International Assessments

Among 15-year-old students, 29 education systems had higher average scores than the United States in mathematics literacy, 22 had higher average scores in science literacy, and 19 had higher average scores in reading literacy, according to the 2012 Program for International Student Assessment (PISA).

The Program for International Student Assessment (PISA), coordinated by the Organization for Economic Cooperation and Development (OECD), has measured the performance of 15-year-old students in mathematics, science, and reading literacy every 3 years since 2000. In 2012, PISA was administered in 65 countries and education systems, including all 34 member countries of the OECD. In addition to participating in the U.S. national sample, three states—Connecticut, Florida, and Massachusetts—opted to participate as individual education systems and had separate samples of public schools and public-school students included in PISA to obtain state-level results. PISA 2012 results are reported by average scale score (from 0 to 1,000) as well as by the percentage of students reaching particular proficiency levels. Proficiency results are presented in terms of the percentages of students reaching proficiency level 5 or above (i.e., percentages of top performers) and the percentages of students performing below proficiency level 2 (i.e., percentages of low performers).

Table 1. Average scores of 15-year-old students on the Program for International Student Assessment (PISA) mathematics literacy scale, by education system: 2012

Education system	Average score	Education system	Average score
OECD average	494 0	OECD average	494 🕚
Shanghai-CHN	613 🖸	Lithuania	479
Singapore	573 🗅	Sweden	478
Hong Kong-CHN	561 🕚	Hungary	477
Chinese Taipei-CHN	560 🕚	Croatia	471 🕥
Korea, Republic of	554 O	Israel	466 🕥
Macao-CHN	538 🗅	Greece	453 🕥
Japan	536 🕚	Serbia, Republic of	449 🖲
Liechtenstein	535 O	Turkey	448 🖲
Switzerland	531 🕚	Romania	445 🛡
Netherlands	523 O	Cyprus	440 🛡
Estonia	521 🗅	Bulgaria	439 🕥
Finland	519 🕚	United Arab Emirates	434 🕥
Canada	518 🔷	Kazakhstan	432 🕥
Poland	518 🕚	Thailand	427 🕥
Belgium	515 🗅	Chile	423 🖲
Germany	514 🕚	Malaysia	421 🖲
Vietnam	511 O	Mexico	413 🖲
Austria	506 🕚	Montenegro, Republic of	410 🖲
Australia	504 O	Uruguay	409 🖲
reland	501 🕚	Costa Rica	407 🕥
Slovenia	501 🕚	Albania	394 🕥
Denmark	500 O	Brazil	391 🖲
New Zealand	500 O	Argentina	388 🖲
Czech Republic	499 O	Tunisia	388 🖲
France	495 O	Jordan	386 🖲
United Kingdom	494 O	Colombia	376 🖲
Iceland	493 🕚	Qatar	376 🛡
Latvia	491 🕚	Indonesia	375 🕥
Luxembourg	490 🕚	Peru	368 🕥
Norway	489		
Portugal	487		
Italy	485		
Spain	484	U.S. state education systems	
Russian Federation	482	Massachusetts	514 🕚
Slovak Republic	482	Connecticut	506 🔕
Inited States	491	Florida	167 🔿

• Average score is higher than U.S. average score. • Average score is lower than U.S. average score.

NOTE: Education systems are ordered by 2012 average score. The Organization for Economic Cooperation and Development (OECD) average is the average of the national averages of the OECD member countries, with each country weighted equally. Scores are reported on a scale from 0 to 1,000. All average scores reported as higher or lower than the U.S. average score are different at the .05 level of statistical significance. Italics indicate non-OECD education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012. See Digest of Education Statistics 2013, table 602.60.

In 2012, average scores in mathematics literacy ranged from 368 in Peru to 613 in Shanghai-CHN. The U.S. average mathematics score (481) was lower than the average for all OECD countries (494). Twenty-nine education systems and two U.S. states had higher average mathematics scores than the U.S. average score and nine had scores not measurably different from the U.S. score. The 29 education systems with scores higher than the U.S. average score were Shanghai-CHN, Singapore, Hong Kong-CHN, Chinese Taipei-CHN, the Republic of Korea, Macao-CHN, Japan, Liechtenstein, Switzerland, the Netherlands, Estonia, Finland, Canada, Poland, Belgium, Germany, Vietnam, Austria, Australia, Ireland, Slovenia, Denmark, New Zealand, the Czech Republic, France, the United Kingdom, Iceland, Latvia, and Luxembourg. Within the United States, Massachusetts (514) and Connecticut (506) had scores higher than the U.S. average.

In addition to scoring above the U.S. average, Massachusetts scored above the OECD average. Connecticut scored above the U.S. national average, but its score was not measurably different from the OECD average. Florida's average score (467) was below the U.S. national average.

Education system	Below level 2	a	Levels 5	Education system	Below level 2	a	Levels	5
	23*		13*		23*		13	2*
Shanahai-CHN	1*		55*	Sweden	27		8	
Singapore	8*		40*	Spain	24		8	
Chinese Tainei-CHN	13*		37*	Latvia	20*		8	į
Hona Kona-CHN	9*		.34*	Russian Federation	24		8	4
Korea, Republic of	9*		31*	Croatia	30*		7	
Liechtenstein	14*		25*	Turkev	42*		6	*
Macao-CHN	11*		24*	Serbia, Republic of	39*		5	;*
Japan	11*		24*	Bulgaria	44*		4	t*
Switzerland	12*		21*	Greece	36*		4	t*
Belgium	19*		20*	Cyprus	42*		4	t*
Netherlands	15*		19*	United Arab Emirates	46*		3	;*
Germany	18*		17*	Romania	41*		3	5*
Poland	14*		17*	Thailand	50*		3	5*
Canada	14*		16*	Qatar	70*		2)*
Finland	12*		15*	Chile	52*		2)*
New Zealand	23*		15*	Uruguay	56*		1	*
Australia	20*		15*	Malaysia	52*		1	*
Estonia	11*		15*	Montenegro, Republic of	57*		1	*
Austria	19*		14*	Kazakhstan	45*		1!	*
Slovenia	20*		14*	Albania	61*		1	*
Vietnam	14*		13*	Tunisia	68*		1!	*
France	22*		13*	Brazil	67*		1	*
Czech Republic	21*		13*	Mexico	55*		1	*
United Kingdom	22		12*	Peru	75*		1!	*
Luxembourg	24		11*	Costa Rica	60*		1!	*
Iceland	21*		11*	Jordan	69*		+	
Slovak Republic	27		11	Columbia	74*		#!	*
Ireland	17*		11*	Indonesia	76*		‡	
Portugal	25		11	Argentina	66*		#!	*
Denmark	17*		10		0 20	40 60	80 1	100
Italy	25		10			Percent		
Norway	22*		9					
Israel	34*		9	U.S. state education system	ns			
Hungary	28		9	Massachusetts	18*		19	*
United States	26		9	Connecticut	21*		16)*
Lithuania	26		8	Florida	30*		6)*
	0 20	40 60 Percent	80 100		0 20	40 60 Percent	80 1	100

Figure 1. Percentage of 15-year-old students performing on the Program for International Student Assessment (PISA) mathematics literacy scale, by selected proficiency level and education system: 2012

Below level 2 Levels 5 and above

Rounds to zero

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.

‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.

* p < .05. Significantly different from the U.S. percentage at the .05 level of statistical significance.

NOTE: Education systems are ordered by 2012 percentages of 15-year-olds at levels 5 and above. To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into mathematics proficiency levels according to their scores. Exact cut scores are as follows: below level 1 (a score less than or equal to 357.77); level 1 (a score greater than 357.77 and less than or equal to 420.07); level 2 (a score greater than 482.38 and less than or equal to 544.68); level 4 (a score greater than 544.68 and less than or equal to 606.99); level 5 (a score greater than 606.99 and less than or equal to 669.30); and level 6 (a score greater than 669.30). Scores are reported on a scale from 0 to 1,000. The Organization for Economic Cooperation and Development (OECD) average is the average of the national percentages of the OECD member countries, with each country weighted equally. Italics indicate non-OECD education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012. See Digest of Education Statistics 2013, table 602.60.

PISA reports mathematics literacy in terms of six proficiency levels, with level 1 being the lowest and level 6 being the highest. Students scoring at proficiency levels 5 and above are considered to be top performers since they have demonstrated advanced mathematical thinking and reasoning skills required to solve problems of greater complexity. The percentage of top performers in the United States was lower than the average of the OECD countries' percentages of top performers (9 vs. 13 percent). Percentages of top performers ranged from near 0 percent in Colombia and Argentina to 55 percent in Shanghai-CHN. Twenty-seven education systems and two U.S. states had higher percentages of top performers in mathematics literacy than the United States. Massachusetts and Connecticut both had higher percentages of top performers (19 and 16 percent, respectively) than the United States (9 percent), while Florida had a lower percentage (6 percent). A higher percentage (26 percent) of 15-year-olds in the United States scored below proficiency level 2 in mathematics literacy than the average of the OECD countries' percentages (23 percent). Percentages of low performers ranged from 4 percent in Shanghai-CHN to 76 percent in Indonesia. Twenty-nine education systems and two U.S. states had lower percentages of

Chapter: 3/Elementary and Secondary Education Section: Assessments

low performers than the United States in mathematics literacy. The U.S. percentage of low performers was higher than the percentages for both Massachusetts (18 percent) and Connecticut (21 percent). The percentage of low performers in Florida (30 percent) was not measurably different from the U.S. percentage.

Table 2.	Average scores of 15-year-old students on the Program for International Student Assessment (PISA) science
	literacy scale, by education system: 2012

Education system	Average score	Education system	Average sco	ore
OECD average	501	OECD average	501	
Shanghai-CHN	580 🗅	Russian Federation	486	۲
Hong Kong-CHN	555 🗅	Sweden	485	۲
Singapore	551 O	Iceland	478	۲
Japan	547 🗅	Slovak Republic	471	\bigcirc
Finland	545 🗅	Israel	470	۲
Estonia	541 🗅	Greece	467	۲
Korea, Republic of	538 🗅	Turkey	463	\mathbf{v}
Vietnam	528 🗅	United Arab Emirates	448	\mathbf{v}
Poland	526 🗅	Bulgaria	446	۲
Canada	525 🗅	Chile	445	۲
Liechtenstein	525 🗅	Serbia, Republic of	445	۲
Germany	524 🗅	Thailand	444	۲
Chinese Taipei-CHN	523 🗅	Romania	439	۲
Netherlands	522 🕚	Cyprus	438	۲
Ireland	522 🔕	Costa Rica	429	۲
Australia	521 🕚	Kazakhstan	425	۲
Macao-CHN	521 🔕	Malaysia	420	۲
New Zealand	516 🔕	Uruguay	416	۲
Switzerland	515 🔕	Mexico	415	T
Slovenia	514 🕚	Montenegro, Republic of	410	۲
United Kingdom	514 🕚	Jordan	409	۲
Czech Republic	508 🕚	Argentina	406	۲
Austria	506	Brazil	405	۲
Belgium	505	Colombia	399	۲
Latvia	502	Tunisia	398	۲
France	499	Albania	397	T
Denmark	498	Qatar	384	T
United States	497	Indonesia	382	۲
Spain	496	Peru	373	۲
Lithuania	496			
Norway	495			
Hungary	494			
Italy	494	U.S. state education systems		
Croatia	491	Massachusetts	527	0
Luxembourg	491	Connecticut	521	0
Portugal	489	Florida	485	

Average score is higher than U.S. average score. Average score is lower than U.S. average score. NOTE: Education systems are ordered by 2012 average score. The Organization for Economic Cooperation and Development (OECD) average is the average NOTE: Education systems are ordered by 2012 average score. The Organization for Economic Cooperation and Development (OECD) average is the average of the national averages of the OECD member countries, with each country weighted equally. Scores are reported on a scale from 0 to 1,000. All average scores reported as higher or lower than the U.S. average score are different at the .05 level of statistical significance. Italics indicate non-OECD education

systems. Results for Connecticut, Florida, and Massachusetts are for public school students only. SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012. See Digest of Education Statistics 2013, table 602.70.

In science literacy, average scores ranged from 373 in Peru to 580 in Shanghai-CHN. The U.S. average science score (497) was not measurably different from the OECD average (501). Twenty-two education systems and 2 U.S. states had higher average science scores than the United States, and 13 systems and 1 U.S. state had scores that were not measurably different. The 22 education systems with higher scores than the U.S. average score were

Shanghai-CHN, Hong Kong-CHN, Singapore, Japan, Finland, Estonia, the Republic of Korea, Vietnam, Poland, Canada, Liechtenstein, Germany, Chinese Taipei-CHN, the Netherlands, Ireland, Australia, Macao-CHN, New Zealand, Switzerland, Slovenia, the United Kingdom, and the Czech Republic. Within the United States, Massachusetts and Connecticut scored above the U.S. average.

Chapter: 3/Elementary and Secondary Education Section: Assessments

In addition to scoring above the U.S. national average, Massachusetts (527) and Connecticut (521) also scored above the OECD average. Florida (485) had an average score not measurably different from the U.S. average and lower than the OECD average.

Figure 2.	Percentage of 15-year-old students performing on the Program for International Student Assessment (PISA)
	science literacy scale, by selected proficiency level and education system: 2012

Education system	Below level 2	Levels 5 and above	Education system	Below level 2	a	Levels 5 nd above
OECD average	18	8	OFCD average	18		8
Shanahai-CHN	3*	27*	Spain	16		5*
Sinaapore	10*	23*	Croatia	17		5*
Japan	8*	18*	Portugal	19		5*
Finland	8*	17*	Latvia	12*		4*
Hona Kona-CHN	6*	17*	Russian Federation	19		4*
Australia	14*	14*	Bulgaria	37*		3*
New Zealand	16	13*	United Arab Emirates	35*		3*
Estonia	5*	13*	Greece	26*	_	2*
Germany	12*	12*	Cyprus	38*		2*
Netherlands	13*	12*	Turkev	26*	_	2*
Korea, Republic of	7*	12*	Serbia, Republic of	35*		2*
Canada	10*	11*	Qatar	63*		1*
United Kinadom	15	11*	Uruguay	47*		1*
Poland	9*	11*	Chile	34*		1*
Ireland	11*	11*	Thailand	34*		1*
Liechtenstein	10*	10	Romania	37*		1!*
Slovenia	13*	10*	Albania	53*		#!*
Switzerland	13*	9	Montenegro, Republic of	51*		#!*
Belaium	18	9	Malavsia	46*		#!*
Chinese Taipei-CHN	10*	8	Brazil	54*		#!*
Luxemboura	22*	8	Jordan	50*		‡
Vietnam	7*	8	Argentina	51*		#!*
France	19	8	Costa Rica	39*		#!*
Austria	16	8	Kazakhstan	42*		#!*
Czech Republic	14*	8	Mexico	47*		#!*
Norway	20	8	Colombia	56*		‡
United States	18	7	Tunisia	55*		‡
Denmark	17	7	Indonesia	67*		‡
Macao-CHN	9*	7	Peru	68*		‡
Sweden	22*	6		0 20	40 60	80 100
Italy	19	6			Percent	
Hungary	18	6				
Israel	29*	6	U.S. state education system	ns		
Iceland	24*	5*	Massachusetts	11*		14*
Lithuania	16	5*	Connecticut	13*		13*
Slovak Republic	27*	5	Florida	21		5
·	0 20 40) 60 80 100		0 20	40 60	80 100
	P	ercent			Percent	

Below level 2

Levels 5 and above

Rounds to zero.

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.

 ‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
 * p < .05. Significantly different from the U.S. percentage at the .05 level of statistical significance.
 NOTE: Education systems are ordered by 2012 percentages of 15-year-olds at levels 5 and above. To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into science proficiency levels according to their scores. Exact cut scores are as follows: below level 1 (a score less than or equal to 334.94); level 1 (a score greater than 334.94 and less than or equal to 409.54); level 2 (a score greater than 409.54 and less than or equal to 484.14); level 3 (a score greater than 484.14 and less than or equal to 558.73); level 4 (a score greater than 558.73 and less than or equal to 633.33); level 5 (a score greater than 633.33 and less than or equal to 707.93); and level 6 (a score greater than 707.93). Scores are reported on a scale from 0 to 1,000. The Organization for Economic Cooperation and Development (OECD) average is the average of the national percentages of the OECD member countries, with each country weighted equally. Italics indicate non-OECD education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012. See Digest of Education Statistics 2013, table 602.70.

Similar to PISA's reporting of mathematics literacy, PISA also reports science literacy by six proficiency levels, with level 1 being the lowest and level 6 being the highest. Students performing at levels 5 and 6 can apply scientific knowledge in a variety of complex life situations. The percentage of U.S. top performers on the science literacy scale (7 percent) was not measurably different from the average of the OECD countries' percentages of top performers (8 percent). Percentages of top performers ranged from near 0 percent in eight education systems to 27 percent in Shanghai-CHN. Sixteen education systems and two U.S. states had percentages of top performers higher than the United States in science literacy. Massachusetts and Connecticut both had higher percentages of top performers (14 and 13 percent,

Chapter: 3/Elementary and Secondary Education Section: Assessments

respectively) than the United States, while Florida had a percentage that was not measurably different (5 percent).

The percentage of U.S. students who scored below proficiency level 2 in science literacy was not measurably different from the average of the OECD countries' percentages (both 18 percent). Percentages of low performers ranged from 3 percent in Shanghai-CHN to 68 percent in Peru. Twenty-one education systems and two U.S. states, Massachusetts and Connecticut (11 and 13 percent, respectively), had lower percentages of low performers than the United States in science literacy. The percentage of low performers for Florida (21 percent) was not measurably different from the percentage for the United States.

Table 3.	Average scores of 15-year-old students on the Program for International Student Assessment (PI	SA) reading
	literacy scale, by education system: 2012	

Education system	Average score	Education system	Average score
OECD average	496	OECD average	496
Shanghai-CHN	570 🕚	Iceland	483 🖲
Hong Kong-CHN	545 🕚	Slovenia	481 🖲
Singapore	542 🕚	Lithuania	477 🖲
Japan	538 🕚	Greece	477 🖲
Korea, Republic of	536 🕚	Turkey	475 🖲
Finland	524 🕚	Russian Federation	475 🖲
Ireland	523 🕚	Slovak Republic	463 🖲
Chinese Taipei-CHN	523 🕚	Cyprus	449 🗑
Canada	523 🕚	Serbia, Republic of	446 🖲
Poland	518 🕚	United Arab Emirates	442 🕥
Estonia	516 🕚	Chile	441 🕥
Liechtenstein	516 🕚	Thailand	441 🖲
New Zealand	512 🕚	Costa Rica	441 🔍
Australia	512 🕚	Romania	438 🔍
Netherlands	511 🕚	Bulgaria	436 🛡
Switzerland	509 🕚	Mexico	424 🖲
Macao-CHN	509 🕚	Montenegro, Republic of	422 🕄
Belgium	509 🕚	Uruguay	411 🖲
Vietnam	508	Brazil	410 🖲
Germany	508 🕚	Tunisia	404 🕥
France	505	Colombia	403 🕥
Norway	504	Jordan	399 🕥
United Kingdom	499	Malaysia	398 🛡
United States	498	Indonesia	396 🕥
Denmark	496	Argentina	396 🕥
Czech Republic	493	Albania	394 🕥
Italy	490	Kazakhstan	393 🖲
Austria	490	Qatar	388 🔍
Latvia	489 🕥	Peru	384 🔍
Hungary	488		
Spain	488 🛡		
Luxembourg	488 🕥		
Portugal	488	U.S. state education systems	
Israel	486	Massachusetts	527 🕚
Croatia	485 🕥	Connecticut	521 🕚
Sweden	483 🕥	Florida	492

• Average score is higher than U.S. average score.

© Average score is lower than U.s. average score. © Average score is lower than U.S. average score. NOTE: Education systems are ordered by 2012 average score. The Organization for Economic Cooperation and Development (OECD) average is the average of the national averages of the OECD member countries, with each country weighted equally. Scores are reported on a scale from 0 to 1,000. All average scores reported as higher or lower than the U.S. average score are different at the .05 level of statistical significance. Italics indicate non-OECD education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only.

SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012. See Digest of Education Statistics 2013, table 602.50.

In reading literacy, average scores ranged from 384 in Peru to 570 in Shanghai-CHN. The U.S. average score (498) was not measurably different from the OECD average (496). Nineteen education systems and 2 U.S. states had higher average reading scores and 11 education systems and 1 U.S. state had scores that were not measurably different. The 19 education systems with higher average scores than the United States in reading literacy were

Chapter: 3/Elementary and Secondary Education Section: Assessments

Shanghai-CHN, Hong Kong-CHN, Singapore, Japan, the Republic of Korea, Finland, Ireland, Chinese Taipei-CHN, Canada, Poland, Estonia, Liechtenstein, New Zealand, Australia, the Netherlands, Switzerland, Macao-CHN, Belgium, and Germany. Within the United States, Massachusetts and Connecticut, scored above the US. average.

Figure 3.	Percentage of 15-year-old students performing on the Program for International Student Assessment (PISA)
	reading literacy scale, by selected proficiency level and education system: 2012

Education system	Below level 2	Levels 5 and above	Education system	Below level 2	c	Levels 5 and above
OECD average	18	8	OECD average	18		8
Shanghai-CHN	3*	25*	Russian Federation	22*		5*
Singapore	10*	21*	Vietnam	9*		5*
Japan	10*	18*	Croatia	19		4*
Hong Kong-CHN	7*	17*	Slovak Republic	28*		4*
Korea, Republic of	8*	14*	Turkey	22*		4*
New Zealand	16	14*	Bulgaria	39*		4*
Finland	11	13*	Latvia	17		4*
France	19	13*	Cyprus	33*		4*
Canada	11	13*	Lithuania	21*		3*
Chinese Taipei-CHN	11	12*	Serbia, Republic of	33*		2*
Belgium	16	12*	United Arab Emirates	36*		2*
Australia	14	12*	Qatar	57*		2*
Ireland	10*	11*	Romania	37*		2*
Liechtenstein	12	11	Albania	52*		1*
Norway	16	10*	Montenegro, Republic of	43*		1*
Poland	11	10	Uruguay	47*		1*
Netherlands	14	10	Thailand	33*		1*
Israel	24*	10	Chile	33*		1*
Switzerland	14*	9	Costa Rica	32*		1!*
Germany	14	9	Argentina	54*		1*
Luxembourg	22*	9	Brazil	49*		1*
United Kingdom	17	9	Peru	60*		#!*
Estonia	9*	8	Mexico	41*		#*
United States	17	8	Colombia	51*		#!*
Sweden	23*	8	Tunisia	49*		‡
Macao-CHN	11*	7	Jordan	51*		‡
Italy	20*	7	Malaysia	53*		‡
Czech Republic	17	6*	Indonesia	55*		±
Iceland	21*	6*	Kazakhstan	57*		‡
Portugal	19	6*		0 20	40 60	80 100
Hungary	20	6*		0 20	Percent	
Spain	18	6*				
Austria	19	6*	U.S. state education system	ms		
Denmark	15	5*	Massachusetts	11*		16*
Greece	23*	5*	Connecticut	13		15*
Slovenia	21*	5*	Florida	17		6*
	0 20	40 60 80 10	0	0 20	40 60	80 100

Below level 2

Levels 5 and above

Rounds to zero

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.

‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.

‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
* p < .05. Significantly different from the U.S. percentage at the .05 level of statistical significance.</p>
NOTE: Education systems are ordered by 2012 percentages of 15-year-olds at levels 5 and above. To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into reading proficiency levels according to their scores. Exact cut scores are as follows: below level 1b (a score less than or equal to 262.04); level 1b (a score greater than 262.04 and less than or equal to 334.75); level 1a (a score greater than 334.75 and less than or equal to 407.47); level 2 (a score greater than 407.47 and less than or equal to 480.18); level 3 (a score greater than 402.80 and less than or equal to 552.98); level 4 (a score greater than 552.98 and less than or equal to 625.61); level 5 (a score greater than 625.61 and less than or equal to 698.32); and level 6 (a score greater than 68.32). Scores are reported on a scale from 0 to 1,000. The Organization for Economic Cooperation and Development (OECD) average is the average of the national percentages of the OECD member countries, with each country weighted equally. Italics indicate non-OECD education systems. Results for Connecticut, Florida, and Massachusetts are for public school students only. SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2012. See Digest of Education Statistics 2013, table 602.50.

In reading, Massachusetts (527) and Connecticut (521) scored above both the U.S. national average and the OECD average. Florida had an average reading score (492) that was not measurably different from either the U.S. average or the OECD average.

PISA reports reading literacy by seven proficiency levels, with level 1b being the lowest and level 6 being the highest. At levels 5 and 6, students have mastered sophisticated reading skills required to interpret and evaluate deeply embedded or abstract text. The percentage of U.S. top performers on the reading literacy scale was not measurably different from the average of the OECD countries' percentages of top performers (both 8 percent). Percentages of top performers ranged from near 0 percent in three education systems to 25 percent in Shanghai-CHN. Fourteen education systems and two U.S. states had percentages of top performers higher than the United States in reading literacy. Massachusetts and Connecticut both had higher percentages of top performers (16 and 15 percent, respectively) than the United States, while Florida had a lower percentage (6 percent).

The percentage of U.S. students who were low performers in reading literacy was not measurably different from the average of the OECD countries' percentages of low performers (17 and 18 percent, respectively). Percentages of low performers ranged from 3 percent in Shanghai-CHN to 60 percent in Peru. Fourteen education systems and one U.S. state had lower percentages of low performers than the United States in reading literacy. Massachusetts had a lower percentage (11 percent) than the United States, while Connecticut and Florida both **Chapter:** 3/Elementary and Secondary Education **Section:** Assessments

had percentages that were not measurably different (13 and 17 percent, respectively).

The United States also participates in the Trends in International Mathematics and Science Study (TIMSS) and the Progress in International Reading Literacy Study (PIRLS). Both assessments are coordinated by the TIMSS & PIRLS International Study Center at Boston College, under the auspices of the International Association for the Evaluation of Educational Achievement (IEA), an international organization of national research institutions and governmental research agencies. TIMSS assesses mathematics and science knowledge and skills at grades 4 and 8, and PIRLS assesses reading literacy at grade 4.

In 2011, there were 57 education systems that had TIMSS mathematics and science data at grade 4 and 56 education systems that had these data at grade 8. Education systems include countries (complete, independent, and political entities) and other benchmarking education systems (portions of a country, nation, kingdom, or emirate, or other non-national entities). These benchmarking systems are able to participate in TIMSS even though they may not be members of the IEA. Participating allows them the opportunity to assess their students' achievement and to view their curricula in an international context. In addition to participating in the U.S. national sample, several U.S. states participated individually and are included as education systems. At the 4th-grade level, two U.S. states (Florida and North Carolina) participated; at the 8th-grade level, nine U.S. states (Alabama, California, Colorado, Connecticut, Florida, Indiana, Massachusetts, Minnesota, and North Carolina) participated.

Table 4. Average minis mamematics assessment scale scoles of 4m-grade studems, by education system. 20	Table 4.	Average TIMSS mathematics	assessment scale scores	of 4th-grade students, k	by education system: 20
--	----------	---------------------------	-------------------------	--------------------------	-------------------------

Grade	4	Grade 4		
Education system	Average score	Education system	Average score	
TIMSS scale average	500	TIMSS scale average	500	
Singapore ¹	606 🕚	New Zealand	486 🕥	
Korea, Republic of	605 🕚	Spain	482 🕥	
Hong Kong-CHN ¹	602 🕚	Romania	482 🕥	
Chinese Taipei-CHN	591 🕚	Poland	481 🕥	
Japan	585 🕚	Turkey	469 🕥	
Northern Ireland-GBR ²	562 🔘	Azerbaijan ^{1,5}	463 🕥	
Belgium (Flemish)-BEL	549 🕚	Chile	462 🕥	
Finland	545	Thailand	458 🕥	
England-GBR	542	Armenia	452 🕥	
Russian Federation	542	Georgia ^{3,5}	450 🕥	
United States ¹	541	Bahrain	436 🕥	
Netherlands ²	540	United Arab Emirates	434 🕥	
Denmark ¹	537	Iran, Islamic Republic of	431 🕥	
Lithuania ^{1,3}	534 🕥	Qatar ¹	413 🕥	
Portugal	532 🕥	Saudi Arabia	410 🕥	
Germany	528 🕥	Oman ⁶	385 🕥	
Ireland	527 🕥	Tunisia ⁶	359 🕥	
Serbia, Republic of ¹	516 🕥	Kuwait ^{3,7}	342 🕥	
Australia	516 🕥	Morocco ⁷	335 🕥	
Hungary	515 🕥	Yemen ⁷	248 🕥	
Slovenia	513 🕥			
Czech Republic	511 🕥			
Austria	508 🕥	Benchmarking education s	systems	
Italy	508 🕥	North Carolina-USA ^{1,3}	554 🌢	
Slovak Republic	507 🕥	Florida-USA ^{3,8}	545	
Sweden	504 🕥	Quebec-CAN	533 🕥	
Kazakhstan ¹	501 🕥	Ontario-CAN	518 🕥	
Malta	496 🕥	Alberta-CAN ¹	507 🕥	
Norway ⁴	495 🕥	Dubai-UAE	468 🕥	
Croatia ¹	490 🕥	Abu Dhabi-UAE	417 🐨	

• Average score is lower than U.S. average score.

National Defined Population covers 90 to 95 percent of National Target Population defined by TIMSS.

² Met guidelines for sample participation rates only after replacement schools were included.

³ National Target Population does not include all of the International Target Population defined by TIMSS.

⁴ Nearly satisfied guidelines for sample participation rates after replacement schools were included.

⁵ Exclusion rates for Azerbaijan and Georgia are slightly underestimated as some conflict zones were not covered and no official statistics were available. ⁶ The TIMSS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 15 percent, though it is less than 25 percent.

⁷ The TIMSS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 25 percent.

⁸ National Defined Population covers less than 90 percent, but at least 77 percent, of National Target Population defined by TIMSS.

NOTE: Education systems are ordered by 2011 average score. Italics indicate participants identified and counted in this report as an education system and not as a separate country. Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale average set at 500 and the standard deviation set at 100. The TIMSS average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average. All U.S. state data are based on public school students only. SOURCE: Provasnik, S., Kastberg, D., Ferraro, D., Lemanski, N., Roey, S., and Jenkins, F. (2012). *Highlights From TIMSS 2011: Mathematics and Science Achievement of U.S. Forder Students in an International Context* (NCES 2013-009), table 3, data from the International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2011. See *Digest of Education Statistics 2013*, table 602.20.

At grade 4, the U.S. average mathematics score (541) in 2011 was higher than the TIMSS scale average (500). The United States was among the top 15 education systems in mathematics (8 education systems had higher average scores, and 6 had scores that were not measurably different), and the United States scored higher, on average, than 42 education systems. Seven education systems with average mathematics scores above the U.S. score were Belgium (Flemish)-BEL, Chinese Taipei-CHN, Hong Kong-CHN, Japan, Northern Ireland-GBR, the Republic of Korea, and Singapore. Among the U.S. states that participated at grade 4, both North Carolina and Florida had average mathematics scores above the TIMSS scale average. North Carolina's score was higher than the U.S. national average; however, Florida's score was not measurably different from the U.S. national average in mathematics.

Table 5.	Average TIMSS science	assessment scale scores	of 4th-grade	students, by	education system: 2011
----------	-----------------------	-------------------------	--------------	--------------	------------------------

Grade	4	Grade 4	
Education system	Average score	Education system	Average score
TIMSS scale average	500	TIMSS scale average	500
Korea, Republic of	587 🗅	New Zealand	497 🕥
Singapore ¹	583 🗅	Kazakhstan ¹	495 🕥
Finland	570 🗅	Norway ⁴	494 🕥
Japan	559 🗅	Chile	480 🕥
Russian Federation	552 🗅	Thailand	472 🕥
Chinese Taipei-CHN	552 🗅	Turkey	463 🕥
United States ¹	544	Georgia ^{3,5}	455 🕥
Czech Republic	536 🕥	Iran, Islamic Republic of	453 🕥
Hong Kong-CHN ¹	535 🕥	Bahrain	449 🕥
Hungary	534 🕥	Malta	446 🕥
Sweden	533 🕥	Azerbaijan ^{1,5}	438 🕥
Slovak Republic	532 🕥	Saudi Arabia	429 🕥
Austria	532 🕥	United Arab Emirates	428 🕥
Netherlands ²	531 🕥	Armenia	416 🕥
England-GBR	529 🕥	Qatar ¹	394 🕥
Denmark ¹	528 🕥	Oman	377 🕥
Germany	528 🕥	Kuwait ^{3,6}	347 🕥
Italy	524 🕥	Tunisia ⁶	346 🕥
Portugal	522 🕥	Morocco ⁷	264 🕥
Slovenia	520 🕥	Yemen ⁷	209 🕥
Northern Ireland-GBR ²	517 🕥		
Ireland	516 🕥		
Croatia ¹	516 🕥	Benchmarking education s	systems
Australia	516 🕥	Florida-USA ^{3,8}	545
Serbia, Republic of ¹	516 🕥	Alberta-CAN ¹	541
Lithuania ^{1,3}	515 🕥	North Carolina-USA ^{1,3}	538
Belgium (Flemish)-BEL	509 🕥	Ontario-CAN	528 🕥
Romania	505 🕥	Quebec-CAN	516 🕥
Spain	505 🕥	Dubai-UAE	461 🕥
Poland	505 🕥	Abu Dhabi-UAF	411 🕥

Average score is lower than U.S. average score.
 National Defined Population covers 90 to 95 percent of National Target Population defined by TIMSS.

² Met guidelines for sample participation rates only after replacement schools were included.

³ National Target Population does not include all of the International Target Population defined by TIMSS.

⁴ Nearly satisfied guidelines for sample participation rates after replacement schools were included.

⁵ Exclusion rates for Azerbaijan and Georgia are slightly underestimated as some conflict zones were not covered and no official statistics were available. ⁶ The TIMSS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 15 percent, though it is less than 25 percent. ⁷ The TIMSS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with

achievement too low for estimation exceeds 25 percent.

⁸ National Defined Population covers less than 90 percent, but at least 77 percent, of National Target Population defined by TIMSS.

NOTE: Education systems are ordered by 2011 average score. Italics indicate participants identified and counted in this report as an education system and not as a separate country. Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale average set at 500 and the standard deviation set at 100. The TIMSS average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average. All U.S. state data are based on public school students only. SOURCE: Provasnik, S., Kastberg, D., Ferraro, D., Lemanski, N., Roey, S., and Jenkins, F. (2012). Highlights From *TIMSS 2011: Mathematics and Science Achievement* of U.S. Fourth- and Eighth-Grade Students in an International Context (NCES 2013-009), table 26, data from the International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2011. See Digest of Education Statistics 2013, table 602.20.

At grade 4, the U.S. average science score (544) was higher than the TIMSS scale average of 500. The United States was among the top 10 education systems in science (6 education systems had higher average science scores, and 3 had scores that were not measurably different). The United States also scored higher, on average, than 47 education systems in 2011. The six education systems

with average science scores above the U.S. score were Chinese Taipei-CHN, Finland, Japan, the Republic of Korea, the Russian Federation, and Singapore. Of the participating education systems within the United States, both Florida and North Carolina scored above the TIMSS scale average, but their science scores were not measurably different from the U.S. national average.

Table 6.	Average TIMSS mathematics	assessment scale scores	of 8th-grade students, k	by education system: 2011
----------	---------------------------	-------------------------	--------------------------	---------------------------

Grade 8	i	Grade 8	
Education system	Average score	Education system	Average score
TIMSS scale average	500	TIMSS scale average	500
Korea, Republic of	613 🕚	Chile	416 🕥
Singapore ¹	611 🕚	Iran, Islamic Republic of ⁶	415 🕥
Chinese Taipei-CHN	609 🕚	Qatar ⁶	410 🕥
Hong Kong-CHN	586 🕚	Bahrain ⁶	409 🕥
Japan	570 🕚	Jordan ⁶	406 🕥
Russian Federation ¹	539 🕚	Palestinian National Authority	404 🕥
Israel ²	516	Saudi Arabia ⁶	394 🕥
Finland	514	Indonesia ⁶	386 🕥
United States ¹	509	Syrian Arab Republic ⁶	380 🕥
England-GBR ³	507	Morocco ⁷	371 🕥
Hungary	505	Oman⁰	366 🕥
Australia	505	Ghana ⁷	331 🕥
Slovenia	505		
Lithuania⁴	502		
Italy	498 🕥		
New Zealand	488 🕥	Benchmarking education sys	tems
Kazakhstan	487 🕥	Massachusetts-USA ^{1,4}	561 🕚
Sweden	484 🕥	Minnesota-USA ⁴	545 🗅
Ukraine	479 🕥	North Carolina-USA ^{2,4}	537 🕚
Norway	475 🕥	Quebec-CAN	532 🕚
Armenia	467 🕥	Indiana-USA ^{1,4}	522 🗅
Romania	458 🕥	Colorado-USA ⁴	518
United Arab Emirates	456 🕥	Connecticut-USA ^{1,4}	518
Turkey	452 🕥	Florida-USA ^{1,4}	513
Lebanon	449 🕥	Ontario-CAN ¹	512
Malaysia	440 🕥	Alberta-CAN ¹	505
Georgia ^{4,5}	431 🕥	California-USA ^{1,4}	493 🕥
Thailand	427 🕥	Dubai-UAE	478 🕥
Macedonia, Republic of ⁶	426 🕥	Alabama-USA⁴	466 🕥
Tunisia	425 🕥	Abu Dhabi-UAE	449 🕥

Average score is lower than U.S. average score.

¹ National Defined Population covers 90 to 95 percent of National Target Population defined by TIMSS.

² National Defined Population covers less than 90 percent, but at least 77 percent, of National Target Population defined by TIMSS.

³ Nearly satisfied guidelines for sample participation rates after replacement schools were included. ⁴ National Target Population does not include all of the International Target Population defined by TIMSS.

⁵ Exclusion rates for Georgia are slightly underestimated as some conflict zones were not covered and no official statistics were available

6 The TIMSS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with

achievement too low for estimation exceeds 15 percent, though it is less than 25 percent. ⁷ The TIMSS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 25 percent.

NOTE: Education systems are ordered by 2011 average score. Italics indicate participants identified and counted in this report as an education system and not as a separate country. Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale average set at 500 and the standard deviation set at 100. The TIMSS average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average. All U.S. state data are based on public school students only. SOURCE: Provasnik, S., Kastberg, D., Ferraro, D., Lemanski, N., Roey, S., and Jenkins, F. (2012). *Highlights From TIMSS 2011: Mathematics and Science Achievement* of U.S. Fourth- and Eighth-Grade Students in an International Context (NCES 2013-009), table 4, data from the International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2011. See Digest of Education Statistics 2013, table 602.30.

At grade 8, the U.S. average mathematics score (509) was higher than the TIMSS scale average of 500. The United States was among the top 24 education systems in mathematics in 2011 (11 education systems had higher average scores, and 12 had scores that were not measurably different). In addition, the United States scored higher, on average, than 32 education systems. The 11 education systems with average mathematics scores above the U.S. score were Chinese Taipei-CHN, Hong Kong-CHN, Japan, Quebec-CAN, the Republic of Korea, the Russian Federation, Singapore, and, within the United States, Indiana, Massachusetts, Minnesota, and North Carolina.

In addition to scoring above the U.S. average in 8thgrade mathematics, Indiana, Massachusetts, Minnesota, and North Carolina also scored above the TIMSS scale average. Colorado, Connecticut, and Florida scored above the TIMSS scale average, but their scores were not measurably different from the U.S. national average. California's score was not measurably different from the TIMSS scale average, but it was below the U.S. national average; Alabama scored below both the TIMSS scale average and the U.S. national average in mathematics.

Table 7.	Average TIMSS science of	assessment scale scores	of 8th-grade students,	by education system: 2011
----------	--------------------------	-------------------------	------------------------	---------------------------

Grade 8		Grade 8	
Education system	Average score	Education system	Average score
TIMSS scale average	500	TIMSS scale average	500
Singapore ¹	590 🕚	Saudi Arabia	436 🕥
Chinese Taipei-CHN	564 🕚	Malaysia	426 🕥
Korea, Republic of	560 🕚	Syrian Arab Republic	426 🕥
Japan	558 🗅	Palestinian National Authority	420 🕥
Finland	552 🕚	Georgia ^{4,5}	420 🕥
Slovenia	543 🕚	Oman	420 🕥
Russian Federation ¹	542 🗅	Qatar	419 🕥
Hong Kong-CHN	535 🕚	Macedonia, Republic of	407 🕥
England-GBR ²	533	Lebanon	406 🕥
United States ¹	525	Indonesia	406 🕥
Hungary	522	Morocco	376 🕥
Australia	519	Ghana⁴	306 🕥
Israel ³	516		
Lithuania ⁴	514 🕥		
New Zealand	512 🕥		
Sweden	509 🕥	Benchmarking education sys	tems
Italy	501 🕥	Massachusetts-USA ^{1,4}	567 🕚
Ukraine	501 🕥	Minnesota-USA ⁴	553 🕚
Norway	494 🕥	Alberta-CAN ¹	546 🕚
Kazakhstan	490 🕥	Colorado-USA ⁴	542 🕚
Turkey	483 🕥	Indiana-USA ^{1,4}	533
Iran, Islamic Republic of	474 🕥	Connecticut-USA ^{1,4}	532
Romania	465 🕥	North Carolina-USA ^{3,4}	532
United Arab Emirates	465 🕥	Florida-USA ^{1,4}	530
Chile	461 🕥	Ontario-CAN ¹	521
Bahrain	452 🕥	Quebec-CAN	520
Thailand	451 🕥	California-USA ^{1,4}	499 🕥
Jordan	449 🕥	Alabama-USA⁴	485 🕥
Tunisia	439 🕥	Dubai-UAE	485 🕥
Armenia	437 🕥	Abu Dhabi-UAE	461 🕥

• Average score is lower than U.S. average score.

¹ National Defined Population covers 90 to 95 percent of National Target Population defined by TIMSS.

² Nearly satisfied guidelines for sample participation rates after replacement schools were included.

³ National Defined Population covers less than 90 percent, but at least 77 percent, of National Target Population defined by TIMSS.

⁴ National Target Population does not include all of the International Target Population defined by TIMSS.

⁵ Exclusion rates for Georgia are slightly underestimated as some conflict zones were not covered and no official statistics were available.
⁶ The TIMSS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with

⁶ The TIMSS International Study Center has reservations about the reliability of the average achievement score because the percentage of students wit achievement too low for estimation exceeds 15 percent, though it is less than 25 percent.

NOTE: Education systems are ordered by 2011 average score. Italics indicate participants identified and counted in this report as an education system and not as a separate country. Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale average set at 500 and the standard deviation set at 100. The TIMSS average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average. All U.S. state data are based on public school students only. SOURCE: Provasnik, S., Kastberg, D., Ferraro, D., Lemanski, N., Roey, S., and Jenkins, F. (2012). *Highlights From TIMSS 2011: Mathematics and Science Achievement* of U.S. Fourth- and Eighth-Grade Students in an International Context (NCES 2013-009), table 27, data from the International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2011. See Digest of Education Statistics 2013, table 602.30.

At grade 8, the U.S. average science score (525) was higher than the TIMSS scale average of 500. The United States was among the top 23 education systems in science in 2011 (12 education systems had higher average scores, and 10 had scores that were not measurably different). The United States scored higher, on average, than 33 education systems. The 12 education systems with average science scores above the U.S. score were Alberta-CAN, Chinese Taipei-CHN, Finland, Hong Kong-CHN, Japan, the Republic of Korea, the Russian Federation, Singapore, Slovenia, and, within the United States, Colorado, Massachusetts, and Minnesota. Aside from scoring above the U.S. average in 8th-grade science, Colorado, Massachusetts, and Minnesota also scored above the TIMSS scale average of 500. Connecticut, Florida, Indiana, and North Carolina scored above the TIMSS scale average, but their scores were not measurably different from the U.S. national average. California's score was not measurably different from the TIMSS scale average, but it was below the U.S. national average; Alabama scored below both the TIMSS scale average and the U.S. national average in science.

Figure 4. Number of instructional hours per year for 4th-grade students, by country or education system and subject: 2011

Education system					
International average	162 85	650	897		
Armenia	139 54	658	851		
Australia ¹	230 65	713		1,008	
Austria	146 96	566	808		
Azerbaijan ^{2,3}	130 61	613	804		
Bahrain ¹	131 85	748		964	
Belgium (Flemish)-BEL ^{1,4}	224	786		1,010	
Chile ¹	231 161		836		1,228
Chinese Taipei-CHN ¹	133 90	766		989	
Croatia ²	134 95	547	776		
Czech Republic	163 60	559	782		
Denmark ^{1,2}	124 62	677	863	_	
England-GBR ¹	188 76	706		970	
Finland	139 98	542	779		
Georgia ^{1,3,5}	148 110	490	748		
Germany ¹	163 75	625	863		
Hong Kong-CHN ^{1,2}	158 88	813		1,059	
Hungary	148 72	540	760		
Iran, Islamic Republic of	146 106	475	/27		
Ireland		641	854],	
Italy ¹		793		1,085	
Japan	150 9	650			
Kazaknstan ²	140 57	582			
Kored, Republic of		5/0	<u></u>	20	
Kuwait ^{1,5}	120 85	/23		28	
Lithuania ^{2,3}		456 649			
	183 39	009		1 040	
Notocco ¹		022			
New Zogland	168 52	705		1,074	
	232 72	705	92	.5 7070	
	157 55	605	817] 4/0	
Oman ¹	170 120	709	017	<u> </u>	
Poland ¹	157 64	543	764		
Portugal	250 162	528	<u></u>	240	
Qatar ²	185 135	748	,	1.068	
Romania	148 56	592	796		
Russian Federation ¹	104 49	507 660			
Saudi Arabia ¹	147 82	748		977	
Serbia, Republic of ²	153 72	553	778	-	
Singapore ²	208 96	708		1,012	
Slovak Republic	147 101	532	780		
Slovenia	169 101	414 684	—		
Spain ¹	167 145	572	884		
Sweden ¹	138 75	636	849		
Thailand ¹	167 109	92	:5		1,201
Tunisia ¹	175 93	695		963	
Turkey	126 94	680	900		
United Arab Emirates ¹	154 108	763		1,025	
United States ^{1,2}	206 105	767		1,078	
Yemen ¹	135 91	605	831		
Benchmarking education systems					
Abu Dhabi-UAE ¹	150 110	773		1,033	
Alberta-CAN ^{1,2}	169 130	707			
Dubai-UAE ¹	158 99	736			
Horida-USA ^{1,5,7}		743		1,0/3	•
NORTH Carolina-USA ^{1,2,5}	221 94	/98		I,II	3
Ontario-CAN'	201 92	6/6		Тара	
Quebec-CAN		63/	<u> </u>	<u> </u>	
(J 100 200 300	400 500 600 700	800 900	1,000 1,100 1	,200 1,300
		Number of instruction	al hours		
		Math Science	Other [®]		

See notes on next page.

Data for number of math, science, and/or total instructional hours are available for at least 50 percent but less than 85 percent of students.

² National Defined Population covers 90 to 95 percent of National Target Population defined by TIMSS.

³ Exclusion rates for Azerbaijan and Georgia are slightly underestimated as some conflict zones were not covered and no official statistics were available. ⁴ Data for instructional hours in science are not available. Other instructional hours calculated by subtracting instruction hours in mathematics from total instructional hours.

⁵ National Target Population does not include all of the International Target Population defined by TIMSS.

⁶ Met guidelines for sample participation rates only after replacement schools were included.

⁷ National Defined Population covers less than 90 percent, but at least 77 percent, of National Target Population defined by TIMSS.

⁸ Other instructional hours calculated by adding instructional hours in mathematics to instructional hours in science and then subtracting from total instructional hours

NOTE: Italics indicate participants identified and counted in this report as an education system and not as a separate country. Instructional times shown in this table are actual or implemented times (as opposed to intended times prescribed by the curriculum). Principals reported total instructional hours per day and school days per year. Total instructional hours per year were calculated by multiplying the number of school days per year by the number of instructional hours per day. Teachers reported instructional hours per week in mathematics and science. Instructional hours per year in mathematics and science were calculated by dividing weekly instructional hours by the number of school days per week and then multiplying by the number of school days per year International average instructional hours includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IAE), which develops and implements TIMSS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average. All U.S. state data are based on public school students only. SOURCE: Mullis, I.V.S., Martin, M.O., Foy, P., and Arora, A. (2012). *TIMSS 2011 International Results in Mathematics*, exhibit 8.6, and Martin, M.O., Mullis, I.V.S., Foy, P., and Stanco, G.M. (2012). *TIMSS 2011 International Results in Science*, exhibit 8.6. See *Digest of Education Statistics 2013*, table 602.20.

In addition to assessing achievement in mathematics and science, TIMSS collects information from principals on the total number of annual instructional hours in school. TIMSS also collects information from teachers on the number of annual instructional hours spent on mathematics and science instruction at grades 4 and 8. In 2011, education systems (excluding the benchmarking participants) participating in TIMSS at grade 4 spent an average of 897 total hours on instructional time, of which an average of 162 hours (18 percent) were spent on mathematics instruction and 85 hours (9 percent) were spent on science instruction. In 2011, the average number of total instructional hours (1,078 hours) spent in the United States at grade 4 was higher than the international average (897 hours). The average numbers of instructional hours spent on grade 4 mathematics instruction (206 hours) and science instruction (105 hours) in the United States were also higher than the international averages (162 and 85 hours, respectively).

Figure 5. Number of instructional hours per year for 8th-grade students, by country or education system and subject: 2011

Education system							
International average	138	158	735		1,031		
Armenia ¹	143	240	596	97	'9		
Australia ¹	143	131	765		1,039		
Bahrain ¹	142	130	747		1,019		
Chile ¹	193	134	91	8		1,245	
Chinese Taipei-CHN	166	157	830		1,153		
England-GBR ^{1,2}	116	102	774	99	92		
Finland ¹	105	190	639	934			
Georgia ^{1,3,4}	123	198	512	833			
Ghana ¹	165	148	840		1,153		
Hong Kong-CHN ¹	138	103	785		1,026		
Hungary	119	236	481	836			
Indonesia	173	190		1,131			1,494
Iran, Islamic Republic of	124	120	750	9	94		
Israel ^{1,5}	165	132	811		1,108		
Italy	155	73	857		1,085		
Japan	108	128	780		1,016		
Jordan	130	134	777		1,041		
Kazakhstan	117	244	559	920			
Korea, Republic of	137	126	743	1	,006		
Lebanon ^{1,6}	178		850		1,028		
Lithuania ^{1,3}	132	251	515	898			
Macedonia, Republic of ¹	122	334	567		1,023		
Malaysia ¹	123	126	949		1,1	98	
Morocco ¹	148	144	1,	011		1,303	
New Zealand ¹	141	130	688	959			
Norway	125	101	654	880			
Oman ¹	161	161	722		1,044		
Palestinian National Authority ¹	134	107	677	918			
Qatar ¹	162	131	761		1,054		
Romania	145	281	558	98	34		
Russian Federation ⁷	142	208	532	882			
Saudi Arabia ¹	134	124	792		1,050		
Singapore ⁷	138	115	853		1,106		
Slovenia	121	251	426	798			
Sweden	97	94	778	96	9		
Syrian Arab Republic ¹	118	150	543	811			
Thailand ¹	129	119	1,022			1,270	
Tunisia ¹	131	64	1,104			1,299	
Turkey	117	99	673	889			
Ukraine	132	239	530	901			
United Arab Emirates ¹	157	115	774		1,046		
United States ^{1,7,8}	157	139	818		1,114		
Benchmarking education systems							
Abu Dhabi-UAE'	158	111	776		1,045		
Alabama-USA ^{1,3}	166	167	802		1,135		
Alberta-CAN ^{1,7}	156	145	730		1,031		
California-USA ^{1,3,6,7}	172		868		1,040		
Colorado-USA ^{1,3}	173	138	837		1,148		
Connecticut-USA ^{1,3,7}	144	139	788		1,071		
Dubai-UAE ¹	155	125	742		1,022		
Florida-USA ^{1,3,6,7}	144		975		1,119		
Indiana-USA ^{1,3,7}	149	132	852		1,133		
Massachusetts-USA ^{1,3,7}	154	156	777		1.087		
Minnesota-USA ^{1,3}	142	140	761		1,043		
North Carolina-USA ^{1,3,5,6}	185		974		1,159		
Ontario-CAN ^{1,7}	181	96	694	971			
Quebec-CAN ¹	147	102	664	913			
		2000 2000			0 1 100 1 000	1 200 1 400	1.500
	U 100	200 300 4	400 500 600 /00 8	300 900 I,00	0 1,100 1,200	1,300 1,400	1,500
			Number of instruc	ctional hours			
			Math Scier	nce 🗖 Othe	er ⁹		

See notes on next page.

¹ Data for number of math and/or science instructional hours are available for at least 50 percent but less than 85 percent of students.

Nearly satisfied auidelines for sample participation rate after replacement schools were included ³ Target Population does not include all of the International Target Population defined by TIMSS.

⁴ Exclusion rates for Georgia are slightly underestimated as some conflict zones were not covered and no official statistics were available. ⁵ National Defined Population covers less than 90 percent, but at least 77 percent, of National Target Population defined by TIMSS

⁶ Data for instructional hours in science were not available. Other instructional hours calculated by subtracting instruction hours in mathematics from total instructional hours.

⁸ National Defined Population covers 90 to 95 percent of National Target Population defined by TIMSS.
⁸ Data for science are for 2007 and are from TIMSS 2007 International Results in Science. Met guidelines for sample participation rates only after substitute

schools were included. Data for number of math instructional hours are available for at least 50 percent but less than 70 percent of students ° Other instructional hours calculated by adding instructional hours in mathematics to instructional hours in science and then subtracting from total instructional hours.

NOTE: Instructional times shown in this table are actual or implemented times (as opposed to intended times prescribed by the curriculum). Principals reported total instructional hours per day and school days per year. Total instructional hours per year were calculated by multiplying the number of school days per year by the number of instructional hours per day. Teachers reported instructional hours per week in mathematics and science. Instructional hours per year in mathematics and science were calculated by dividing weekly instructional hours by the number of school days per week and then multiplying by the number of school days per year. International average instructional hours includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IAE), which develops and implements TIMSS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average. All U.S. state data are based on public school students only. SOURCE: Mullis, I.V.S., Martin, M.O., Foy, P., and Arora, A. (2012). *TIMSS 2011 International Results in Mathematics*, exhibit 8.7, and Martin, M.O., Mullis, I.V.S., Foy, P., and Stanco, G.M. (2012). *TIMSS 2011 International Results in Science*, exhibit 8.7. See *Digest of Education Statistics 2013*, table 602.30.

At grade 8, education systems (excluding the benchmarking participants) participating in TIMSS spent an average of 1,031 total annual hours on instructional time in 2011, of which 138 hours (13 percent) were spent on mathematics instruction and 158 hours (15 percent) were spent on science instruction. Similar to the findings

at grade 4, the United States' average number of total instructional hours at grade 8 (1,114 hours) was higher than the international average (1,031 hours). The average hours spent on grade 8 mathematics instruction (157 hours) in the United States was also higher than the international average (138 hours).

Average PIRLS reading literacy assessment scale scores of 4th-grade students, by education system: 2011 Table 8.

	reading average		Overall reading average
Education system	scale score	Education system	scale score
PIRLS scale average	500	PIRLS scale average	500
Hong Kong-CHN'	5/10	France	520 🔍
Russian Federation	568 0	Spain	513 🖤
Finland	568 0	Norway ⁵	507 文
Singapore ²	567 🕚	Belgium (French)-BEL ^{2,3}	506 🛡
Northern Ireland-GBR ³	558	Romania	502 🛡
United States ²	556	Georgia ^{4,6}	488 🛡
Denmark ²	554	Malta	477 🛡
Croatia ²	553	Trinidad and Tobago	471 🐨
Chinese Taipei-CHN	553	Azerbaijan ^{2,6}	462 🗑
Ireland	552	Iran, Islamic Republic of	457 🐨
England-GBR ³	552	Colombia	448 🖲
Canada ²	548 🛡	United Arab Emirates	439 🛡
Netherlands ³	546 🛡	Saudi Arabia	430 🗑
Czech Republic	545 🛡	Indonesia	428 🗑
Sweden	542 🛡	Qatar ²	425 🕥
Italy	541 🕥	Oman ⁷	391 🛡
Germany	541 🛡	Morocco ⁸	310 文
Israel ¹	541 🕥		
Portugal	541 🕥		
Hungary	539 🕥	Benchmarking education sy	stems
Slovak Republic	535 🕥	Florida-USA ^{1,4}	569 🛇
Bulgaria	532 🕥	Ontario-CAN ²	552
New Zealand	531 🛡	Alberta-CAN ²	548 🖲
Slovenia	530 🕥	Quebec-CAN	538 🖲
Austria	529 🕥	Andalusia-ESP	515 🖲
Lithuania ^{2,4}	528 🕥	Dubai-UAE	476 🐨
Australia	527 🕥	Maltese-MLT	457 🐨
Poland	526 🛡	Abu Dhabi-UAE	424 🛡

• Average score is higher than U.S. average score. • Average score is lower than U.S. average score.

¹ National Defined Population covers less than 90 percent of National Target Population defined by PIRLS

² National Defined Population covers 90 percent to 95 percent of National Target Population defined by PIRLS.

³ Met guidelines for sample participation rates only after replacement schools were included. ⁴ National Target Population does not include all of the International Target Population defined by PIRLS.

⁵ Nearly satisfied guidelines for sample participation rates after replacement schools were included.

^a Exclusion rates for Azerbaijan and Georgia are slightly underestimated as some conflict zones were not covered and no official statistics were available.
 ^a The PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with

achievement too low for estimation exceeds 15 percent, though it is less than 25 percent ⁸ The PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with

achievement too low for estimation exceeds 25 percent.

NOTE: Education systems are ordered by 2011 average score. Italics indicate participants identified and counted in this report as an education system and not as a separate country. The Progress in International Reading Literacy Study (PIRLS) scores are reported on a scale from 0 to 1,000, with the scale average set at 500 and the standard deviation set at 100. The PIRLS average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements PIRLS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average. All U.S. state data are based on public school students only.

SOURCE: Thompson, S., Provasnik, S., Kastberg, D., Ferraro, D., Lemanski, N., Roey, S., and Jenkins, F. (2012). Highlights From PIRLS 2011: Reading Achievement of U.S. Fourth-Grade Students in an International Context (NCES 2013-010), table 3, data from the International Association for the Evaluation of Educational Achievement (IEA), Progress in International Reading Literacy Study (PIRLS), 2011. See Digest of Education Statistics 2013, table 602.10.

In 2011, there were 53 education systems that had PIRLS reading literacy data at grade 4. These 53 education systems included both countries and other benchmarking education systems. In addition to participating in the U.S. national sample, Florida participated individually and was included as an education system. In 2011, the U.S. average 4th-grade reading literacy score (556) was higher than the PIRLS scale average (500). The United States was among the top 13 education systems in reading literacy (5 education systems had higher average scores, and 7 had scores that were not measurably different).

The United States scored higher, on average, than 40 education systems.

The five education systems with average reading scores above the U.S. score were Finland, Hong Kong-CHN, the Russian Federation, Singapore, and, within the United States, Florida. Additionally, Florida's average score (569) was higher than the PIRLS scale average. No education system scored higher than Florida, although four had scores that were not measurably different. Forty-eight education systems scored lower than Florida.

Chapter: 3/Elementary and Secondary Education **Section:** Assessments

Reference tables: *Digest of Education Statistics 2013*, tables 602.10, 602.20, 602.30, 602.50, 602.60, and 602.70

Related indicators: Educational Attainment of Young Adults, International Educational Attainment, U.S. Student and Adult Performance on International Assessments of Educational Achievement [*The Condition of Education 2006 Special Analysis*], U.S. Performance Across International Assessments of Student Achievement [*The Condition of Education 2009 Special Analysis*] **Glossary:** Organization for Economic Cooperation and Development (OECD)