

High-Performing Students: Percentage of U.S. Students at the Highest Levels of Performance Relative to International Peers on the Most Recent International Assessments in Reading, Mathematics, and Science: Results from PIRLS 2011, TIMSS 2011, and PISA 2012

How does the United States compare with other nations in terms of the proportion of students performing at the highest levels of performance? The international assessments Progress in International Reading Literacy Study (PIRLS), Trends in International Mathematics and Science Study (TIMSS), and Program for International Student Assessment (PISA) report the percentage of students in each participating nation and sub-national or non-national education system performing at each of several levels of performance. The most recent U.S. results on international assessments are from PIRLS 2011, TIMSS 2011, and PISA 2012, and together cover reading, mathematics, and science.

NCES used the International Data Explorer to compare the percentages of high-performing students in the United States and other participating education systems (hereafter, "education systems" refers to countries and sub-national or non-national education systems) in reading, mathematics, and science at grades 4 and 8 and age 15. High-performing students at grades 4 and 8 are defined as those reaching the Advanced International Benchmark on the PIRLS (reading) or TIMSS (mathematics and science) assessments. At age 15, high performance is defined as reaching at or above PISA Proficiency Level 5. Readers should be aware that, as shown and discussed in this report, education systems are placed into brackets of percentages based on point estimates (and thus not accounting for the error surrounding these estimates). For example, some education systems in the '0.5 to 5.0' and 'greater than 5.0 to 10.0' percent brackets may not differ statistically from each other even though they are in separate brackets. For more information about how high-performing students are defined in each international assessment, see About This Analysis.

Results:

At grade 4, the percentage of high-performing students in the United States was 17 percent in reading, 13 percent in mathematics, and 15 percent in science.

- > Florida, which participated as part of the U.S. sample as well as to obtain its own results, had 22 percent of fourth-grade students at the high-performing level in reading and 14 percent in both mathematics and science.
- > Singapore (24 percent) was the only system besides Florida to perform above the 20 percent line in reading at grade 4. In mathematics and science, 43 percent and 33 percent of 4th-graders in Singapore were high performers, respectively.
- > Education systems performing above the 20 percent line in at least one subject included Singapore and Florida in reading; Singapore, the Republic of Korea, Hong Kong-China, Chinese Taipei, Japan, and Northern Ireland-United Kingdom in mathematics; and Singapore, the Republic of Korea, and Finland in science.

At grade 8, the percentage of high-performing students in the United States was 7 percent in mathematics and 10 percent in science—the only two subjects assessed at grade 8.

- > Among the nine U.S. states that participated as part of the U.S. sample as well as to obtain their own results, Massachusetts had a relatively high percentage of high performers in mathematics (19 percent) and the highest percentage in science (24 percent). In science, Massachusetts was second only to Singapore (40 percent) in percentage of high performers.
- > Approximately half of the students in Chinese Taipei (49 percent), Singapore (48 percent), and the Republic of Korea (47 percent) reached the highest level in grade 8 mathematics.

At age 15, the percentage of high-performing students in the United States was 8 percent in reading, 9 percent in mathematics and 7 percent in science.

- > In Shanghai-China, 55 percent of 15-year-olds performed at the highest level in mathematics. Singapore, the next highest performing system, had 40 percent high performers.
- > In science at age 15, Shanghai-China (27 percent) was the only system performing above the 25 percent line.



About the NCES International Data Explorer

This analysis was produced using the NCES International Data Explorer, a web-based data tool that allows users to quickly and easily produce tables, charts, and maps comparing the performance and educational contexts of students in the United States and nations (and sub-national or non-national education systems) around the world. The International Data Explorer is available at: <http://nces.ed.gov/surveys/international/IDE>.

About This Analysis

This analysis compares participating education systems (in most cases nations, but in some cases sub-national or non-national entities) with the international average in terms of the percentage of students scoring at the highest levels of performance on PIRLS, TIMSS, and PISA.

> For reading at grade 4 and mathematics and science at grades 4 and 8, the highest level of performance is defined as those reaching the PIRLS or TIMSS Advanced International Benchmark (a score of 625 where the mean is 500 and standard deviation (s.d.) is 100). For reading at grade 4, the international average is the PIRLS Scale Average, set originally as the mean score of the participating countries in the first round of PIRLS (2001). Successive PIRLS assessments since then have scaled the achievement data so that scores are equivalent from assessment to assessment. For mathematics and science at grades 4 and 8, the international average is the TIMSS Scale Average, set originally as the mean score of participating countries in the first round of TIMSS (1995). Successive TIMSS assessments since then have scaled the achievement data so that scores are equivalent from assessment to assessment.

> For reading, mathematics, and science at age 15, the highest level of performance is defined as those reaching at or above PISA Proficiency Level 5 (in reading, the threshold score is 626, where the mean is 496 and s.d. is 94; in mathematics, the threshold score is 607, where the mean is 494 and s.d. is 92; and in science, the threshold score is 633, where the mean is 501 and s.d. is 93). For mathematics, reading, and science literacy at age 15, the international average is the PISA 2012 mean score of the OECD (Organization for Economic Cooperation and Development) countries, which is a group of 34 industrialized countries.

Information about the knowledge and skills associated with the PIRLS, TIMSS, and PISA performance levels can be found in the descriptions of the [PIRLS International Benchmarks](#) (reading grade 4 on page 11), the [TIMSS International Benchmarks](#) (mathematics grades 4 and 8 on page 19; science grades 4 and 8 on page 51), and the [PISA Proficiency Levels](#) (reading at age 15 on page 6, mathematics at age 15 on page 3, and science at age 15 on page 4).

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About the Data Sources

The Progress in International Reading Literacy Study (PIRLS) is an international comparative study of the reading literacy of fourth-grade students. The most recent PIRLS data are from 2011, when 53 education systems (including 8 benchmarking education systems) participated. For more information on PIRLS, please visit: <http://nces.ed.gov/surveys/PIRLS>.

The Trends in International Mathematics and Science Study (TIMSS) is an international comparative study of the mathematics and science achievement of fourth- and eighth-grade students. The most recent TIMSS data are from 2011, when 57 education systems (including 7 benchmarking education systems) participated at grade 4 and 56 education systems (including 14 benchmarking education systems) participated at grade 8. For more information on TIMSS, please visit: <http://nces.ed.gov/TIMSS>.

The Program for International Student Assessment (PISA) is an international comparative study of the capabilities of 15-year-old students in reading, mathematics, and science literacy. The most recent PISA data are from 2012, when 65 education systems participated. For more information on PISA, please visit: <http://nces.ed.gov/surveys/PISA>.

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READING		
Percent of high-performing students	Grade 4 (PIRLS 2011)	Age 15 (PISA 2012)
	Greater than 50.0	
Greater than 45.0 to 50.0		
Greater than 40.0 to 45.0		
Greater than 35.0 to 40.0		
Greater than 30.0 to 35.0		
Greater than 25.0 to 30.0		
Greater than 20.0 to 25.0	Singapore (24) FL-USA (22)	Shanghai-Ch (25) Singapore (21)
Greater than 15.0 to 20.0	Russian Fed., Northern Ireland-UK (19) Finland, England-UK, Hong Kong-Ch. (18) USA (17) Ireland (16) Ontario-Ca., Israel (15)	Japan (18) Hong Kong-Ch (17) MA-USA (16)
Greater than 10.0 to 15.0	New Zealand (14) Alberta-Ca., Canada, Ch. Taipei (13) Denmark, Hungary (12) Bulgaria, Croatia (11)	CT-USA (15) Rep. of Korea, New Zealand (14) Finland, France, Canada (13) Ch. Taipei, Belgium, Australia (12) Ireland, Liechtenstein (11), Norway (10)
Greater than 5.0 to 10.0	Australia, Italy, Germany (10), Portugal, Sweden, Int'l Avg. (9) Czech Rep., Slovak Rep., Slovenia (8) Poland, Quebec-Ca., Romania, Netherlands (7) Dubai-UAE, Lithuania (6)	Poland, Netherlands, Israel (10) Switzerland, Germany, Luxembourg, United Kingdom (9) OECD Avg., Estonia, USA, Sweden (8) Macao-Ch, Italy (7), Czech Rep., Iceland, Portugal, Hungary, Spain, Austria, FL-USA (6) , Denmark, Greece (5)
0.5 to 5.0	France, Austria (5) Malta, Andalusia-Sp., Spain (4) Trinidad and Tobago, United Arab Emirates (3) Georgia, Belgium-Fr., Qatar, Norway, Abu Dhabi-UAE (2) Maltese-Ma., Islamic Rep. of Iran, Colombia, Saudi Arabia (1)	Slovenia, Russian Fed., Vietnam (5) Croatia, Slovak Rep., Turkey, Bulgaria, Latvia, Cyprus (4), Lithuania (3) Rep. of Serbia, United Arab Emirates, Qatar, Romania (2) Albania, Rep. of Montenegro, Uruguay, Thailand, Chile, Costa Rica, Argentina, Brazil (1)
Rounds to zero	Oman, Morocco, Indonesia, Azerbaijan	Mexico, Colombia, Indonesia, Jordan, Kazakhstan, Malaysia, Peru, Tunisia

■ = Below the Int'l Avg./OECD Avg. □ = Not measurably different from the Int'l Avg./OECD Avg. ■ = Above the Int'l Avg./OECD Avg.

NOTE: Education systems are listed by the percentage of students performing at the highest levels of performance (percentages in parentheses): at or above the *PIRLS Advanced International Benchmark* (625) for grade 4 and *PISA Proficiency Level 5* (626) for age 15. Education systems within the same percentage categories are ordered according to their unrounded value. Statistical significance (compared to the Int'l Avg./OECD Avg.) based on unrounded estimates. Percent of high-performing students for the International (Int'l)/OECD average scores and United States are presented in bold font. While the formulation and construction of assessment scales are the same across TIMSS, PIRLS, and PISA, the content represented by the scale scores and levels of performance are not the same across different grades/ages within a subject domain. Abbreviations are used for the following US states: Connecticut (CT), Florida (FL), and Massachusetts (MA).

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Progress in International Reading Literacy Study (PIRLS) 2011; Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA) 2012.

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MATHEMATICS

Percent of high-performing students	MATHEMATICS		
	Grade 4 (TIMSS 2011)	Grade 8 (TIMSS 2011)	Age 15 (PISA 2012)
Greater than 50.0			Shanghai-Ch. (55)
Greater than 45.0 to 50.0		Ch. Taipei (49) Singapore (48) Rep. of Korea (47)	
Greater than 40.0 to 45.0	Singapore (43)		
Greater than 35.0 to 40.0	Rep. of Korea (39) Hong Kong-Ch. (37)		Singapore (40) Ch. Taipei (37)
Greater than 30.0 to 35.0	Ch. Taipei (34)	Hong Kong-Ch. (34)	Hong Kong-Ch. (34) Rep. of Korea (31)
Greater than 25.0 to 30.0	Japan (30)	Japan (27)	
Greater than 20.0 to 25.0	Northern Ireland-UK (24)		Liechtenstein (25) Macao-Ch., Japan (24) Switzerland (21)
Greater than 15.0 to 20.0	England-UK (18) NC-USA (16)	MA-USA (19)	Belgium (20), Netherlands, MA-USA (19) Germany, Poland (17) CT-USA, Canada (16) Finland (15)
Greater than 10.0 to 15.0	FL-USA (14) Russian Fed., USA (13) Finland (12) Lithuania, Belgium-FI. (10)	Russian Fed., NC-USA (14) MN-USA (13) Turkey, IN-USA, USA (7) Israel (12) CT-USA (10)	New Zealand, Australia, Estonia (15) Austria, Slovenia (14) Vietnam, France, Czech Republic, OECD Avg. (13) United Kingdom (12), Luxembourg, Iceland, Slovak Rep., Ireland, Portugal (11)
Greater than 5.0 to 10.0	Australia, Denmark, Hungary (10) Rep. of Serbia, Ireland (9) Int'l Avg. , Portugal (8), Kazakhstan, Ontario-Ca., Romania (7), Quebec-Ca. (6) Slovak Rep., Germany (5)	Australia (9) England-UK, FL-USA, Int'l Avg., CO-USA, Hungary (8) Turkey, IN-USA, USA (7) Quebec-Ca. (6), Romania (5)	Denmark, Italy (10) Norway, Israel, Hungary, USA (9) Lithuania, Sweden, Spain, Latvia, Russian Fed. (8) Croatia (7) Turkey, FL-USA (6)
0.5 to 5.0	Azerbaijan, Dubai-UAE, Italy, Netherlands (5) Czech Rep, Turkey, Slovenia, New Zealand, Malta (4) Sweden, Alberta-Ca. (3), Austria, Norway, United Arab Emirates, Armenia, Qatar, Georgia, Chile, Saudi Arabia, Poland, Croatia (2), Bahrain, Spain, Thailand, Abu Dhabi-UAE, Islamic Rep. of Iran, Oman (1)	Lithuania, New Zealand, Dubai-UAE, CA-USA, Ukraine (5) Ontario-Ca., Slovenia, Finland (4) Italy, Armenia, Kazakhstan, Rep. of Macedonia, Georgia, Alberta-Ca. (3), United Arab Emirates, Qatar, AL-USA, Islamic Rep. of Iran, Abu Dhabi-UAE, Malaysia, Thailand (2) Bahrain, Sweden, Palestinian Nat'l Auth., Lebanon, Norway, Saudi Arabia, Chile (1)	Rep. of Serbia (5) Bulgaria, Greece, Cyprus (4) United Arab Emirates, Romania, Thailand (3) Qatar, Chile (2) Uruguay, Malaysia, Rep. of Montenegro, Kazakhstan, Albania, Tunisia, Brazil, Mexico, Peru, Costa Rica, Jordan (1)
Rounds to zero	Yemen, Tunisia, Morocco, Kuwait	Ghana, Indonesia, Jordan, Morocco, Oman, Syrian Arab Rep., Tunisia	Argentina, Colombia, Indonesia

■ = Below the Int'l Avg./OECD Avg. □ = Not measurably different from the Int'l Avg./OECD Avg. ■ = Above the Int'l Avg./OECD Avg.

NOTE: Education systems are listed by the percentage of students performing at the highest levels of performance (percentages in parentheses): at or above the *TIMSS Advanced International Benchmark* (625) for grades 4 or 8 and *PISA Proficiency Level 5* (607) for age 15. Education systems within the same percentage categories are ordered according to their unrounded value. Statistical significance (compared to the Int'l Avg./OECD Avg.) based on unrounded estimates. Percent of high-performing students for the International (Int'l)/OECD average scores and United States are presented in bold font. While the formulation and construction of assessment scales are the same across TIMSS, PIRLS, and PISA, the content represented by the scale scores and levels of performance are not the same across different grades/ages within a subject domain. Abbreviations are used for the following US states: Alabama (AL), California (CA), Colorado (CO), Connecticut (CT), Florida (FL), Indiana (IN), Massachusetts (MA), Minnesota (MN), and North Carolina (NC).

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS) 2011; Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA) 2012.

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SCIENCE			
Percent of high-performing students	Grade 4 (TIMSS 2011)	Grade 8 (TIMSS 2011)	Age 15 (PISA 2012)
Greater than 50.0			
Greater than 45.0 to 50.0			
Greater than 40.0 to 45.0			
Greater than 35.0 to 40.0		Singapore (40)	
Greater than 30.0 to 35.0	Singapore (33)		
Greater than 25.0 to 30.0	Rep. of Korea (29)		Shanghai-Ch (27)
Greater than 20.0 to 25.0	Finland (20)	MA-USA, Ch. Taipei (24) Rep. of Korea (20)	Singapore (23)
Greater than 15.0 to 20.0	Russian Fed. (16) Ch. Taipei (15)	Japan (18) MN-USA (16)	Japan (18) Finland, Hong Kong-Ch. (17)
Greater than 10.0 to 15.0	USA (15), Japan, FL-USA (14) Hungary (13) NC-USA (12) Romania, England-UK, Alberta-Ca. (11)	CO-USA, CT-USA, Russian Fed., England-UK (14) Slovenia, FL-USA, Finland (13) NC-USA, Alberta-Ca. (12) Israel, Australia (11) IN-USA (10)	MA-USA, Australia (14) New Zealand, CT-USA, Estonia (13) Germany, Netherlands, Rep. of Korea (12) Canada, United Kingdom, Poland, Ireland (11) Liechtenstein (10)
Greater than 5.0 to 10.0	Sweden, Czech Rep., Slovak Rep. (10) Ontario-Ca., Hong Kong-Ch. (9) Austria, Denmark, Rep. of Serbia, Italy (8) Australia, Portugal, Germany, Int'l Avg., Kazakhstan, Ireland, Slovenia (7) Dubai-UAE (6) Poland, New Zealand (5)	USA (10) Hong Kong-Ch., New Zealand, Hungary (9) Turkey (8) Dubai-UAE, Int'l Avg. (7) Sweden, Lithuania, CA-USA, Ontario-Ca., Ukraine (6) AL-USA (5)	Slovenia (10), Switzerland, Belgium (9), OECD Avg., Ch. Taipei, Luxembourg, Vietnam, France, Austria, Czech Rep., Norway (8) USA, Denmark, Macao-Ch. (7) Sweden, Italy, Hungary, Israel (6) FL-USA, Iceland, Lithuania (5)
0.5 to 5.0	Northern Ireland-UK (5), Spain, Lithuania, Thailand, Bahrain (4), Turkey, Croatia, United Arab Emirates, Quebec-Ca., Netherlands, Islamic Rep. of Iran, Saudi Arabia (3), Chile, Azerbaijan, Qatar, Malta, Abu Dhabi-UAE, Belgium-FI. (2) Georgia, Oman, Norway, Armenia, Kuwait (1)	Quebec-Ca., Islamic Rep. of Iran (5) United Arab Emirates, Italy, Abu Dhabi-UAE, Kazakhstan (4) Bahrain, Qatar, Norway, Romania (3) Jordan, Rep. of Macedonia, Oman (2) Armenia, Malaysia, Thailand, Chile, Palestinian Nat'l Auth., Lebanon, Saudi Arabia (1)	Slovak Rep., Spain, Croatia, Portugal (5) Latvia, Russian Fed. (4) Bulgaria, United Arab Emirates (3) Greece, Cyprus, Turkey, Rep. of Serbia (2) Qatar, Uruguay, Chile, Thailand, Romania (1)
Rounds to zero	Morocco, Tunisia, Yemen	Georgia, Ghana, Indonesia, Morocco, Syrian Arab Rep., Tunisia	Mexico, Albania, Argentina, Brazil, Colombia, Costa Rica, Indonesia, Jordan, Kazakhstan, Malaysia, Rep. of Montenegro, Peru, Tunisia

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NOTE: Education systems are listed by the percentage of students performing at the highest levels of performance (percentages in parentheses): at or above the TIMSS Advanced International Benchmark (625) for grades 4 or 8 and PISA Proficiency Level 5 (633) for age 15. Education systems within the same percentage categories are ordered according to their unrounded value. Statistical significance (compared to the Int'l Avg./OECD Avg.) based on unrounded estimates. Percent of high-performing students for the International (Int'l)/OECD average scores and United States are presented in bold font. While the formulation and construction of assessment scales are the same across TIMSS, PIRLS, and PISA, the content represented by the scale scores and levels of performance are not the same across different grades/ages within a subject domain. Abbreviations are used for the following US states: Alabama (AL), California (CA), Colorado (CO), Connecticut (CT), Florida (FL), Indiana (IN), Massachusetts (MA), Minnesota (MN), and North Carolina (NC).

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