score difference indicates that the difference between boys and girls in mathematics was larger (smaller) in PISA 2022 than in PISA 2018. Notes: Statistically significant values are in bold (see Appendix A3). * Care should be taken when interpreting the estimates because one or more of the PISA sampling standards were not met (see Appendices A2 and A4 in the Student Guide). The OECD average excludes Costa Rica and Spain for short-term fluctuations. Countries and economies are ranked in descending order of the gender gap in math scores. Source: OECD, PISA 2022 database, tables I.B1.4.17, I.B1.4.18, I.B1.4.19, I.B1.5.40, I.B1.5.43 and I.B1.5.46:

Table I.4. Immigrant students [1/2]

☐ Countries/economies with a higher average math score or percentage of immigrant students than the OECD average

☐ Countries/economies with average math scores or percentage of immigrant students not significantly different from the OECD averager

☐ Countries/economies with a lower average math score or percentage of immigrant students than the OECD averager

	Percentage of immigrant students	Mathematics indicator			In mathematics indicators difference in scores related to immigrant background	
		Nonimmigrant students	Second generation immigrant students	First generation immigrant students	After taking into account students socio-economic status	After taking into account students socioeconomic status and language spoken at home
	%	Average	Average	Average	Score difference	Score difference
OECD average	12,9				-15	-5
Qatar	59,1	378	428	458	66	61
United Arab Emirates	52,9	390	466	489	88	88
Switzerland	34,9	528	477	472	-19	-5
Canada*	34,4	497	517	499	16	15
Australia*	29,3	483	509	506	26	25
Singapore	28,6	568	608	591	15	19
New Zealand*	28,5	479	500	482	16	24
Austria	26,6	505	451	439	-25	-5
Germany	25,8	495	457	398	-32	-8
United States*	23,7	470	466	441	16	28
Sweden	21,3	499	449	423	-34	-27
Belgium	20,5	504	452	439	-25	-17
United Kingdom*	20,1	494	507	483	12	16
Ireland*	17,4	495	489	484	0	0
France	16,5	485	438	425	-17	-9
Norway	15,9	479	448	436	-9	-11
Israel	15,1	467	468	410	1	11
Spain	15,1	481	459	433	-7	-5
Netherlands*	13,6	508	460	431	-27	-10
Greece	13,2	438	404	373	-13	-1
Costa Rica	12,5	387	373	367	m	m
Malta	11,9	469	451	484	6	5

Jordan	11,5	363	376	364	10	10
Portugal	11,3	477	461	434	-25	-20
Saudi Arabia	10,8	386	412	418	27	27
Denmark*	10,7	497	445	437	-28	-21
Serbia	10,7	441	448	445	2	3
Italy	10,7	476	453	430	-3	6
Slovenia	9,8	492	447	424	-29	-6
Croatia	8,8	466	451	459	-5	-1
Estonia	8,7	514	492	475	-20	-18
Brunei Darussalam	7,9	439	475	505	47	40
Iceland	7,4	464	436	419	-15	-2
Kazakhstan	7,4	426	430	431	12	12
Chile	6,9	417	435	381	-18	-17
Finland	6,8	491	442	413	-42	-29
Montenegro	6,2	407	417	402	-2	1
Argentina	5,3	380	375	365	4	11
Panama*	4,5	358	416	410	42	48
Dominican Republic	4,2	345	311	332	-16	-12
Czech Republic	4,1	489	484	443	-13	22

1. Second-generation immigrant students are those who were born in the country of assessment but whose parent(s) were born in another country. 2. First-generation immigrant students are those who were born outside the country of assessment and whose parents were also born in another country. Notes: Statistically significant values are in bold (see Appendix A3). * Care should be taken when interpreting the estimates because one or more of the PISA sampling standards were not met (see Appendices A2 and A4 in the Student Guide). Countries and economies are ranked in descending order of the percentage of immigrant students. Source: OECD, PISA 2022 database, Tables I.B1.7.1, I.B1.7.17 and I.B1.7.53.

Table I.4. Immigrant students [2/2]

☐ Countries/economies with a higher average math score or percentage of immigrant students than the OECD average

☐ Countries/economies where average math scores or percentage of immigrant students are not significantly different from the OECD average

Countries/economies with a lower average math score or percentage of immigrant students than the OECD average

	Mathematics indicator			In mathematics indicators difference in scores related to immigrant background	
				After taking	After taking into account students
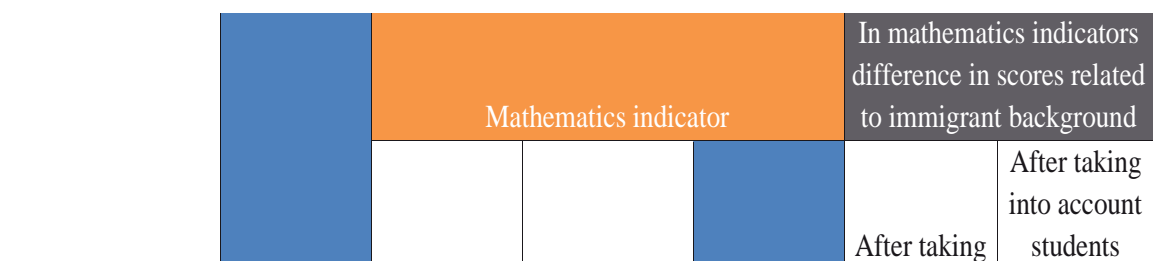
	Percentage of immigrant students	Nonimmigrant students	Second generation immigrant students	First generation immigrant students	into account students socio-economic status	socioeconomic status and language spoken at home
	%	Average score	Average score	Average score	Score difference	Score difference
Latvia*	3,3	484	491	496	3	8
Colombia	2,9	387	c	366	-22	-22
Thailand	2,5	397	364	366	-12	-10
Hungary	2,2	474	499	462	7	12
Paraguay	2,1	342	352	363	10	19
Philippines	2,0	359	278	319	-78	-74
North Macedonia	2,0	393	341	366	-44	-39
Lithuania	1,8	477	453	479	-14	-5
Slovak Republic	1,8	467	459	454	-16	17
Moldova	1,8	416	418	378	-18	-17
Turkey	1,7	455	c	410	-55	-44
Uruguay	1,6	411	c	425	-10	-7
Malaysia	1,5	411	387	c	-15	-16
Mexico	1,5	398	352	325	-56	-52
Jamaica*	1,2	383	c	c	-38	-32
Peru	1,2	394	c	388	-31	-31
Poland	1,2	492	c	435	-45	-30
Georgia	1,1	396	341	374	-40	-32
Bulgaria	1,1	424	c	413	-34	-22
Albania	1,1	375	c	c	-52	-51
Uzbekistan	1,0	365	336	c	-30	-31
Guatemala	0,8	350	c	c	-23	-21
Japan	0,7	537	c	c	-29	12
El Salvador	0,7	346	c	c	-29	-25
Morocco	0,7	367	c	324	-59	-58
Romania	0,6	431	c	c	-44	-33
Brazil	0,5	384	c	c	-46	-31
Indonesia	0,4	367	303	c	-88	-89
Korea	0,4	529	c	c	c	c
Cambodia	0,4	340	c	c	c	c
Mongolia	0,4	427	c	c	c	c
Vietnam	0,1	471	c	c	c	c
Macau (China)	60,3	543	558	564	26	25
Hong Kong	39,5	547	542	527	7	14

(China)*						
Cyprus	19,5	424	419	439	20	10
Baku (Azerbaijan)	4,4	404	399	385	-11	-10
Palestinian Authority	2,2	368	359	329	-32	-29
Kosovo	1,4	358	340	c	-17	-17
Ukrainian regions (18 out of 27)	0,9	439	c	c	-14	-18
Chinese Taipei	0,7	549	c	c	-56	-47

Second-generation immigrant students are those who were born in the country of assessment but whose parent(s) were born in another country. 2. First-generation immigrant students are those who were born outside the country of assessment and whose parents were also born in another country. Notes: Statistically significant values are in bold (see Appendix A3). * Care should be taken when interpreting the estimates because one or more of the PISA sampling standards were not met (see Appendices A2 and A4 in the Student Guide). Countries and economies are ranked in descending order of the percentage of immigrant students. Source: OECD, PISA 2022 database, Tables I.B1.7.1, I.B1.7.17 and I.B1.7.53.

Information for all tables is available on the Internet:

StatLink 2 https://stat.link/d84fig

Key aspects of the PISA 2022 study

Content field

PISA 2022 focuses on mathematics as sub-areas of assessment in reading, science and creative thinking. In each cycle of the PISA study, one subject is tested in detail, which accounts for almost half of the total test time. As in 2003 and 2012, in 2022, the main subject, that is, the priority direction, was mathematics. Reading was prioritized in 2000, 2009 and 2018, and science in 2006 and 2015.

With this rolling timetable, a comprehensive analysis of progress is provided every nine (or 10) years in each of the three main subjects; and trend analysis is offered every three (or four) years. As this cycle has been postponed from 2021 to 2022 due to the COVID-19 pandemic, this cycle will produce results one year later than previous cycles.

Creative thinking has been assessed as an innovative area for the first time in PISA 2022.

The PISA 2022 Assessment and Analytical Framework (OECD, 2023) provides definitions and detailed descriptions of the subjects assessed in PISA 2022:

• Mathematical literacy is defined as students' ability to express, apply, and interpret mathematics to reason mathematically and solve problems in a variety of real-world contexts. It includes concepts, procedures, facts, and tools for describing, explaining, and predicting phenomena. It helps people make informed judgments and decisions, and become constructive, active and reflective citizens of the 21st century.

• Reading literacy means the ability of students to understand, use, evaluate, reflect, and deal with texts in order to achieve their goals, develop their knowledge and potential, and participate in community life.

• Science literacy is defined as the ability of students to engage with science-related issues and science ideas as reflective citizens. A scientifically literate person is ready to engage in reasoned discourse about science and technology, which requires competencies for scientific explanation of phenomena, evaluation and design of scientific research, and scientific interpretation of data and evidence.

• Creative thinking means the ability of students to effectively participate in the generation, evaluation and improvement of ideas, as a result of which original and effective solutions, knowledge gains and effective expression of imagination can be achieved.

PISA 2022 also includes an assessment of youth financial literacy, which is optional for countries and economies.

Student participation and coverage

About 690,000 students were assessed in 2022, out of nearly 29 million 15-year-olds in schools in 81 countries and economies.

PISA students are aged between 15 years and 3 months and 16 years and 2 months at the time of assessment, and have completed at least 6 years of formal schooling. Applying this age across countries and over time gives PISA the knowledge and skills of individuals born in the same year and still in school at age 15, despite varying school and out-of-school educational histories. allows you to constantly compare your skills. They can enroll in any type of institution, participate in full-time or part-time education, academic or vocational programs, public or private schools, or foreign schools within the country.

The number of pupils participating in PISA is determined by the PISA Technical Standards as the pupils excluded from participation (see Annex A2). As a reasonable estimate, the overall within-country margin of error is below 5% to ensure that any deviations from the national averages remain within plus or minus five points, usually on the order of two standard errors. should be

Expulsions can be made through participating schools or students participating in the schools. There are several reasons why a school or student may be excluded from PISA. Schools may be excluded because they are located in remote areas and are inaccessible, too small, or because of organizational or operational factors that prevent them from participating. Students may have been excluded due to intellectual disability or limited assessment language.

Assessment of pupils

As in 2015 and 2018, PISA 2022 used computer-based tests in most countries and economies, and the assessment lasted a total of two hours per student. Computer-administered tests in mathematics and reading used a multilevel adaptive approach, in which students were assigned a block of test items based on their performance in previous blocks.

The test items consisted of a mixture of multiple-choice questions and questions that required students to write their own answers. The questions are divided into groups based on a passage that reflects a real-life situation. More than 15 hours of tests were covered in reading, math, science, and creative thinking, with different students taking different combinations of test items.

There were six different types of test forms representing different combinations of two of the four domains (ie, the three core domains and the innovation domain). Typically, 94 percent of students in each country/economy took 60 minutes of math as the major domain and another 60 minutes in one of three minor or innovative domains (reading, science, or creative thinking).

In addition, 6 percent of students received test forms consisting of two sub-areas. Each test form has sufficient sample size to allow psychometric analysis and assessment of all tasks in each country/economy and relevant subgroups within the country/economy, such as boys and girls or students from different social and economic backgrounds filled in by students.

In addition, PISA 2022 retained the paper-based version of the assessment, which included only trend questions used in previous paper-based assessments. The evaluation based on this paper was carried out in four countries: Cambodia, Guatemala, Paraguay and Vietnam.

The financial literacy assessment has been proposed again as an optional computer-based test in PISA 2022. It was based on a revised framework based on the updated PISA 2022 framework. Cognitive tools include trending questions designed specifically for PISA 2022 and a new set of interactive questions.

Conduct surveys

Students answered the survey, which took about 35 minutes to complete. The questionnaire is aimed at obtaining information about students' attitudes, character and beliefs, home, school and educational experiences. School principals completed a questionnaire covering school management and organization and learning environment. Both students and school leaders answered questions from the Global Crises module in their survey. These questions are aimed at eliciting their perspectives on how learning is organized when schools are closed due to the COVID-19 pandemic.

Some countries/economies also distributed additional questionnaires to obtain additional information. These include: a questionnaire for teachers asking about themselves and their teaching practices; and for parents, their attitudes and involvement in their child's schooling and learning.

Countries/economies may also choose to distribute two other optional student surveys: the Student Computer Literacy Survey and the Student Well-Being Survey. A financial literacy survey was also distributed to students in countries/economies that had a voluntary financial literacy assessment.

How did countries score in PISA?

What does the data tell us?

• Singapore scored significantly higher on average than all other countries and economies participating in PISA 2022 in mathematics (575 points), reading (543 points) and science (561 points).

• In mathematics, six East Asian educational systems (Hong Kong [China], Japan, Korea, Macau [China], Singapore, and Chinese Taipei) outperformed all other countries and economies. In terms of reading, the education systems of Singapore, Ireland scored the highest, as did Estonia, Japan, Korea and Chinese Taipei, and outperformed 75 other countries and economies. The six East Asian countries/economies, Canada and Estonia are the top performing countries in natural sciences.

• The difference between the highest and lowest performing countries in mathematics was 153 points among OECD countries and 238 points among all education systems participating in PISA 2022.

• The difference between the 90th percentile (only 10% of students scored high) and the 10th percentile (only 10% of students scored low) in mathematics is greater than 135 points in all

countries and economies. An average of 235 points separates this border across the OECD countries.

PISA measures student performance as the extent to which 15-year-olds leaving compulsory education have acquired the knowledge and skills needed to participate fully in modern societies, particularly in key areas such as reading, mathematics and science. measures.

This article examines student performance in PISA 2022. It provides information on average performance in maths, reading and science for each country and economy, how it compares with other countries and economies, and the average performance in OECD countries. It then examines performance variation within and between countries and economies; for example, it shows how large the gap in scores is between the highest-achieving and lowest-achieving students in each country and economy. It also examines how changes in performance relate to average performance across PISA participating countries and economies. A ranking of student performance across all countries and economies participating in PISA 2022 follows.

Trends in student performance over time are also considered in this article. Both short-term changes between PISA 2018 and 2022 and long-term trajectories of student performance across countries' overall participation in PISA are provided.

Average scores in math, reading, and science

In PISA 2022, the average mathematics score among OECD countries is 472; the average score for study is 476 points; and the average score in natural science was 485 points. Singapore scored significantly higher in mathematics (575 points), reading (543 points) and science (561 points) than all other countries/economies participating in PISA 2022.

Table I.2.1, Table I.2.2 and Table I.2.3 show the averages for each country/economy and show the pairs of countries/economies for which the differences between the averages are statistically significant. For each country/economy shown in the middle column, countries/economies whose averages are not statistically significantly different are in the right column. In these tables, countries and economies are divided into three broad groups: those whose averages are statistically close to the OECD average (marked in light gray); those whose average indicators are higher than the average indicator of OECD (marked in blue); and those with average scores below the ECO average (marked in dark gray).

In mathematics, six East Asian education systems (Hong Kong [China], Japan, Korea, Macau [China], Singapore, and Chinese Taipei) outperformed all other countries and economies (Table I.2.1). A further 17 countries, ranging from Estonia (510 average) to New Zealand (479 average), also scored above the OECD average.

After the best (Singapore) education system in terms of reading, Ireland followed suit with Estonia, Japan, Korea and Chinese Taipei; and exceeded all other countries/economies (Table I.2.1). In addition to these six countries and economies, 14 other education systems scored above the OECD average, ranging from Macau, China (average score of 510) to Italy (average score of 482).

Except for Austria, Belgium, Latvia, the Netherlands and Slovenia, all countries and economies that performed above the OECD average in mathematics also scored above the OECD average in reading. Similarly, except for Italy and the United States, all countries and economies that performed above the OECD average in reading also performed above the OECD average in mathematics.

The education systems with the highest performance in science are Canada, Estonia, Hong Kong (China), Japan, Korea, Macau (China), Singapore and Chinese Taipei (Table I.2.2). Finland scores as well as Canada in science. In addition to these nine countries and economies, 15 other education systems scored above the ECO science average, ranging from Australia (average score of 507) to Belgium (average score of 491).

All countries and economies (with the exception of six countries/economies) performing above the OECD average in science also scored above the OECD average in mathematics and reading. Austria, Belgium, Latvia and Slovenia performed above the OECD average in science and mathematics, but not in reading; The United States performed above the OECD average in science and reading, but not in math; Germany scored above the OECD average in science, but not in math or reading. In both of these subjects, the German average score is not statistically significantly different from the OECD average.

Eighteen countries and economies achieved above the OECD average in mathematics, reading and science (Australia, Canada, Czech Republic, Denmark, Estonia, Finland, Hong Kong [China], Ireland, Japan, Korea, Macau [China], New Zealand, Poland, Singapore, Sweden, Switzerland, Chinese Taipei, and the United Kingdom).

The difference between the highest and lowest performing countries is 153 points in mathematics among OECD countries and 238 points among all education systems participating in PISA 2022. In reading, the gap between the highest and lowest scores is 107 points among OECD countries and 214 points among all education systems participating in PISA 2022. The difference between the highest and lowest performing countries in science is 137 points among OECD countries and 214 points among all education systems participating in PISA 2022.

Table I.2.1. Comparison of indicators of countries and economies in mathematics [1/2]

Statistically significantly higher than the OECD average

Statistically, it does not significantly differ from the OECD averageStatistik significantly lower than the OECD average

Average score	Comparable country/economy	Countries and economies whose average scores are statistically not significantly different from the scores of the comparison countries/economies
575	Singapore	
552	Macau (China)	Chinese Taipei
547	Chinese Taipei	Macau (China), Hong Kong (China)*
540	Hong Kong (China)*	Chinese Taipei, Japan
536	Japan	Hong Kong (China)*, Korea
527	Korea	Japan
510	Estonia	Switzerland
508	Switzerland	Estonia
497	Canada*	Netherlands*
493	Netherlands*	Canada*, Ireland*, Belgium, Denmark*, United Kingdom*, Poland, Austria, Australia*, Czech Republic
492	Ireland*	Netherlands*, Belgium, Denmark*, United Kingdom*, Poland,

		Austria, Australia*, Czech Republic
489	Belgium	Netherlands*, Ireland*, Denmark*, United Kingdom*, Poland, Austria, Australia*, Czech Republic, Slovenia, Finland
489	Denmark*	Netherlands*, Ireland*, Belgium, United Kingdom*, Poland, Austria, Australia*, Czech Republic, Finland
489	United Kingdom*	Netherlands*, Ireland*, Belgium, Denmark*, Poland, Austria, Australia*, Czech Republic, Slovenia, Finland, Latvia*
489	Poland	Netherlands*, Ireland*, Belgium, Denmark*, United Kingdom*, Austria, Australia*, Czech Republic, Slovenia, Finland, Latvia*
487	Austria	Netherlands*, Ireland*, Belgium, Denmark*, United Kingdom*, Poland, Australia*, Czech Republic, Slovenia, Finland, Latvia*, Sweden
487	Australia*	Netherlands*, Ireland*, Belgium, Denmark*, United Kingdom*, Poland, Austria, Czech Republic, Slovenia, Finland, Latvia*, Sweden
487	Czech Republic	Netherlands*, Ireland*, Belgium, Denmark*, United Kingdom*, Poland, Austria, Australia*, Slovenia, Finland, Latvia*, Sweden
485	Slovenia	Belgium, United Kingdom*, Poland, Austria, Australia*, Czech Republic, Finland, Latvia*, Sweden
484	Finland	Belgium, Denmark*, United Kingdom*, Poland, Austria, Australia*, Czech Republic, Slovenia, Latvia*, Sweden, New Zealand*
483	Latvia*	United Kingdom*, Poland, Austria, Australia*, Czech Republic, Slovenia, Finland, Sweden, New Zealand*
482	Sweden	Austria, Australia*, Czech Republic, Slovenia, Finland, Latvia*, New Zealand*, Germany
479	New Zealand*	Finland, Latvia*, Sweden, Lithuania, Germany, France
475	Lithuania	New Zealand*, Germany, France, Spain, Hungary, Portugal, Italy, Vietnam
475	Germany	Sweden, New Zealand*, Lithuania, France, Spain, Hungary, Portugal, Italy, Vietnam, Norway
474	France	New Zealand*, Lithuania, Germany, Spain, Hungary, Portugal, Italy, Vietnam, Norway, United States of America*
473	Spain	Lithuania, Germany, France, Hungary, Portugal, Italy, Vietnam, Norway, United States*
473	Hungary	Lithuania, Germany, France, Spain, Portugal, Italy, Vietnam, Norway, United States*
472	Portugal	Lithuania, Germany, France, Spain, Hungary, Italy, Vietnam, Norway, United States of America*
471	Italy	Lithuania, Germany, France, Spain, Hungary, Portugal, Vietnam, Norway, Malta, United States*, Slovak Republic
469	Vietnam	Lithuania, Germany, France, Spain, Hungary, Portugal, Italy, Norway, Malta, United States*, Slovak Republic, Croatia
468	Norway	Germany, France, Spain, Hungary, Portugal, Italy, Vietnam, Malta, United States*, Slovak Republic, Croatia

466	Malta	Italy, Vietnam, Norway, United States*, Slovak Republic, Croatia
465	United States of America*	France, Spain, Hungary, Portugal, Italy, Vietnam, Norway, Malta, Slovak Republic, Croatia, Iceland, Israel
464	Slovak Republic	Italy, Vietnam, Norway, Malta, United States*, Croatia, Iceland, Israel
463	Croatia	Vietnam, Norway, Malta, United States*, Slovak Republic, Iceland, Israel
459	Iceland	United States*, Slovak Republic, Croatia, Israel
458	Israel	United States*, Slovak Republic, Croatia, Iceland
453	Turkey	Israel
442	Brunei Darussalam	Ukrainian regions (18 of 27), Serbia
441	Ukrainian regions (18 of 27)	Brunei Darussalam, Serbia
440	Serbia	Brunei Darussalam, Ukrainian regions (18 of 27)
431	United Arab Emirates	Greece, Romania
430	Greece	United Arab Emirates, Romania, Kazakhstan, Mongolia
428	Romania	United Arab Emirates, Greece, Kazakhstan, Mongolia
425	Kazakhstan	Greece, Romania, Mongolia
425	Mongolia	Greece, Romania, Kazakhstan, Bulgaria
418	Cyprus	Bulgaria, Moldova
417	Bulgaria	Mongolia, Cyprus, Moldova, Qatar, Chile
414	Moldova	Cyprus, Bulgaria, Qatar, Chile, Uruguay, Malaysia
414	Qatar	Bulgaria, Moldova, Chile
412	Chile	Bulgaria, Moldova, Qatar, Uruguay, Malaysia
409	Uruguay	Moldova, Chile, Malaysia, Montenegro

Countries and economies are ranked in descending order of math averages.

Source: OECD, PISA 2022 database, Table I.B1.2.1.

I.2.1- Table. Comparison of indicators of countries and economies in mathematics [2/2]

Statistically significantly higher than the OECD average

Statistically, it does not significantly differ from the OECD average

Statistically significantly lower than the OECD average

Average score	Comparable country/economy	Countries and economies whose average scores are statistically not significantly different from the scores of the comparison countries/economies
409	Malaysia	Moldova, Chile, Uruguay, Montenegro
406	Montenegro	Uruguay, Malaysia
397	Baku (Azerbaijan)	Mexico, Thailand, Peru
395	Mexico	Baku (Azerbaijan), Thailand, Peru, Georgia
394	Thailand	Baku (Azerbaijan), Mexico, Peru, Georgia, Saudi Arabia, North

		Macedonia
391	Peru	Baku (Azerbaijan), Mexico, Thailand, Georgia, Saudi Arabia, North Macedonia
390	Georgia	Mexico, Thailand, Peru, Saudi Arabia, North Macedonia, Costa Rica, Colombia
389	Saudi Arabia	Thailand, Peru, Georgia, North Macedonia, Costa Rica, Colombia
389	North Macedonia	Thailand, Peru, Georgia, Saudi Arabia, Costa Rica, Colombia
385	Costa Rica	Georgia, Saudi Arabia, North Macedonia, Colombia, Jamaica*
383	Colombia	Georgia, Saudi Arabia, North Macedonia, Costa Rica, Brazil, Argentina, Jamaica*
379	Brazil	Colombia, Argentina, Jamaica*
378	Argentina	Colombia, Brazil, Jamaica*
377	Jamaica*	Costa Rica, Colombia, Brazil, Argentina
368	Albania	Palestine, Indonesia, Morocco, Uzbekistan
366	Palestinian Authority	Albania, Indonesia, Morocco, Uzbekistan, Jordan
366	Indonesia	Albania, Palestinian Authority, Morocco, Uzbekistan, Jordan
365	Morocco	Albania, Palestinian Authority, Indonesia, Uzbekistan, Jordan, Panama*
364	Uzbekistan	Albania, Palestinian Authority, Indonesia, Morocco, Jordan
361	Jordan	Palestine, Indonesia, Morocco, Uzbekistan, Panama*
357	Panama*	Morocco, Jordan, Kosovo, Philippines
355	Kosovo	Panama*, Philippines
355	Philippines	Panama*, Kosovo
344	Guatemala	El Salvador, Dominican Republic
343	Salvador	Guatemala, Dominican Republic
339	Dominican Republic	Guatemala, El Salvador, Paraguay, Cambodia
338	Paraguay	Dominican Republic, Cambodia
336	Cambodia	Dominican Republic, Paraguay

Countries and economies are ranked in descending order of math averages.

Source: OECD, PISA 2022 database, Table I.B1.2.1.

Table I.2.2. Comparing countries and economies in reading [1/2]

Statistically significantly higher than the OECD average

Statistically, it does not significantly differ from the OECD average

Statistically significantly lower than the OECD average

Average score	Comparable country/economy	Countries and economies whose average is not statistically significantly different from the comparison country/economy score
543	Singapore	
516	Ireland*	Japan, Korea, Chinese Taipei, Estonia
516	Japan	Ireland*, Korea, Chinese Taipei, Estonia, Macau (China)

515	Korea	Ireland*, Japan, Chinese Taipei, Estonia, Macau (China)
515	Chinese Taipei	Ireland*, Japan, Korea, Estonia, Macau (China)
511	Estonia	Ireland*, Japan, Korea, Chinese Taipei, Macau (China), Canada*, USA*
510	Macau (China)	Japan, Korea, Chinese Taipei, Estonia, Canada*, USA*
507	Canada*	Estonia, Macau (China), USA*
504	United States*	Estonia, Macau (China), Canada*, New Zealand*, Hong Kong (China)*, Australia*, United Kingdom*
501	New Zealand*	USA*, Hong Kong (China)*, Australia*
500	Hong Kong (China)*	USA*, New Zealand*, Australia*, UK*
498	Australia*	USA*, New Zealand*, Hong Kong (China)*, United Kingdom*
494	United Kingdom*	USA*, Hong Kong (China)*, Australia*, Finland, Denmark*, Poland, Czech Republic
490	Finland	United Kingdom*, Denmark*, Poland, Czech Republic, Sweden
489	Denmark*	United Kingdom*, Finland, Poland, Czech Republic, Sweden, Switzerland, Italy
489	Poland	United Kingdom*, Finland, Denmark*, Czech Republic, Sweden, Switzerland, Italy
489	Czech Republic	United Kingdom*, Finland, Denmark*, Poland, Sweden, Switzerland
487	Sweden	Finland, Denmark*, Poland, Czech Republic, Switzerland, Italy, Austria, Germany
483	Switzerland	Denmark*, Poland, Czech Republic, Sweden, Italy, Austria, Germany, Belgium, Portugal
482	Italy	Denmark*, Poland, Sweden, Switzerland, Austria, Germany, Belgium, Portugal, Norway, Croatia, Latvia*, France, Israel
480	Austria	Sweden, Switzerland, Italy, Germany, Belgium, Portugal, Norway, Croatia, Latvia*, Spain, France, Israel, Hungary
480	Germany	Sweden, Switzerland, Italy, Austria, Belgium, Portugal, Norway, Croatia, Latvia*, Spain, France, Israel, Hungary and Lithuania
479	Belgium	Switzerland, Italy, Austria, Germany, Portugal, Norway, Croatia, Latvia*, Spain, France, Israel, Hungary
477	Portugal	Switzerland, Italy, Austria, Germany, Belgium, Norway, Croatia, Latvia*, Spain, France, Israel, Hungary, Lithuania
477	Norway	Italy, Austria, Germany, Belgium, Portugal, Croatia, Latvia*, Spain, France, Israel, Hungary and Lithuania
475	Croatia	Italy, Austria, Germany, Belgium, Portugal, Norway, Latvia*, Spain, France, Israel, Hungary, Lithuania
475	Latvia*	Italy, Austria, Germany, Belgium, Portugal, Norway, Croatia, Spain, France, Israel, Hungary, Lithuania

474	Spain	Austria, Germany, Belgium, Portugal, Norway, Croatia, Latvia*, France, Israel, Hungary, Lithuania
474	France	Italy, Austria, Germany, Belgium, Portugal, Norway, Croatia, Latvia*, Spain, Israel, Hungary, Lithuania, Slovenia
474	Israel	Italy, Austria, Germany, Belgium, Portugal, Norway, Croatia, Latvia*, Spain, France, Hungary, Lithuania, Slovenia
473	Hungary	Austria, Germany, Belgium, Portugal, Norway, Croatia, Latvia*, Spain, France, Israel, Lithuania, Slovenia
472	Lithuania	Germany, Portugal, Norway, Croatia, Latvia*, Spain, France, Israel, Hungary, Slovenia
469	Slovenia	France, Israel, Hungary, Lithuania, Vietnam**
462	Vietnam**	Slovenia, Netherlands*, Turkey
459	Netherlands*	Vietnam**, Turkey
456	Turkey	Vietnam**, Netherlands*
448	Chile	Slovak Republic, Malta
447	Slovak Republic	Chile, Malta, Serbia
445	Malta	Chile, Slovak Republic, Serbia
440	Serbia	Slovak Republic, Malta, Greece, Iceland
438	Greece	Serbia, Iceland
436	Iceland	Territories of Serbia, Greece, Uruguay, Romania, Ukraine (18 out of 27)
430	Uruguay	Territories of Iceland, Brunei Darussalam, Romania, Ukraine (18 out of 27)
429	Brunei Darussalam	Uruguay, Romania, Ukraine regions (18 out of 27)
428	Romania	Territories of Iceland, Uruguay, Brunei Darussalam, Ukraine (18 out of 27)
428	Ukrainian regions (18 out of 27)	Iceland, Uruguay, Brunei Darussalam, Romania
419	Qatar	United Arab Emirates, Mexico, Costa Rica
417	United Arab Emirates	Qatar, Mexico, Costa Rica, Jamaica*
415	Mexico	Qatar, United Arab Emirates, Costa Rica, Moldova, Brazil, Jamaica*, Colombia, Peru
415	Costa Rica	Qatar, United Arab Emirates, Mexico, Moldova, Brazil, Jamaica*, Colombia, Peru
411	Moldova	Mexico, Costa Rica, Brazil, Jamaica*, Colombia, Peru, Bulgaria
410	Brazil	Mexico, Costa Rica, Moldova, Jamaica*, Colombia, Peru, Bulgaria

** Caution is required when comparing estimates based on PISA 2022 with other countries/economies, as strong links to the international PISA reading scale have not been

established (see Student Guide and Appendix A4). Countries and economies are ranked in descending order of average reading scores. Source: OECD, PISA 2022 database, table I. B1.2.2.

Table I.2.2. Comparing countries and economies in reading [2.2]

Statistically significantly higher than the OECD average
Statistically, it does not significantly differ from the OECD average
Statistically significantly lower than the OECD average

** Caution is required when comparing estimates based on PISA 2022 with other countries/economies, as strong links to the international PISA reading scale have not been established (see Student Guide and Appendix A4). Countries and economies are ranked in

410	Jamaica*	United Arab Emirates, Mexico, Costa Rica, Moldova, Brazil, Colombia, Peru, Montenegro, Bulgaria, Argentina
409	Colombia	Mexico, Costa Rica, Moldova, Brazil, Jamaica*, Peru, Montenegro, Bulgaria, Argentina
408	Peru	Mexico, Costa Rica, Moldova, Brazil, Jamaica*, Colombia, Montenegro, Bulgaria
405	Montenegro	Jamaica*, Colombia, Peru, Bulgaria, Argentina
404	Bulgaria	Moldova, Brazil, Jamaica*, Colombia, Peru, Montenegro, Argentina
401	Argentina	Jamaica*, Colombia, Montenegro, Bulgaria
392	Panama*	Malaysia, Kazakhstan
388	Malaysia	Panama*, Kazakhstan, Saudi Arabia
386	Kazakhstan	Panama*, Malaysia, Saudi Arabia
383	Saudi Arabia	Malaysia, Kazakhstan, Cyprus, Thailand, Mongolia
381	Cyprus	Saudi Arabia, Thailand, Mongolia
379	Thailand	Saudi Arabia, Cyprus, Mongolia, Guatemala, Georgia, Paraguay
378	Mongolia	Saudi Arabia, Cyprus, Thailand, Guatemala, Georgia, Paraguay
374	Guatemala	Thailand, Mongolia, Georgia, Paraguay
374	Georgia	Thailand, Mongolia, Guatemala, Paraguay
373	Paraguay	Thailand, Mongolia, Guatemala, Georgia
365	Baku (Azerbaijan)	El Salvador, Indonesia
365	El Salvador	Baku (Azerbaijan), Indonesia, Albania
359	Indonesia	Baku (Azerbaijan), El Salvador, North Macedonia, Albania, Dominican Republic
359	North Macedonia	Indonesia, Albania
358	Albania	El Salvador, Indonesia, North Macedonia
351	Dominican Republic	Indonesia, Palestinian Authority, Philippines
349	Palestinian Authority	Dominican Republic, Philippines
347	Philippines	Dominican Republic, Palestinian Authority, Kosovo, Jordan, Morocco
342	Kosovo	Philippines, Jordan, Morocco
342	Jordan	Philippines, Kosovo, Morocco
339	Morocco	Philippines, Kosovo, Jordan, Uzbekistan
336	Uzbekistan	Morocco
329	Cambodia	

descending order of average reading scores. Source: OECD, PISA 2022 database, table I. B1.2.2.

Table I.2.3. Comparing countries and economies in science [1/2]

Statistically higher than the OECD average
Statistically significantly above the OECD average
Statistically, it is much lower than the OECD average

Average score	Comparable country/economy	Countries and economies whose average is not statistically significantly different from the comparison country/economy score
561	Singapore	
547	Japan	Macau (China)
543	Macau (China)	Japan, Chinese Taipei
537	Chinese Taipei	Macau (China), Korea
528	Korea	Chinese Taipei, Estonia, Hong Kong (China)*
526	Estonia	Korea, Hong Kong (China)*
520	Hong Kong (China)*	Korea, Estonia, Canada*
515	Canada*	Hong Kong (China)*, Finland
511	Finland	Canada*, Australia*
507	Australia*	Finland, New Zealand*, Ireland*, Switzerland, USA*
504	New Zealand*	Australia*, Ireland*, Switzerland, Slovenia, Great Britain*, USA*, Poland
504	Ireland*	Australia*, New Zealand*, Switzerland, Slovenia, Great Britain*, USA*, Poland, Czech Republic
503	Switzerland	Australia*, New Zealand*, Ireland*, Slovenia, United Kingdom*, USA*, Poland, Czech Republic
500	Slovenia	New Zealand*, Ireland*, Switzerland, United Kingdom*, USA*, Poland, Czech Republic
500	United Kingdom*	New Zealand*, Ireland*, Switzerland, Slovenia, USA*, Poland, Czech Republic, Latvia*, Denmark*, Sweden, Germany
499	United States*	Australia*, New Zealand*, Ireland*, Switzerland, Slovenia, United Kingdom*, Poland, Czech Republic, Latvia*, Denmark*, Sweden, Germany, Austria, Belgium, Netherlands*
499	Poland	New Zealand*, Ireland*, Switzerland, Slovenia, United Kingdom*, USA*, Czech Republic, Latvia*, Denmark*, Sweden, Germany
498	Czech Republic	Ireland*, Switzerland, Slovenia, Great Britain*, USA*, Poland, Latvia*, Denmark*, Sweden, Germany and Austria
494	Latvia*	UK*, USA*, Poland, Czech Republic, Denmark*, Sweden, Germany, Austria, Belgium, Netherlands*, France
494	Denmark*	UK*, USA*, Poland, Czech Republic, Latvia*, Sweden, Germany, Austria, Belgium, Netherlands*, France
494	Sweden	UK*, USA*, Poland, Czech Republic, Latvia*,

		Denmark*, Germany, Austria, Belgium, Netherlands*, France
492	Germany	UK*, USA*, Poland, Czech Republic, Latvia*, Denmark*, Sweden, Austria, Belgium, Netherlands*, France, Hungary, Lithuania, Portugal
491	Austria	USA*, Czech Republic, Latvia*, Denmark*, Sweden, Germany, Belgium, Netherlands*, France, Hungary, Lithuania, Portugal
491	Belgium	USA*, Latvia*, Denmark*, Sweden, Germany, Austria, Netherlands*, France, Hungary, Lithuania, Portugal
488	Netherlands*	USA*, Latvia*, Denmark*, Sweden, Germany, Austria, Belgium, France, Hungary, Spain, Lithuania, Portugal, Croatia
487	France	Latvia*, Denmark*, Sweden, Germany, Austria, Belgium, Netherlands*, Hungary, Spain, Lithuania, Portugal, Croatia
486	Hungary	Germany, Austria, Belgium, Netherlands*, France, Spain, Lithuania, Portugal, Croatia
485	Spain	Netherlands*, France, Hungary, Lithuania, Portugal, Croatia
484	Lithuania	Germany, Austria, Belgium, Netherlands*, France, Hungary, Spain, Portugal, Croatia, Norway, Italy
484	Portugal	Germany, Austria, Belgium, Netherlands*, France, Hungary, Spain, Lithuania, Croatia, Norway, Italy
483	Croatia	Netherlands*, France, Hungary, Spain, Lithuania, Portugal, Norway, Italy
478	Norway	Lithuania, Portugal, Croatia, Italy, Turkey, Vietnam
477	Italy	Lithuania, Portugal, Croatia, Norway, Turkey, Vietnam
476	Turkey	Norway, Italy, Vietnam
472	Vietnam	Norway, Italy, Turkey, Malta, Israel
466	Malta	Vietnam, Israel, Slovak Republic
465	Israel	Vietnam, Malta, Slovak Republic
462	Slovak Republic	Malta, Israel
450	Ukrainian regions (18 out of 27)	Serbia, Iceland, Brunei Darussalam, Chile
447	Serbia	Ukrainian territories (18 out of 27), Iceland, Brunei Darussalam, Chile, Greece
447	Iceland	Ukrainian territories (18 out of 27), Serbia, Brunei Darussalam, Chile, Greece
446	Brunei Darussalam	Ukrainian regions (18 out of 27), Serbia, Iceland, Chile, Greece
444	Chile	Territories of Ukraine (18 out of 27), Serbia, Iceland, Brunei Darussalam, Greece

441	Greece	Serbia, Iceland, Brunei Darussalam, Chile, Uruguay
435	Uruguay	Greece, Qatar, United Arab Emirates, Romania
432	Qatar	Uruguay, United Arab Emirates, Romania
432	United Arab Emirates	Uruguay, Qatar, Romania
428	Romania	Uruguay, Qatar, United Arab Emirates, Kazakhstan, Bulgaria
423	Kazakhstan	Romania, Bulgaria
421	Bulgaria	Romania, Kazakhstan, Moldova, Malaysia
417	Moldova	Bulgaria, Malaysia, Mongolia, Colombia, Costa Rica
416	Malaysia	Bulgaria, Moldova, Mongolia, Colombia, Costa Rica, Cyprus, Mexico, Thailand

Countries and economies are ranked in descending order of science averages. Source: OECD, PISA 2022 database, Table I.B1.2.3.

Table I.2.3. Comparing countries and economies in science [2/2]

Statistically higher than the OECD average

Not statistically significantly different from the OECD average

Statistically, it is much lower than the OECD average

Average score	Comparable country/economy	Countries and economies whose average is not statistically significantly different from the comparison country/economy score
412	Mongolia	Moldova, Malayziya, Kolumbiya, Kosta-Rika, Cyprus, Meksika, Thailand, Peru, Argentina
411	Colombia	Moldova, Malayziya, Mo'g'uliston, Kosta-Rika, Kipr, Meksika, Thailand, Peru, Argentina, Yamayka*
411	Costa Rica	Moldova, Malayziya, Mo'g'uliston, Kolumbiya, Kipr, Meksika, Thailand, Peru, Argentina, Yamayka*
411	Cyprus	Malayziya, Mo'g'uliston, Kolumbiya, Kosta-Rika, Meksika, Thailand, Peru, Argentina, Yamayka*
410	Mexico	Malayziya, Mo'g'uliston, Kolumbiya, Kosta-Rika, Cypr, Thailand, Peru, Argentina, Yamayka*
409	Thailand	Malayziya, Mo'g'uliston, Kolumbiya, Kosta-Rika, Kipr, Meksika, Peru, Argentina, Braziliya, Yamayka*
408	Peru	Mo'g'uliston, Kolumbiya, Kosta-Rika, Cyprus, Meksika, Thailand, Argentina, Chernogoriya, Braziliya, Yamayka*
406	Argentina	Mo'g'uliston, Kolumbiya, Kosta-Rika, Cyprus, Meksika, Thailand, Peru, Chernogoriya, Braziliya, Yamayka*
403	Montenegro	Peru, Argentina, Brazil, Yamayka*
403	Brazil	Thailand, Peru, Argentina, Chernogoriya, Yamayka*
403	Jamaica*	Kolumbiya, Kosta-Rika, Cyprus, Meksika, Thailand, Peru, Argentina, Chernogoriya, Braziliya
390	Saudi Arabia	Panama*
388	Panama*	Saudiya Arabistoni, Gruziya, Indonesia, Boku (Ozarbayjon)
384	Georgia	Panama*, Indonesia, Boku (Ozarbayjon), Shimoliy Makedoniya
383	Indonesia	Panama*, Gruziya, Boku (Ozarbayjon), Shimoliy Makedoniya

380	Baku (Azerbaijan)	Panama*, Gruziya, Indonesia, Shimoliy Makedoniya, Albaniya, Jordaniya
380	North Macedonia	Gruziya, Indonesia, Boku (Ozarbayjon), Albaniya
376	Albania	Boku (Ozarbayjon), Shimoliy Makedoniya, Jordaniya, Salvador, Guatemala
375	Jordan	Boku (Ozarbayjon), Albaniya, Salvador, Guatemala, Falastin ma'muriyati
373	El Salvador	Albaniya, Jordan, Guatemala, Falastin ma'muriyati, Paragvay, Marokash
373	Guatemala	Albaniya, Jordaniya, Salvador, Falastin ma'muriyati, Paraguay, Marokash
369	Palestinian Authority	Jordaniya, Salvador, Guatemala, Paraguay, Marokash
368	Paraguay	Salvador, Guatemala, Falastin ma'muriyati, Marokash
365	Morocco	Salvador, Guatemala, Falastin ma'muriyati, Paragvay, Dominikan Respublikasi
360	Dominican Republic	Marokash, Kosovo, Philippines, O'zbekiston
357	Kosovo	Dominikan Respublikasi, Philippines, O'zbekiston
356	Philippines	Dominikan Respublikasi, Kosovo, O'zbekiston
355	Uzbekistan	Dominikan Respublikasi, Kosovo, Philippines
347	Cambodia	

Countries and economies are ranked in descending order of science averages.
Source: OECD, PISA 2022 database, Table I.B1.2.3.

REFERENCES

1. Oʻzbekiston Respublikasi Prezidentining 2019 yil 29 apreldagi "Xalq ta'limi tizimini 2030 yilgacha rivojlantirish konsepsiyasini tasdiqlash toʻgʻrisida" PF-5712-sonli farmonida xalqaro PISA tadqiqotiga oid vazifalar.
2. OECD (2023), PISA 2022 Results (Volume I): The State of Learning and Equity in Education, PISA, OECD Publishing, Paris, https://doi.org/10.1787/53f23881-en
3. Executive Summary p. 26-35, Key features of PISA 2022 p. 40-41, Howw did countries perform in PISA?, p.49-57.