

## Low-Performing Students: Percentage of U.S. Students at the Lowest 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 lowest 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 percentage of low-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. Low-performing students at grades 4 and 8 are defined as those failing to reach the Low International Benchmark on the PIRLS (reading) or TIMSS (mathematics and science) assessments. At age 15, low performance is defined as failing to reach PISA Proficiency Level 2. 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 'Less than 5.0' and '5.0 to less than 10.0' percent brackets may not differ statistically from each other even though they are in separate brackets. For more information about how low-performing students are defined in each international assessment, see About This Analysis.

### Results:

At grade 4, eighteen education systems were below the '5.0 percent' line of low-performing students in all subjects in which they were assessed, including: Andalusia-Spain, Austria, Canada, Chinese Taipei, Denmark, Finland, Flemish Belgium, Florida, France, Germany, Hong Kong-China, Japan, Republic of Korea, Netherlands, Quebec-Canada, Russian Federation, Singapore, and the United States (Flemish Belgium, Japan, and the Republic of Korea did not participate in grade 4 reading, and Andalusia-Spain, Canada, and France did not participate in grade 4 mathematics and science).

> In the United States, 2 percent of fourth-grade students were low-performers in reading, 4 percent in mathematics, and 4 percent in science.

> Four out of the 53 education systems participating in the fourth-grade reading assessment were above the '40 percent or more' line of low-performing students, and 7 out of the 57 education systems participating in the fourth-grade mathematics and science assessments were above this line in both subjects.

At grade 8, nine education systems were below the '5.0 percent' line of low-performing students in both mathematics and science (reading was not assessed internationally at grade 8), including: Chinese Taipei, Finland, Indiana, Japan, Republic of Korea, Massachusetts, Minnesota, Quebec-Canada, and Singapore.

> Approximately, 8 percent of U.S. eighth-graders were low-performing students in mathematics and 7 percent in science.

> Six of the 56 education systems participating in the eighth-grade assessments were above the '40 percent or more' line of low performers in both mathematics and science.

At age 15, Shanghai-China was the only education system below the '5.0 percent' line of low performers in all three subjects, with 3 percent in reading, 4 percent in mathematics, and 3 percent in science.

> About one in five U.S. 15-year-olds was a low-performing student across subjects: 17 percent in reading, 26 percent in mathematics, and 18 percent in science.

> Fourteen of the 65 education systems participating in the assessment of 15-year-olds were above the '40 percent or more' line of low performers in all three subjects and 22 education systems in at least one subject.



### 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 lowest levels of performance on PIRLS, TIMSS, and PISA.

> For reading at grade 4 and mathematics and science at grades 4 and 8, the lowest level of performance is defined as failing to reach the PIRLS or TIMSS Low International Benchmark (a score of 400 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 lowest level of performance is defined as failing to reach PISA Proficiency Level 2 (in reading, the threshold score is 407, where the mean is 496 and the s.d. is 94; in mathematics, the threshold score is 420, where the mean is 494 and the s.d. is 92; and in science, the threshold score is 410, where the mean is 501 and the 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 mathematics, reading, 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 low-performing students	Grade 4 (PIRLS 2011)	Age 15 (PISA 2012)
Less than 5.0	Netherlands (0), Finland, Hong Kong-Ch., Russian Fed., Croatia, Denmark (1), <b>FL-USA</b> , Czech Rep., Quebec-Ca., Ch. Taipei, Canada, Italy, Germany, Portugal, Sweden, <b>USA (2)</b> Ontario-Ca., Austria, Alberta-Ca., Singapore, Northern Ireland, Ireland, Lithuania (3), Slovak Rep. (4) Slovenia, England-UK, France, Andalusia-Sp. (5)	Shanghai-Ch. (3)
5.0 to less than 10.0	Norway, Hungary, Poland (5) Spain, Belgium-Fr. (6) Israel, Bulgaria, Australia (7) New Zealand (8)	Hong Kong-Ch. (7) Rep. of Korea (8) Estonia, Vietnam (9), Ireland, Japan, Singapore (10)
10.0 to less than 15.0	<b>Int'l Avg. (12)</b> Georgia, Romania (14)	Poland, Canada, Finland, <b>MA-USA</b> , Macao-Ch., Ch. Taipei (11) Liechtenstein (12) <b>CT-USA (13)</b> Switzerland, Netherlands, Australia, Germany (14), Denmark (15)
15.0 to less than 20.0	Azerbaijan (18)	Belgium, Norway, New Zealand (16) <b>USA</b> , United Kingdom, Czech Rep., Latvia, <b>FL-USA (17)</b> <b>OECD Avg.</b> , Spain (18), Croatia, Portugal, France, Austria (19) Italy, Hungary (20)
20.0 to less than 25.0	Malta, Trinidad and Tobago (22) Islamic Rep. of Iran (24), Dubai-UAE (25)	Iceland, Slovenia, Lithuania (21) Turkey, Luxembourg, Russian Fed. (22) Greece, Sweden (23) Israel (24)
25.0 to less than 30.0	Maltese-MLT (26) Colombia (28)	Slovak Rep. (28)
30.0 to less than 35.0	Indonesia (34)	Costa Rica (32) Cyprus, Thailand, Chile, Rep. of Serbia (33)
35.0 to less than 40.0	Saudi Arabia (35) United Arab Emirates (36)	United Arab Emirates (36) Romania (37) Bulgaria (39)
40.0 or more	Abu Dhabi-UAE, Qatar (40) Oman (53) Morocco (79)	Mexico (41) Rep. of Montenegro (43) Uruguay (47), Brazil, Tunisia (49), Jordan, Colombia (51) Albania (52), Malaysia (53), Argentina (54), Indonesia (55) Kazakhstan, Qatar (57), Peru (60)

■ = 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: Countries are listed by the percentage of students performing at the lowest levels of performance (rounded percentages in parentheses): below the *PIRLS Low International Benchmark* (400) for grade 4 and below *PISA Proficiency Level 2* (407) 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 low-performing students for the International (Int'l)/OECD average and United States are presented in bold font. While the formulation and construction of assessment scales are the same across PIRLS, TIMSS, 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 U.S. 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 low-performing students

	Grade 4 (TIMSS 2011)	Grade 8 (TIMSS 2011)	Age 15 (PISA 2012)
Less than 5.0	Rep. of Korea (0), Netherlands, Belgium-Fl., Hong Kong-Ch., Japan, Ch. Taipei, Singapore, Quebec-Ca. (1), <b>NC-USA</b> , Finland (2), <b>FL-USA</b> , Germany, Russian Fed., Portugal, Denmark (3) <b>USA</b> , Northern Ireland-UK, Lithuania (4), Austria (5)	Singapore, Rep. of Korea (1) Quebec-Ca., <b>MA-USA</b> (2) <b>MN-USA</b> , Hong Kong-Ch., Japan (3) Ch. Taipei, Finland (4), <b>NC-USA</b> , <b>IN-USA</b> (5)	Shanghai-Ch. (4)
5.0 to less than 10.0	Alberta-Ca., Slovenia, Ontario-Ca., Ireland (6) England-UK, Czech Republic, Sweden, Italy (7) Norway (9) Croatia, Slovak Rep., Australia, Rep. of Serbia (10)	Alberta-Ca., Russian Fed. (5) Ontario-Ca., <b>FL-USA</b> (6) <b>CO-USA</b> , Slovenia (7) <b>USA</b> (8) <b>CT-USA</b> (9), Lithuania, Italy (10)	Singapore (8) Hong Kong-Ch., Rep. of Korea (9)
10.0 to less than 15.0	Hungary (10) Malta, Kazakhstan (12) Spain, Poland (13)	Australia, Sweden (11) England-UK, Hungary (12) <b>CA-USA</b> , Israel, Norway (13) Kazakhstan (15)	Estonia, Macao-Ch., Japan (11) Finland, Switzerland (12) Ch. Taipei (13) Canada, Liechtenstein, Vietnam, Poland (14) Netherlands (15)
15.0 to less than 20.0	New Zealand (15) <b>Int'l Avg. (18)</b>	New Zealand (16) Ukraine (19)	Denmark, Ireland (17) Germany, <b>MA-USA</b> (18) Austria, Belgium (19), Australia, Latvia (20) Slovenia (20)
20.0 to less than 25.0	Romania (21) Chile, Thailand, Turkey (23)	Dubai-UAE, <b>AL-USA</b> (21) Armenia (24)	<b>CT-USA</b> , Czech Rep., Iceland (21) United Kingdom, Norway, France (22) New Zealand, <b>OECD Avg. (23)</b> Spain, Russian Fed., Luxembourg (24) Italy, Portugal (25)
25.0 to less than 30.0	Dubai-UAE (25) Georgia, Azerbaijan, Armenia (28)	Lebanon, United Arab Emirates, <b>Int'l Avg. (27)</b> Romania, Abu-Dhabi-UAE (29)	<b>USA</b> , Lithuania (26) Sweden, Slovak Rep. (27) Hungary (28) Croatia (30)
30.0 to less than 35.0	Bahrain (33)	Turkey (33) Malaysia (35)	<b>FL-USA</b> (30) Israel (34)
35.0 to less than 40.0	Islamic Rep. of Iran, United Arab Emirates (36)	Georgia, Thailand (38) Tunisia, Rep. of Macedonia (39)	Greece (36) Rep. of Serbia (39)
40.0 or more	Abu Dhabi-UAE (42) Qatar, Saudi Arabia (45) Oman (54) Tunisia (65) Kuwait (70), Morocco (74) Yemen (91)	Chile (43) Islamic Rep. of Iran, Jordan (45), Qatar (46) Bahrain (47), Palestinian Nat'l Auth. (48) Saudi Arabia (53) Syrian Arab Republic, Indonesia (57) Oman (61), Morocco (64) Ghana (79)	Romania (41), Turkey, Cyprus (42) Bulgaria (44), Kazakhstan (45) United Arab Emirates (46), Thailand (50) Chile, Malaysia (52), Mexico (55) Uruguay (56), Rep. of Montenegro (57) Costa Rica (60), Albania (61) Argentina (66), Brazil (67), Tunisia (68) Jordan (69), Qatar (70), Colombia (74) Peru (75), Indonesia (76)

■ = 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: Countries are listed by the percentage of students performing at the lowest levels of performance (rounded percentages in parentheses): below the *TIMSS Low International Benchmark* (400) for grade 4 or 8 and below *PISA Proficiency Level 2* (420) 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 low-performing students for the International (Int'l)/OECD average and United States are presented in bold font. While the formulation and construction of assessment scales are the same across PIRLS, TIMSS, 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 U.S. 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 low-performing students	SCIENCE		
	Grade 4 (TIMSS 2011)	Grade 8 (TIMSS 2011)	Age 15 (PISA 2012)
Less than 5.0	Rep. of Korea, Finland, Netherlands, Japan (1) Russian Fed. (2), Quebec-Ca., <b>FL-USA</b> , Ch. Taipei, Alberta-Ca., Singapore, Czech Rep. (3), Belgium-Fl., Croatia, Austria, Germany, <b>USA</b> , Hong Kong-Ch. (4) <b>NC-USA</b> , Sweden, Denmark (5)	Finland (1) Alberta-Ca., <b>MN-USA</b> (2) Rep. of Korea, Japan (3), <b>MA-USA</b> , Ch. Taipei, <b>CO-USA</b> , Slovenia, Russian Fed., Singapore Quebec-Ca., Ontario-Ca. (4) <b>IN-USA</b> (5)	Shanghai-Ch. (3)
5.0 to less than 10.0	Italy, Lithuania, Portugal (5) Ontario-Ca., Slovak Rep., Northern Ireland-UK (6) Slovenia, England-UK, Hungary (7) Norway, Ireland, Spain (8) Australia, Rep. of Serbia, Poland (9)	Hong Kong-Ch. (5) <b>NC-USA</b> (6) <b>FL-USA</b> , England-UK, <b>USA</b> (7) Lithuania, Australia, <b>CT-USA</b> , Hungary (8) Sweden (9), Italy (10)	Estonia (5) Hong Kong-Ch. (6) Rep. of Korea, Vietnam (7) Finland, Japan (8) Macao-Ch., Poland (9), Singapore, Ch. Taipei (10)
10.0 to less than 15.0	New Zealand (14)	Norway, New Zealand (10)  Ukraine, Israel, <b>CA-USA</b> (12)  Kazakhstan (14)	Liechtenstein, Canada (10), Ireland, <b>MA-USA</b> (11) Germany, Latvia (12) Switzerland, Slovenia, Netherlands, <b>CT-USA</b> (13) Australia, Czech Rep. (14) United Kingdom (15)
15.0 to less than 20.0	Chile (15) Kazakhstan, Romania (16)  <b>Int'l Avg. (19)</b>	<b>AL-USA</b> (17)	Spain, Austria, Lithuania, New Zealand (16) Denmark, Croatia (17) Belgium, <b>OECD Avg.</b> , Hungary, <b>USA</b> (18) Italy, France, Russian Fed., Portugal (19) Norway (20)
20.0 to less than 25.0	Thailand (22)  Turkey (24), Georgia (25)	Dubai-UAE (21) Chile, Islamic Rep. of Iran, Turkey (21) Romania (22) <b>Int'l Avg. (23)</b>	<b>FL-USA</b> (21) Luxembourg, Sweden (22)  Iceland (24)
25.0 to less than 30.0	Islamic Rep. of Iran, Dubai-UAE (28) Malta, Bahrain (30)	United Arab Emirates (25) Abu Dhabi-UAE, Thailand (26)  Jordan, Tunisia (28) Bahrain (30)	Greece, Turkey (26) Slovak Rep. (27)  Israel (29)
30.0 to less than 35.0	Azerbaijan (35)	Saudi Arabia (32)  Armenia (34)	Thailand, Chile (34), Rep. of Serbia (35)
35.0 to less than 40.0	Saudi Arabia (37)  United Arab Emirates (39)	Syrian Arab Republic (37) Malaysia, Georgia (38)	United Arab Emirates (35)  Bulgaria, Romania (37) Cyprus (38) Costa Rica (39)
40.0 or more	Armenia (42) Abu Dhabi-UAE (45) Qatar (50) Oman (55)  Kuwait (63) Tunisia (65)  Morocco (84) Yemen (94)	Palestinian Nat'l Auth., Oman (41), Qatar (42) Indonesia, Lebanon (46), Rep. of Macedonia (47)  Morocco (61)  Ghana (78)	Kazakhstan (42) Malaysia (46), Uruguay, Mexico (47) Jordan (50), Rep. of Montenegro, Argentina (51) Albania (53), Brazil (54) Tunisia (55), Colombia (56) Qatar (63)  Indonesia (67), Peru (68)

■ = 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: Countries are listed by the percentage of students performing at the lowest levels of performance (rounded percentages in parentheses): below the *TIMSS Low International Benchmark* (400) for grade 4 or 8 and below *PISA Proficiency Level 2* (410) 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 low-performing students for the International (Int'l)/OECD average and United States are presented in bold font. While the formulation and construction of assessment scales are the same across PIRLS, TIMSS, 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 U.S. 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.