THE GAMES IN REVIEW

Presented by the
Thomas B. Fordham Institute

A supplement to the
Education Olympics web event
held between August 8 and
August 22, 2008

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Preface

This report has a simple aim: to present results from international assessments so readers can judge for themselves how American students stack up globally. It's intended to be a stand-alone supplement to our "Education Olympics" web event held between August 8th and August 22nd, 2008 (see www.edolympics.net). It shows how the U.S. has performed internationally in education in recent years, and it provides a glimpse of how education looks in several top-performing nations.

The focus of this report is comparative achievement data, but we obviously recognize that test scores aren't the only things worth knowing about education. But they are *something*. How important they are has, of course, been debated for decades — at least since *A Nation at Risk* rang the alarm and argued that other countries were passing us by.

After *A Nation at Risk*'s publication in 1983, some disputed or downplayed its significance. Some do the same thing today when faced with mediocre international results. One strategy, epitomized by researcher cum public-school advocate Gerald Bracey, is to insist that international assessments are inherently flawed, that their results are nothing but apples-to-oranges comparisons. Another favorite Bracey complaint — also publicly aired this summer by George Washington University Professor Iris Rotberg — centers around who takes the tests — e.g., what are the ages of the students? Are all of a country's youngsters represented? We don't have time to chase those rabbits, but international assessments are indeed governed by committees (the International Association for the Evaluation of Educational Achievement or IEA, for instance) that ensure countries adhere to participation guidelines, including ones dealing with representativeness.[1]

Another strategy is to question whether test results matter at all. Consider the latest reflections in the *Wilson Quarterly* from Jay Mathews, the crackerjack veteran *Washington Post* education reporter. He echoes Bracey's arguments, writing that "there is scant evidence that test scores have much to do with national economic performance." Mathews seems to insinuate that, even if mostly flat line NAEP results and mediocre international results are *real*, we need not worry because test scores have no relationship to economies.

Perhaps Mathews should acquaint himself with Eric Hanushek's recent research on this very topic. Hanushek and his colleagues (Jamison, Jamison, and Woessman) used student performance on twelve standardized international tests in math and science as a measure of "cognitive skills" among those entering the workforce. They analyzed these data for 50 countries from 1960 to 2000. The countries included 30 democracies with market economies and relatively high levels of economic development and 20 countries with lower levels of economic development.

Though the analysis was complicated, Hanushek's key finding was simple: The level of cognitive skills of a nation's students has a large effect on its subsequent economic growth rate. He also found that more years of schooling, previously thought to be the major advantage that other countries had over the U.S., only boosted the economy when it was tied with student learning. In other words, "It is not enough simply to spend more time in school; something has to be learned there."

Differences among countries' growth in their gross domestic products could be attributed, in part, to higher levels of cognitive skill as measured on international tests. In fact, the researchers estimate that a highly skilled workforce can raise economic growth by about two-thirds

1 For instance, for the TIMSS, countries are required to sample students in the upper of the two grades that contain the largest number of 9- and 13-year olds. In the U.S. and most countries, this corresponds to grades 4 and 8. Countries not satisfying one or more guidelines for sample participation are clearly noted in international reports.

of a percentage point every year. Upon first blush, this doesn't sound all that impressive, but consider that a one percent higher growth rate sustained over 50 years yields incomes that are 64 percent higher.

So, then, a relationship exists between increased student achievement on international measures and a healthy economy. But not so fast, say challengers in the "defend-public-education-at-all-costs" camp. They'd likely point out (Hanushek does) that the U.S. has *never* done particularly well on international assessments; we're as average as they come. Still, our GDP growth rate has been *higher* than average over the past 100 years. The authors, then, pose a reasonable question: If cognitive skills, as measured by international results, are so important to economic growth, how can we explain what's happened in the U.S.?

The short answer, according to Hanushek and colleagues, is we have other educational and economic advantages. Educationally, the manner in which we expanded our education system over the 20th century — opening secondary schools at record numbers — is credited with stimulating economic growth, as are our renowned U.S. colleges and universities. Economically, the researchers extol our freer labor markets, reduced government regulation of firms, less powerful trade unions, and lower tax rates as growth boosters.

Lest we be content to rest on our laurels, though, the analysts close with this warning:

Although the strengths of the U.S. economy and its higher-education system offer some hope for the future, the situation at the K–12 level should spark concerns about the long-term outlook for the U.S. economy, which could eventually have an impact on the higher-education system as well...Other countries are doing more to secure property rights and open their economies, which will enable them to make better use of their human capital. Most obviously, the historic advantage of the U.S. in school attainment has come to an end, as half of the OECD countries now exceed the U.S. in the average number of years of education their citizens receive. Those trends could easily accelerate in the coming decades.

Simply put, we're living on borrowed time. Can we really afford to ignore what can only be described as our students' very *ordinary* performance on international exams? Sure, Americans score above average on some measures, but when it comes to comparisons with our economic peers, we fall pretty short. Isn't it possible that time is running out in terms of maintaining our economic edge?

In the pages that follow, we present recent results from the most important and widely used international assessments of student performance. They include the Trends in International Mathematics and Science Study (TIMSS), the Progress in International Reading Literacy Study (PIRLS), The Programme for International Student Assessment (PISA), and the Civic Education Study (CIVED). We also consider high school and college graduation rates, and list the top three performers, our "medal winners," in 58 discreet "events." Unlike in the athletic Olympics, U.S. performance in the "Education Olympics" is, shall we say, uninspiring. Our strong performance in civics, in fact, avoids a complete medal shutout for the old red, white, and blue. Contrast this with our performance in the 2008 Summer Olympics in Beijing where the United States took home 110 medals (36 gold, 38 silver, 36 bronze medals), more than any other nation.[2]

We've also sprinkled throughout our report some interesting sidebar blurbs about the top performing nations (according to our medal counts), since we're naturally curious about how education looks in these countries and what we might learn from them. We don't draw conclusions from these blurbs; they're intended to raise questions more than provide answers. Likewise, our report is not meant to be exhaustive or comprehensive, but user-friendly, suggestive, and even illuminating.

2 China was second with 100 total medals.

Executive Summary

Fact: The United States trails many of its economic peers on international measures that assess students' reading, mathematics, and science performance. Some people are deeply alarmed by that fact; others think there's no need to overreact. This report lays out the international evidence, in one pithy PDF file, so that you can judge for yourself whether there's cause for a nationwide shot in the arm or not.

In recent weeks, we at the Thomas B. Fordham Institute have hosted a friendly international competition called the "Education Olympics." We know the U.S. typically kicks some Olympic derriere every four years when the international competitions roll around. In fact, in the last ten summer or winter Olympic games, the U.S. has been among the top five medal winners. The games in Beijing were no exception. We led the overall total medal count with 110, making it the fourth straight Olympics that the U.S. has come home with the most medals. Our performance across the globe in education, however, is in stark contrast to the exhilarating athletic victories forged overseas. While the physical prowess of our athletes enables the U.S. to lug home buckets of shiny medals, our academic dexterity needs some serious sweat-on-your-brow training.

This report presents the international data in a way that mirrors our Education Olympics web-event. In addition to compiling the overall results from several international assessments, we've laid out "chunks" of data (which we call "events") that highlight student performance on sub-tests or by sub-groups (such as males and females). We've awarded gold, silver, and bronze medals to those countries achieving at the highest levels. Some analysts won't like the fact that we've ranked these nations (see more about this in Chapter 1). Still, we hope that they (and you) will take the standings in the Olympic spirit in which they're bestowed—and not as statistical precision.

We examine results from four well-known and generally respected international measures:

1. The Programme for International Student Assessment (PISA). This one covers math and science (like TIMSS), but also evaluates reading literacy and students' ability to apply what they've learned to real-world situations. It's administered to fifteen-year-olds every three years. We're examining data from both the 2003 and 2006 PISA administrations.
2. The Trends in International Mathematics and Science Study (TIMSS). This assessment addresses the knowledge and skills that students have acquired by grade four and eight in math and science.[3] It's administered every four years and we report on the latest year, 2003. [Results from the 2007 administration are not yet available.]
3. The Progress in International Reading Literacy Study (PIRLS). This exam covers trends in primary school reading. It's administered every five years and assesses the reading comprehension of students in their fourth year of schooling. We're reporting on the latest year, 2006.
4. The Civic Education Study (CIVED). This exam is an international assessment of the civic knowledge and skills of 14-year olds (eighth and ninth graders). It also examines student attitudes towards democracy and citizenship and willingness to participate in civic activities. We're examining the results from 1999, the last year it was administered.

3 For grade 4, the TIMSS guidelines require that schools test the level in which they have the most 9-year olds. For grade 8, the guidelines require that schools test the level in which they have the most 13-year olds.

In addition, we examine two other indicators: 1) upper secondary (what Americans call high school) graduation rates and 2) the percentage of a country's college-going population that receives bachelor's degrees (international data on this are from 2004).[4]

Drawing from these assessments and indicators, we developed 58 events, each focused on student performance on sub-tests or for sub-groups. Each event was an opportunity to win a gold, silver, or bronze medal; we had a few ties, which resulted in a total of 190 medals.

The top three "medal winners" across all events are Finland (35 medals), Hong Kong (33), and Singapore (16) (see Table i). The United States wins just one medal: a gold for its performance on the Civic Education exam. That gives the U.S. a 20th place finish — below Cyprus, Poland, Slovenia, and the Russian Federation, among others.[5]

Table i
Total Medal Count, by country

	Country	Gold medal count	Silver medal count	Bronze medal count	Total medal count
1	Finland	24	9	2	35
2	Hong Kong	3	18	12	33
3	Singapore	12	3	1	16
4	Republic of Korea	6	5	4	15
5	Japan	2	5	8	15
6	Chinese Taipei[6]	1	3	8	12
7	New Zealand	4	6	1	11
8	Canada	1	1	7	9
9	Estonia	0	6	2	8
10	Australia	1	0	4	5
11	Macao - China	0	0	5	5
12	Liechtenstein	0	1	3	4
13	Russian Federation	2	1	0	3
14	Netherlands	0	2	1	3
15	Cyprus	0	0	3	3
16	Poland	2	0	0	2
17	Greece	0	1	1	2
18	Slovenia (tie)	0	0	2	2
18	United Kingdom (tie)	0	0	2	2

4 Includes graduates of any age for the year 2004 divided by the number of persons at the typical age of graduation for respective countries (generally between ages 22–24).

5 All of the nations in Table 1 typically participate in the athletic Olympics, with the exception of Macao-China.

6 Chinese Taipei is commonly known as Taiwan.

Table i (cont'd)

Total Medal Count, by country

	Country	Gold medal count	Silver medal count	Bronze medal count	Total medal count
20	Norway (tie)	1	0	0	1
20	United States (tie)	1	0	0	1
22	Germany	0	1	0	1
23	Hungary (tie)	0	0	1	1
23	Iceland (tie)	0	0	1	1
	Totals	60	61	69	190

Note: When countries have the same number of medals, the countries with the most gold or silver medals are ranked higher. For instance, Australia and Macao-China both have 5 medals, but Australia has more golds and is ranked higher. In cases where the number and type of medals are the same (e.g., Slovenia and the United Kingdom), the countries tie in rank.

In terms of specific events, U.S. performance is lagging overall. But a few events are particularly depressing. Our fifteen-year-olds finish 30th out of 41 countries in their problem solving abilities (according to PISA 2003 results) and 31st out of 57 countries in their ability to explain various phenomena in scientific terms (PISA 2006 results). The U.S. places 38th out of 57 countries in terms of getting these same youngsters over PISA's most basic achievement level in science. And our low high school graduation rate lands us in eighteenth place out of 24 countries (according to 2004 OECD data).

Chapter 1

Tally Of Medal Winners

This chapter presents a summary of the "events" comprising our Education Olympics web competition (www.edolympics.net). For clarity, we've clustered them together by the assessment from which they were drawn. The events include medal winners from PISA 2003 and 2006, TIMSS 2003, PIRLS 2006, and CIVED 1999 assessments, as well as two additional indicators (high school graduation rates and the percentage of a country's college-going population obtaining bachelor's degrees).

Note this important caveat: When we examine results from international assessments, we must keep in mind that they are sample studies. In other words, the average scores of the student populations tested are only estimates of what the scores would have been if all the students in the country within the targeted population had been tested. Because they are estimates, a margin of error is involved. Consequently, when one country's estimated score is higher than another's (or higher than the international average), we cannot say with certainty that this difference in scores would have been identical had all students been tested. To surmount this analytic hurdle, researchers typically establish levels of statistical significance and say that one country is higher or lower than another (or than the international average) only when the difference is statistically significant. So, when the data are presented, nations are typically grouped into broad bands according to whether their performance is higher than, not significantly different from, or lower than that of the U.S. (see tables in Chapter 2 for this type of display).

To rank countries without using these criteria is potentially misleading. We acknowledge this; a score of 564 for one country and a score of 565 for another doesn't necessarily mean that the latter country is ranked higher than the former. Yet we do rank in this report. We wanted our Education Olympics to mirror the real Olympics and we needed individual standings. And we don't intend this report to be a full-fledged scholarly analysis of international data; there are plenty of those (see our References page). So we ask that you view these rankings in the manner in which we've intended — as a user-friendly snapshot, not a bullet-proof statistical exercise.

That said, Table 1 presents the total medal count by country. Nations winning no medals are not included here but are listed in the appendix (see Table A-1). The rankings are determined by the number of medals awarded to each nation. There are a total of 58 medal events and 77 participating nations. Keep in mind that all 77 nations did not participate in every assessment (see Chapter 2 for participation data), so the rankings are partly a product of how active countries choose to be in these several international assessments in various years.

Table 1
Total Medal Count, by country

	Country	Gold medal count	Silver medal count	Bronze medal count	Total medal count
1	Finland	24	9	2	35
2	Hong Kong SAR	3	18	12	33
3	Singapore	12	3	1	16
4	Republic of Korea	6	5	4	15
5	Japan	2	5	8	15

Connected To What Effect?

Many top-performing nations report that the majority of their schools have internet access. In New Zealand, for example, 95% of schools have internet access — similar to the Netherlands (95%), Hong Kong (90%), and Singapore (93%). In the U.S., 97% of schools are connected to the internet (only a couple Canadian provinces and England have higher percentages). Clearly, we're not the only country that's spent loads of money bridging the technological divide in recent decades. It's unclear, however, if other top performing nations utilize this resource better than we do and, if so, how.

Source: PIRLS 2006 International Report

Table 1 (cont'd)
Total Medal Count, by country

	Country	Gold medal count	Silver medal count	Bronze medal count	Total medal count
6	Chinese Taipei	1	3	8	12
7	New Zealand	4	6	1	11
8	Canada	1	1	7	9
9	Estonia	0	6	2	8
10	Australia	1	0	4	5
11	Macao - China	0	0	5	5
12	Liechtenstein	0	1	3	4
13	Russian Federation	2	1	0	3
14	Netherlands	0	2	1	3
15	Cyprus	0	0	3	3
16	Poland	2	0	0	2
17	Greece	0	1	1	2
18	Slovenia (tie)	0	0	2	2
18	United Kingdom (tie)	0	0	2	2
20	Norway (tie)	1	0	0	1
20	United States (tie)	1	0	0	1
22	Germany	0	1	0	1
23	Hungary (tie)	0	0	1	1
23	Iceland (tie)	0	0	1	1
	Totals	60	61	69	190

Note: When countries have the same number of medals, the countries with the most gold or silver medals are ranked higher. For instance, Australia and Macao-China both have 5 medals, but Australia has more golds and is ranked higher. In cases where the number and type of medals are the same (e.g., Slovenia and the United Kingdom), the countries tie in rank.

Events from the Programme for International Student Assessment (PISA)

Our first set of "events" is drawn from the PISA exam which tests fifteen-year-old students in mathematics, science, and reading literacy.

The events listed in Table 2 show those nations with the most students performing at the top level on PISA (based on 2006 results). In other words, these events look at how many of each nation's students are among the "best and brightest" in the world. The events are divided into overall science performance by gender and by test subsection.

Table 2
Largest percentage of students performing at PISA's top level in science (2006)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Percentage of 15-year-olds at top level in science	New Zealand	Finland	United Kingdom	14
Percentage of 15-year-old females at top level in science	New Zealand	Finland	Liechtenstein	10
Percentage of 15-year-old males at top level in science	Finland	New Zealand	United Kingdom	13
Percentage of 15-year-olds at top level on subtest explaining phenomena scientifically	Finland	New Zealand	Chinese Taipei	14
Percentage of 15-year-olds at top level on subtest identifying scientific issues	New Zealand	Netherlands	Australia	13
Percentage of 15-year-olds at top level on subtest using scientific evidence	New Zealand	Finland	Japan	16

**Total number of countries participating is 57.*

NOTE: PISA scores are reported on a scale from 0 to 1,000 with a mean of 500 and a standard deviation of 100. In order to be deemed a level 6, a student must have scored above 707.93.

Events in Table 3 show those nations with the fewest students performing at the lowest level on PISA in science (based on 2006 results)—which is a good thing. Naturally, some of the same countries that appear in Table 2 also appear in Table 3. The events are divided by overall performance in science by gender and by test subsection.

Table 3

Lowest percentage of students performing at PISA's lowest level in science (2006)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Percentage of 15-year-olds at lowest level in science	Finland	Estonia	Macao - China	38
Percentage of 15-year-old females at lowest level in science	Finland	Estonia	Macao-China	38
Percentage of 15-year-old males at lowest level in science	Finland	Estonia	Macao-China	37
Percentage of 15-year-olds at the lowest level on subtest explaining phenomena scientifically	Finland	Estonia	Hong Kong SAR/ Macao – China tie	38
Percentage of 15-year-olds at the lowest level on subtest identifying scientific issues	Finland	Estonia	Slovenia	31
Percentage of 15-year-olds at the lowest level on subtest using scientific evidence	Finland	Estonia	Macao - China	35

**Total number of countries participating is 57.*

Note: PISA scores are reported on a scale from 0 to 1,000 with a mean of 500 and a standard deviation of 100. In order to be deemed below level 1, a student must have scored less than or equal to 334.94.

Healthy Choice

Top-performing nations, overall, offer at least some degree of school choice. For instance, according to PISA 2006 data, roughly 90% of students in Hong Kong and Australia are enrolled in schools where principals report that two or more schools are competing for students in the same area. Chinese Taipei and Macao-China come in at roughly 80%. Compare that to the roughly 60% of American students experiencing the same. Interestingly, Finland principals report less school choice. Only 40% of students in Finland are enrolled in schools where principals report competing with two or more schools for students in the same area. All our other top medal winners are either roughly equal to or over the OECD average of 60%.

Source: OECD PISA 2006 database, Table 5.5

Events in Table 4 show those nations that have the highest average scores on the problem-solving section of PISA (based on 2003 results).[7] These are the countries whose students do best when it comes to reasoning, deciding, and troubleshooting problems. PISA situates these problems in various contexts, such as personal life, work or leisure, and community settings. The events are divided by overall performance and by gender.

Table 4
Highest average scores on PISA problem solving (2003)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest problem solving score	Republic of Korea	Finland/Hong Kong SAR tie	Japan	30
Highest problem solving score by females	Finland	Hong Kong SAR	Japan	29
Highest problem solving score by males	Republic of Korea	Japan	Hong Kong SAR	30

**Total number of participating countries is 41.*

Note: PISA scores are reported on a scale from 0 to 1,000 with a mean of 500 and a standard deviation of 100.

Events in Table 5 show those nations that have the highest average scores on the reading literacy section of PISA (based on 2003 results). These are the nations whose students do the best in terms of understanding and using written information for a variety of purposes. PISA uses multiple sources to assess literacy skills including narrative, descriptive, and expository writing, as well as charts, tables, and maps. Events are divided by overall combined performance and by gender.

Table 5
Highest average scores on PISA reading literacy (2003)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest overall reading literacy score	Finland	Republic of Korea	Canada	19
Highest reading literacy score by females	Finland	Republic of Korea	Canada	20
Highest reading literacy score by males	Republic of Korea	Finland	Liechtenstein	16

**Total number of participating countries is 41.*

Note: PISA scores are reported on a scale from 0 to 1,000 with a mean of 500 and a standard deviation of 100.

7 Problem solving is assessed separately from math and science in PISA.

Events in Table 6 show those nations that have the highest average scores on the mathematics literacy section of PISA (based on 2003 and 2006 results). [Overall score is from 2006. Male/female scores from 2006 were not readily available, so those are from 2003.] These are the countries whose students do the best at formulating, solving, and interpreting math problems. PISA typically situates these problems in real-world settings such as those encountered when shopping, travelling, cooking, or handling personal finances. Events are divided by overall performance and by gender.

Table 6
Highest average scores on PISA mathematics literacy (2003 and 2006)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest overall mathematics literacy score (2006)	Chinese Taipei	Finland	Republic of Korea/ Hong Kong SAR tie	35
Highest math literacy score by females (2003)	Hong Kong SAR	Finland	Netherlands	29
Highest math literacy score by males (2003)	Republic of Korea/ Hong Kong SAR tie	Liechtenstein	Finland	28

**Total number of countries participating is 57 in 2006 and 41 in 2003. Overall math scores are from 2006. Scores disaggregated by gender are from 2003.*

Note: PISA scores are reported on a scale from 0 to 1,000 with a mean of 500 and a standard deviation of 100.

Events in Table 7 show those nations that have the highest average scores on the science literacy section of PISA (based on 2006 results). These are the countries whose students do exceptionally well at retaining scientific facts and terms, understanding fundamental scientific concepts, and recognizing the limits of scientific knowledge. Events are divided by overall performance, performance by gender, and performance of first-generation immigrant students.

Table 7
Highest average scores on PISA science literacy (2006)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest overall science literacy score	Finland	Hong Kong SAR	Canada	29
Highest science literacy scores of first-generation immigrant students	Australia	New Zealand	Hong Kong SAR	16

Table 7 (cont'd)

Highest average scores on PISA science literacy (2006)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest science literacy score by females	Finland	Hong Kong SAR	Estonia	30
Highest science literacy score by males	Finland	Hong Kong SAR	Canada/Chinese Taipei tie	30

**Total number of countries participating is 57, except for the first-generation immigrant event. For the latter, the total is 23, since three percent of the total population had to qualify as first-generation immigrants in order for their scores to be counted separately.*

Note: PISA scores are reported on a scale from 0 to 1,000 with a mean of 500 and standard deviation of 100.

Events in Table 8 show those nations that have the highest average scores on the PISA subtest that measures students' ability to explain phenomena scientifically. These are the countries, for example, whose students do very well applying their knowledge of science to a given situation. Event results (drawn from 2006 PISA) are divided by overall performance and gender.

Table 8

Highest average scores on PISA subtest, explaining phenomena scientifically (2006)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest overall score on subtest explaining phenomena scientifically	Finland	Hong Kong SAR	Chinese Taipei	31
Highest scores on subtest by females	Finland	Hong Kong SAR	Estonia	32
Highest scores on subtest by males	Finland	Hong Kong SAR	Chinese Taipei	32

**Total number of participating countries is 57.*

Note: PISA scores are reported on a scale from 0 to 1,000 with a mean of 500 and a standard deviation of 100.

Events in Table 9 show those nations that have the highest average scores on the PISA subtest that measures students' ability to identify scientific issues. These are the countries whose students do well, for example, knowing and recognizing what types of questions can be investigated scientifically. Event results (drawn from 2006 PISA) are divided by overall performance and gender.

Table 9

Highest average scores on PISA subtest, identifying scientific issues (2006)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest overall score on subtest identifying scientific issues	Finland	New Zealand	Australia	25
Highest scores on subtest by females	Finland	New Zealand	Australia	26
Highest scores on subtest by males	Finland	Netherlands	Australia/Canada/ New Zealand tie	23

**Total number of participating countries is 57.*

Note: PISA scores are reported on a scale from 0 to 1,000 with a mean of 500 and a standard deviation of 100.

Events in Table 10 show those nations that have the highest average scores on the PISA subtest that measures students' ability to use scientific evidence. In other words, these are the countries whose students are best able to make sense of scientific findings, distinguishing between real evidence and false claim. Event results (drawn from 2006 PISA) are divided by overall performance and gender.

Table 10

Highest average scores on PISA subtest, using scientific evidence (2006)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest overall score on subtest using scientific evidence	Finland	Japan	Canada/Hong Kong SAR	29
Highest overall score on subtest by females	Finland	Japan	Liechtenstein	29
Highest score on subtest by males	Finland	Hong Kong SAR	Japan	29

**Total number of participating countries is 57.*

Note: PISA scores are reported on a scale from 0 to 1,000 with a mean of 500 and standard deviation of 100.

Events from the Trends in International Mathematics and Science Study (TIMSS)

Our second set of "events" is drawn from the TIMSS, which tests students in grade four and eight in mathematics and science.[8]

Events in Table 11 show those nations that have the highest average scores in fourth-grade math (based on 2003 results). These are the countries whose youngsters do best overall in the subject, as well as in specific math areas like patterns and relationships, data, geometry, measurement, and numbers. Events are divided by overall performance, performance by gender, and performance by test subsection.

Table 11
Highest 4th-grade average math performance (2003)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest 4th-grade math scores overall	Singapore	Hong Kong SAR	Japan	12
Highest 4th-grade math scores by males	Singapore	Hong Kong SAR	Japan	8
Highest 4th-grade math scores by females	Singapore	Hong Kong SAR	Japan	8
Highest 4th-grade math scores in 'Data' content	Japan	Singapore	Chinese Taipei	7
Highest 4th-grade math scores in 'Geometry'	Singapore	Japan	Hong Kong SAR	13
Highest 4th-grade math scores in 'Measurement'	Japan	Singapore	Hong Kong SAR	17
Highest 4th-grade math scores in the 'Number' content area	Singapore	Hong Kong SAR	Chinese Taipei	12
Highest 4th-grade math scores in 'Patterns & Relationships'	Singapore	Hong Kong SAR	Chinese Taipei	11

**Total number of participating countries is 25, except for male and female scores, where it is 15.*

Note: TIMSS data are scored on a scale using an IRT model to determine proficiency benchmarks relative to international averages.

Plump Class Sizes

The small class–size movement has had a harder time gaining ground in top-performing nations than it has here in the U.S. New Zealand's average class size in reading and language instruction is 27 students, while Chinese Taipei and Hong Kong come in at 32 and 35 students, respectively. However, the hefty class-size winner is Singapore, which has a robust average of 38 students per class. The U.S. has 23 students on average per class, while Luxembourg has only 17.

Source: PIRLS 2006 International Report

8 For grade 4, the TIMSS guidelines require that schools test the level in which they have the most 9-year olds. For grade 8, the guidelines require that schools test the level in which they have the most 13-year olds.

Events in Table 12 show those nations with the highest average scores in eighth-grade math (based on 2003 results). These are the countries whose adolescents do best overall in the subject, as well in the specific math areas like algebra and geometry. Events are divided by overall performance, performance by gender, and performance by test subsection.

Table 12
Highest 8th-grade average math performance (2003)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest 8th-grade math scores overall	Singapore	Republic of Korea	Hong Kong SAR	15
Highest 8th-grade math scores by females	Singapore	Chinese Taipei	Hong Kong SAR	14
Highest 8th-grade math scores by males	Singapore	Republic of Korea	Hong Kong SAR	12
Highest 8th-grade math scores in 'Algebra'	Republic of Korea	Singapore	Chinese Taipei	11
Highest 8th-grade math scores in 'Data' content	Singapore	Japan	Republic of Korea	12
Highest 8th-grade math scores in 'Geometry'	Republic of Korea	Chinese Taipei	Hong Kong SAR/ Japan tie	23
Highest 8th-grade math scores in 'Measurement'	Singapore	Hong Kong SAR	Republic of Korea	20
Highest 8th-grade math scores in the 'Number' content area	Singapore	Hong Kong SAR	Republic of Korea/ Chinese Taipei tie	12

**Total number of countries participating is 45, except for male and female scores, when it is 34. Some countries did not disaggregate by gender or did not have sufficient participation to disaggregate by gender and retain statistical strength.*

Note: TIMSS data are scored on a scale using an IRT model to determine proficiency benchmarks relative to international averages.

Events from the Progress in International Reading Literacy Study (PIRLS)

Our third set of "events" is drawn from the PIRLS, which tests students in reading comprehension in their fourth year of schooling.

Events in Table 13 show those nations that have the highest average scores on PIRLS overall and by subtest (based on 2006 results). These are the countries whose students did exceptionally well with various comprehension skills, such as retrieving and focusing on specific ideas, making simple and complex inferences, and examining and evaluating text features.

Table 13
PIRLS performance (2006)

Event	Medals			US Rank
	Gold	Silver	Bronze	
Highest score overall on reading literacy	Russian Federation	Hong Kong SAR	Canada (Alberta)	18
Highest score on PIRLS informational subtest	Hong Kong SAR	Russian Federation	Singapore	19
Highest score on PIRLS literacy subtest	Canada (Alberta)/ Russian Federation tie	Canada (British Columbia)	Hong Kong SAR/ Hungary	18

**Total number of participating countries is 45.*

Note: PIRLS scores are reported on a scale from 0 to 1,000 with a mean of 500 and a standard deviation of 100. PIRLS is the only international assessment in which Canada's provinces competed separately.

Stress-Free Finnish Principals

Finland's school principals appear to benefit from the good reputations of their schools, at least in terms of parental pressure (or lack thereof). In fact, roughly 78% of Finnish students are in schools where principals report that, regarding academic standards, pressure from parents is largely absent. Just 17% of U.S. students find themselves in a similar situation (the OECD average is roughly 22%). On the other end of the spectrum, moderate numbers of students are enrolled in schools where principals say "there is constant pressure from many parents" regarding high academic standards. These include New Zealand (43%), Japan (39%), the U.S. (35%), and Canada (32%).

Source: OECD PISA 2006 database, Table 5.6

Events from the Civic Education Study (CIVED)

Our fourth set of "events" is drawn from the Civic Education Study. This assessment tests fourteen-year-olds on their civic knowledge and skills, as well as attitudes towards citizenship. It was last administered in 1999.

Events in Table 14 show those nations with the highest average scores. Events include overall scores, as well as by content and skill areas. Students in these countries did well, for example, identifying key features of democracies and understanding political articles and political cartoons.

Table 14
CIVED performance (1999)

Event	Medals			U.S. Rank
	Gold	Silver	Bronze	
Highest 9th-grade scores on overall civic knowledge	Poland	Finland	Cyprus/Greece tie	6
Highest 9th-grade scores on civic content subtest	Poland	Greece	Finland/Cyprus/ Hong Kong SAR tie	10
Highest 9th-grade scores on civic skills subtest	United States	Finland	Cyprus	1

**Total number of participating countries is 28.*

Note: The international mean for the CIVED is set at 100, with a standard deviation of 20.

Events from Other Data Sources

Our final set of "events" involves academic completion rates. The results are based upon 2004 data from the Organisation for Economic Cooperation and Development (OECD).

The event in Table 15 shows those nations that have the greatest percentage of their total upper secondary education population (high school students) graduating.

Table 15
High school graduation rates (2004)

Event	Medals			US Rank
	Gold	Silver	Bronze	
Upper secondary graduation rate	Norway	Germany	Republic of Korea	18

**Total number of participating countries is 24.*

The event in Table 16 shows those nations that have the greatest percentage of their total college-going population receiving bachelor's degrees (at any age) for the year 2004.

Table 16
Greatest percentage of undergraduate degrees (2004)

Event	Medals			US Rank
	Gold	Silver	Bronze	
Bachelor's degree recipients	Finland	New Zealand	Iceland	11

**Total number of participating countries is 19.*

Note: Includes graduates of any age for the year 2004 divided by the number of persons at the typical age of graduation for respective countries (generally between ages 22-24).

A complete list with the U.S. performance on all 58 medal events can be found in the appendix (Table A-2).

Chapter 2
International Assessments and Results

This chapter provides a brief description of the international assessments reported in Chapter 1. We also include the nations that participated in each assessment for the year(s) examined and summary achievement data by country. Unlike the medal events in Chapter 1, however, we report international data in this section consistent with how it's reported by the National Center for Education Statistics (NCES) and the Organisation for Economic Co-operation and Development (OECD).

PISA

The Programme for International Student Assessment (PISA) is an internationally standardized assessment that was jointly developed by participating countries and administered to fifteen-year-olds in schools. The test is carried out and overseen by the OECD. The assessment essentially asks what can students do with the mathematics and science that they have learned? It measures students' ability to apply what they have learned to real-world situations and to communicate solutions to others. Unlike the TIMSS, PISA is not tied to curriculum or schooling per se. Rather, it "move[s] beyond the school-based approach towards the use of knowledge in everyday tasks and challenges."[9] The three primary domains assessed are mathematical literacy, scientific literacy, and problem solving.

Like the TIMSS, the countries choosing to participate vary each time PISA is administered. The testing cycle is every three years and the tests are typically administered to between 4,500 and 10,000 students in each country. We present data from both the 2003 and 2006 (the latest) administration of PISA. Forty-one countries participated in 2003 and 57 countries did so in 2006.

In all PISA cycles, the domains of reading, mathematical, and science literacy are assessed. The main focus of PISA 2003 was mathematical literacy and problem solving. For PISA 2006, the focus was on scientific literacy.

Tables 17 and 18 present the average scores for PISA 2006 math literacy and science literacy. As shown in Table 17, 31 nations have statistically higher math averages than the United States, including Finland, Canada, Denmark, and Iceland. Plus, the U.S. average of 474 is lower than the OECD average of 498.

The picture for science (Table 18) is much the same. Twenty-two nations have statistically higher science averages than the U.S. The U.S. average (489) is below the OECD average (500).

Table 17
Average PISA math literacy scores (2006)

Country	Average Math Literacy: 2006
OECD Average	**498**
Chinese Taipei*	549
Finland	548
Korea, Republic of/Hong Kong SAR*	547
Netherlands	531
Switzerland	530

9 PISA 2003 Assessment Framework, OECD, pg. 10.

Table 17 (cont'd)
Average PISA math literacy scores (2006)

Country	Average Math Literacy: 2006
OECD Average	**498**
Canada	527
Macao-China*/Liechtenstein*	525
Japan	523
New Zealand	522
Belgium/Australia	520
Estonia*	515
Denmark	513
Czech Republic	510
Iceland	506
Austria	505
Germany/Slovenia*	504
Sweden	502
Ireland	501
France	496
United Kingdom/Poland	495
Slovak Republic	492
Hungary	491
Luxembourg/Norway	490
Lithuania*/Latvia*	486
Spain	480
Azerbaijan*/Russian Federation*	476
United States	**474**
Croatia*	467
Portugal	466
Italy	462
Greece	459
Israel*	442
Republic of Serbia*[1]	435
Uruguay*	427
Turkey	424
Thailand*	417

Table 17 (cont'd)

Average PISA math literacy scores (2006)

Country	Average Math Literacy: 2006
OECD Average	**498**
Romania*	415
Bulgaria*	413
Chile*	411
Mexico	406
Republic of Montenegro*[1]	399
Indonesia*	391
Jordan*	384
Argentina*	381
Colombia*/Brazil*	370
Tunisia*	365
Qatar*	318
Kyrgyz Republic*	311

Source: Highlights from PISA 2006: Performance of U.S. 15-Year-Old Students in Science and Mathematics Literacy in an International Context, NCES, 2007.

**Denotes non-OECD country*

1 Serbia and Montenegro were reported as one country in 2003 and as two countries in 2006

Average is higher than U.S. Average

Average is not measurably different from U.S. Average

Average is lower than U.S. Average

Table 18

Average PISA science literacy scores (2006)

Country	Average Science Literacy: 2006
OECD Average	**500**
Finland	563
Hong Kong SAR *	542
Canada	534
Chinese Taipei*	532
Japan/Estonia*	531
New Zealand	530
Australia	527
Netherlands	525
Korea, Republic of/Liechtenstein*	522

Per-Pupil Figures

The U.S. ranks second (out of 24 OECD countries) in terms of highest per-pupil expenditures with an average of $7,574 spent in 2001. Only Denmark spends more at $7,708. Finland (ranked 10th) and Japan (ranked 11th) fall in the middle, at $5,681 and $5,654 respectively—just slightly above the OECD average ($5,302). High-achieving Korea spends among the lowest at only $3,357 per student (it's 19th in spending). Spending even less per student are Greece ($2,596), Hungary ($2,492), Slovak Republic ($1,656), and Mexico—which is ranked last at a meager expenditure of $1,373 per student.

Source: International Comparison of Educational Indicators 2005

Table 18 (cont'd)
Average PISA science literacy scores (2006)

Country	Average Science Literacy: 2006
OECD Average	**500**
Slovenia*	519
Germany	516
United Kingdom	515
Czech Republic	513
Switzerland	512
Austria/Macao-China*	511
Belgium	510
Ireland	508
Hungary	504
Sweden	503
Poland	498
Denmark	496
France	495
Croatia*	493
Iceland	491
Latvia*	490
United States	**489**
Slovak Republic/Lithuania*/Spain	488
Norway	487
Luxembourg	486
Russian Federation*	479
Italy	475
Portugal	474
Greece	473
Israel*	454
Chile*	438
Republic of Serbia*[1]	436
Bulgaria*	434
Uruguay*	428
Turkey	424
Jordan*	422

Table 18 (cont'd)
Average PISA science literacy scores (2006)

Country	Average Science Literacy: 2006
OECD Average	**500**
Thailand*	421
Romania*	418
Republic of Montenegro*[1]	412
Mexico	410
Indonesia*	393
Argentina*	391
Brazil*	390
Colombia*	388
Tunisia*	386
Azerbaijan*	382
Qatar*	349
Kyrgyz Republic*	322

Source: Highlights from PISA 2006: Performance of U.S. 15-Year-Old Students in Science and Mathematics Literacy in an International Context, NCES, 2007.

**Denotes non-OECD country*

1 Serbia and Montenegro were reported as one country in 2003 and as two countries in 2006

Average is higher than U.S. Average

Average is not measurably different from U.S. Average

Average is lower than U.S. Average

Tables 19 and 20 present the average scores for PISA 2003 reading literacy and problem solving. As shown in Table 19, twelve nations score statistically higher than the U.S. in reading literacy. These include Finland, Canada, Sweden, and Belgium. The U.S. average (495) is barely above the international average (494).

Twenty-six nations score statistically higher than the U.S. in terms of their problem solving prowess (Table 20). These include France, Germany, Ireland, and Poland. The U.S. average (477) is below the OECD average (500).

Table 19
Average PISA reading literacy scores (2003)

Country	PISA Average Reading Literacy: 2003
OECD Average	**494**
Finland	543
Korea, Republic of	534
Canada	528

Table 19 (cont'd)
Average PISA reading literacy scores (2003)

Country	PISA Average Reading Literacy: 2003
OECD Average	**494**
Australia/Liechtenstein	525
New Zealand	522
Ireland	515
Sweden	514
Netherlands	513
Hong Kong SAR*	510
Belgium/United Kingdom	507
Norway	500
Switzerland	499
Japan, Macao-China*	498
Poland	497
France	496
United States	**495**
Denmark/Iceland	492
Germany/Austria/Latvia*	491
Czech Republic	489
Hungary	482
Spain	481
Luxembourg	479
Portugal	478
Italy	476
Greece	472
Slovak Republic	469
Russian Federation*	442
Turkey	441
Uruguay*	434
Thailand*	420
Serbia and Montenegro*[1]	412
Brazil*	403
Mexico	400
Indonesia*	382

Table 19 (cont'd)
Average PISA reading literacy scores (2003)

Country	PISA Average Reading Literacy: 2003
OECD Average	**494**
Tunisia*	375

Source: PISA 2003 Country Profiles, OECD, available at http://pisacountry.acer.edu.au/.

**Denotes non-OECD country*

The following non-OECD countries that participated in 2006 did not participate in 2003: Argentina, Azerbaijan, Chile, Chinese-Taipei, Colombia, Croatia, Estonia, Israel, Lithuania, Qatar, Romania, and Slovenia

1 Serbia and Montenegro were reported as one country in 2003 and as two countries in 2006

Average is higher than U.S. Average

Average is not measurably different from U.S. Average

Average is lower than U.S. Average

Table 20
Average PISA problem solving scores (2003)

Country	PISA Average Problem Solving Scores: 2003
OECD Average	**500**
Korea, Republic of	550
Hong Kong SAR*/Finland	548
Japan	547
New Zealand	533
Macao-China*	532
Australia	530
Canada/Liechtenstein*	529
Belgium	525
Switzerland	521
Netherlands	520
France	519
Denmark	517
Czech Republic	516
Germany	513
United Kingdom	510
Sweden	509
Austria	506
Iceland	505

Japanese Humility, American Brashness, Finnish Reality

Japanese children apparently think less of their science abilities than do American children. Though they have a higher mean performance in science, fewer of them report high levels of self-efficacy in science. Contrast this with U.S. pupils, who score lower on international science assessments yet report that they can do various scientific tasks "easily or with a bit of effort." Finland is the highest performer on PISA science measures and many students report self-efficacy in science; in other words, the thoughts that Finnish children have about their science abilities match their know-how.

Source: OECD PISA 2006 database, Tables 3.3 and 2.1c

Table 20 (cont'd)

Average PISA problem solving scores (2003)

Country	PISA Average Problem Solving Scores: 2003
OECD Average	**500**
Hungary	501
Ireland	498
Luxembourg	494
Slovak Republic	492
Norway	490
Poland	487
Latvia*	483
Spain	482
Russian Federation*	479
United States	**477**
Portugal/Italy	470
Greece	449
Thailand*	425
Serbia and Montenegro*[1]	420
Uruguay*	411
Turkey	408
Mexico	384
Brazil*	371
Indonesia*	361
Tunisia*	345

Source: International Outcomes of Learning in Mathematics Literacy and Problem Solving: PISA 2003 Results from the U.S. Perspective, NCES, 2004.

**Denotes non-OECD country*

The following non-OECD countries that participated in 2006 did not participate in 2003: Argentina, Azerbaijan, Chile, Chinese-Taipei, Colombia, Croatia, Estonia, Israel, Lithuania, Qatar, Romania, and Slovenia

1 Serbia and Montenegro were reported as one country in 2003 and as two countries in 2006

Average is higher than U.S. Average

Average is not measurably different from U.S. Average

Average is lower than U.S. Average

In short, the United States consistently underperforms internationally on the PISA math, science, reading, and problem solving measures. And, unlike on the TIMSS and PIRLS measures, we typically score below the international average. Both our economic peers (such as Japan, France, and the United Kingdom) and our non-economic competitors (such as Slovenia, Latvia, and Lithuania) significantly outperform us in one or more of these areas.

TIMSS

The Trends in International Mathematics and Science Study (TIMSS) is an international study that addresses the knowledge and skills that students have acquired by grades four and eight in mathematics and science. The test is administered every four years with variation in the grade and age levels tested. The countries choosing to participate may also be different for different administrations of the test. The year for which we report, 2003, is the third (and latest) comparison of mathematics and science achievement carried out since 1995 by the International Association for the Evaluation of Educational Achievement (IEA), an international organization of national research institutions and governmental research agencies.[10] For the 2003 administration, 25 countries participated at grade four and 45 countries participated at grade eight.

TIMSS can be used to track changes in achievement over time. Unlike PISA, it is closely linked to the curricula of the participating countries, providing an indication of the degree to which students have learned concepts in mathematics and science they have encountered in school. TIMSS also includes survey data and classroom video data which measure what is taught and how in a sample of countries.

Tables 21 and 22 present the average scale scores for fourth-grade math and science. As shown in Table 21, eleven nations have statistically higher math averages than the U.S.; however, the U.S. average of 518 is above the international average of 495.

One of our best performances is in fourth-grade math (Table 22). Only three nations score statistically higher than the U.S. (Singapore, Chinese Taipei, and Japan). Our 536 average is higher than the 489 international average.

Table 21
Average 4th-grade math scores (2003)

Country	4th-Grade Math
International Average	**495**
Singapore	594
Hong Kong SAR	575
Japan	565
Chinese Taipei	564
Belgium (Flemish)	551
Netherlands	540
Latvia	536
Lithuania	534
Russian Federation	532
England	531
Hungary	529
United States	**518**
Cyprus	510
Moldova, Republic of	504

10 Data from the 2007 TIMSS are not yet available. They are scheduled to be released in December 2008.

Table 21 (cont'd)
Average 4th-grade math scores (2003)

Country	4th-Grade Math
International Average	**495**
Italy	503
Australia	499
New Zealand	493
Scotland	490
Slovenia	479
Armenia	456
Norway	451
Iran, Islamic Republic of	389
Philippines	358
Morocco	347
Tunisia	339

Source: Highlights from the TIMSS 2003, NCES, 2004.

Note: The following countries chose not to participate in fourth-grade math for 2003 (just eighth-grade math): Bahrain, Botswana, Bulgaria, Chile, Egypt, Estonia, Ghana, Indonesia, Israel, Jordan, Republic of Korea, Lebanon, Republic of Macedonia, Malaysia, Palestinian National Authority, Romania, Saudi Arabia, Serbia, Slovak Republic, South Africa, Sweden.

Average is higher than U.S. Average

Average is not measurably different from U.S. Average

Average is lower than U.S. Average

Table 22
Average 4th-grade science scores (2003)

Country	4th-Grade Science
International Average	**489**
Singapore	565
Chinese Taipei	551
Japan	543
Hong Kong SAR	542
England	540
United States	**536**
Latvia	532
Hungary	530
Russian Federation	526

Table 22 (cont'd)
Average 4th-grade science scores (2003)

Country	4th-Grade Science
International Average	**489**
Netherlands	525
Australia	521
New Zealand	520
Belgium(Flemish)	518
Italy	516
Lithuania	512
Scotland	502
Moldova, Republic of	496
Slovenia	490
Cyprus	480
Norway	466
Armenia	437
Iran, Islamic Republic of	414
Philippines	332
Tunisia	314
Morocco	304

Source: Highlights from the TIMSS 2003, NCES, 2004.

Note: The following countries chose not to participate in fourth-grade science for 2003 (just eighth-grade science): Bahrain, Botswana, Bulgaria, Chile, Egypt, Estonia, Ghana, Indonesia, Israel, Jordan, Republic of Korea, Lebanon, Republic of Macedonia, Malaysia, Palestinian National Authority, Romania, Saudi Arabia, Serbia, Slovak Republic, South Africa, Sweden

Average is higher than U.S. Average

Average is not measurably different from U.S. Average

Average is lower than U.S. Average

Tables 23 and 24 present the average scale scores for eighth-grade math and science. In math, nine nations score significantly higher than the U.S., though our 504 average is higher than the international average (466). The story is similar for eighth-grade science (Table 24) where seven nations have statistically higher averages, though our average (527) is again higher than the international average (473).

Table 23
Average 8th-grade math scores (2003)

Country	8th-Grade Math
International Average	**466**
Singapore	605

Longitudinal Data, Anyone?

New Zealand has a highly developed and centralized digital system for monitoring students in the public primary, secondary, and post-secondary system. All students are assigned a National Student Number (NSN) in elementary school. Mostly used in conjunction with high school graduation exams and application to universities, it's a unique identifier somewhat like the American Social Security number. It's only used, however, to track educational information in a way that safeguards students' privacy.

Source: New Zealand Ministry of Education

Table 23 (cont'd)
Average 8th-grade math scores (2003)

Country	8th-Grade Math
International Average	**466**
Korea, Republic of	589
Hong Kong SAR	586
Chinese Taipei	585
Japan	570
Belgium (Flemish)	537
Netherlands	536
Estonia	531
Hungary	529
Malaysia/Latvia/ Russian Federation/ Slovak Republic	508
Australia	505
United States	**504**
Lithuania	502
Sweden	499
Scotland	498
Israel	496
New Zealand	494
Slovenia	493
Italy	484
Armenia	478
Serbia	477
Bulgaria	476
Romania	475
Norway	461
Moldova, Republic of	460
Cyprus	459
Macedonia, Republic of	435
Lebanon	433
Jordan	424
Indonesia/Iran, Islamic Republic of	411
Tunisia	410
Egypt	406

Table 23 (cont'd)

Average 8th-grade math scores (2003)

Country	8th-Grade Math
International Average	**466**
Bahrain	401
Palestinian National Authority	390
Chile/Morocco	387
Philippines	378
Botswana	366
Saudi Arabia	332
Ghana	276
South Africa	264

Source: Highlights from the TIMSS 2003, NCES, 2004.

Average is higher than U.S. Average

Average is not measurably different from U.S. Average

Average is lower than U.S. Average

Table 24

Average 8th-grade science scores (2003)

Country	8th-Grade Science
International Average	**473**
Singapore	578
Chinese Taipei	571
Korea, Republic of	558
Hong Kong SAR	556
Estonia/Japan	552
Hungary	543
Netherlands	536
United States/Australia	**527**
Sweden	524
Slovenia/New Zealand	520
Lithuania	519
Slovak Republic	517
Belgium (Flemish)	516
Russian Federation	514

Table 24 (cont'd)
Average 8th-grade science scores (2003)

Country	8th-Grade Science
International Average	**473**
Latvia/Scotland	512
Malaysia	510
Norway	494
Italy	491
Israel	488
Bulgaria	479
Jordan	475
Moldova, Republic of	472
Romania	470
Serbia	468
Armenia	461
Iran, Islamic Republic of	453
Macedonia, Republic of	449
Cyprus	441
Bahrain	438
Palestinian National Authority	435
Egypt	421
Indonesia	420
Chile	413
Tunisia	404
Saudi Arabia	398
Morocco	396
Lebanon	393
Philippines	377
Botswana	365
Ghana	255
South Africa	244

Source: Highlights from the TIMSS 2003, NCES, 2004.

Average is higher than U.S. Average

Average is not measurably different from U.S. Average

Average is lower than U.S. Average

When Will Johnny Carry A Lunchbox?

The international community, like the continental U.S., differs in when it thinks it's appropriate for children to start school. For example, compulsory education doesn't start until age seven in Bulgaria, Estonia, Denmark, and Finland. By contrast, children in England, the Netherlands, and Scotland must start school at age five. In the U.S., compulsory starting ages range from age five in New Mexico to age eight in Washington.

Source: Department of Education, NCES, Digest of Education Statistics, 2004; UK National Foundation for Educational Research, School Starting Age: European Policy and Recent Research, 2002

In short, the U.S. trails on TIMMS many (but not all) other nations which are considered our economic peers (or rivals, some would say). Many will point out, however, that we score above the international average on the TIMSS measures. And while that's true, it's important to remember that averages are drastically lowered by developing nations (such as Ghana, Egypt, South Africa, and Botswana).

PIRLS

The Progress in International Reading Literacy Study (PIRLS) is an international assessment of trends in primary school reading. It is administered every five years and assesses the reading comprehension of students in their fourth year of schooling. In 2006, PIRLS was conducted in 40 countries. (Considering Belgium's two education systems and Canada's five participating provinces, that makes for 45 participants.) The sample included a nationally representative sample of fourth-grade students in the United States.

The PIRLS assessment measures student performance on a combined reading literacy scale and on literary and informational subscales. The former uses narrative fiction to assess students' abilities to read and understand literature. The latter uses a variety of informational texts to assess students' abilities to acquire and use information while reading. PIRLS 2006 also gathered information about classrooms and schools via student, teacher, and principal questionnaires.

Table 25 presents the average combined literacy scores for fourth-grade students. As shown, ten nations (or provinces) score statistically higher than the U.S., including Hong Kong, Sweden, and Italy. The U.S. literacy average of 540, however, is higher than the international average of 500.

Table 25
Average combined literacy scores (2006)

Country/Region	PIRLS Average Combined Reading Literacy Score: 2006
International Average	**500**
Russian Federation	565
Hong Kong SAR	564
Canada, Alberta	560
Canada, British Columbia/Singapore	558
Luxembourg	557
Canada, Ontario	555
Hungary/Italy	551
Sweden	549
Germany	548
Belgium (Flemish)/Bulgaria/Netherlands	547
Denmark	546
Canada, Nova Scotia	542
Latvia	541
United States	**540**
England	539
Austria	538
Lithuania	537
Chinese Taipei	535

Table 25 (cont'd)
Average combined literacy scores (2006)

Country/Region	PIRLS Average Combined Reading Literacy Score: 2006
International Average	**500**
Canada, Quebec	533
New Zealand	532
Slovak Republic	531
Scotland	527
France/Slovenia	522
Poland	519
Spain	513
Israel	512
Iceland	511
Belgium (French)/Moldova, Republic of	500
Norway	498
Romania	489
Georgia	471
Macedonia	442
Trinidad and Tobago	436
Iran, Islamic Republic of	421
Indonesia	405
Qatar	353
Kuwait	330
Morocco	323
South Africa	302

Source: The Reading Literacy of U.S. Fourth-Grade Students in an International Context, NCES, 2007.

Average is higher than U.S. Average

Average is not measurably different from U.S. Average

Average is lower than U.S. Average

Once again, the U.S. trails some of our economic peers, this time in reading literacy. But we also outperform some of them, including New Zealand, France, and Norway.

Veterans Fare Better In Japan

Teachers' starting and mid-career salaries show somewhat reversed trends in the U.S. and Japan. According to 2004 data, Japan pays its primary teachers an average starting salary of only $24,500 while the U.S. pays an average of $32,700. After fifteen years of teaching, Japan's average teacher's salary rises to $45,800, while fifteen-year veterans in the U.S. are paid an average of $39,700.

Source: Comparative Indicators of Education in the United States and Other G-8 Countries: 2006

Civic Education Study (CIVED)

The Civic Education Study is an international assessment of the civic knowledge and skills of fourteen-year-olds (eighth and ninth graders) in 28 countries. It also examines student attitudes toward democracy and citizenship and willingness to participate in civic activities. The assessment is not designed to measure knowledge of a particular country's government but measures knowledge and understanding of key civic principles that are universal across democracies.

Like TIMSS, the assessment is carried out by the International Association for the Evaluation of Educational Achievement (IEA), an international organization of national research institutions and governmental research agencies. The 1999 Civic Education Study was the first IEA study in this subject area since 1971. Roughly 90,000 fourteen-year-old students from 28 countries participated, as well as thousands of their teachers and principals (through separate questionnaires). To our knowledge, there are no present plans to re-administer the CIVED.

In the United States, the assessment was administered to 2,811 students in 124 public and private schools at the beginning of ninth grade.

Table 26 presents the average scores by country for the CIVED 1999 assessment. As shown, no countries have significantly higher average scores than the U.S. and our average score (106) is higher than the international average (100).

Table 26
Overall average scores on CIVED total skills and knowledge (1999)

Country	Score
International Average	**100**
Poland	111
Finland	109
Cyprus/Greece	108
Hong Kong SAR	107
United States	**106**
Italy/Slovak Republic	105
Czech Republic/Norway	103
Australia/Hungary	102
Slovenia	101
Denmark/Germany/Russian Federation	100
Sweden/United Kingdom	99
Bulgaria/Switzerland	98
Portugal	96
Belgium (French)	95
Estonia/Lithuania	94
Latvia/Romania	92

Table 26 (cont'd)

Overall average scores on CIVED total skills and knowledge (1999)

Country	Score
International Average	**100**
Chile	88
Colombia	86

Source: What Democracy Means to Ninth Graders: U.S. Results From the IEA International Civic Education Study, NCES, 2001.

Note: The CIVED is scored on an adjusted scale. The international average is 100. No scores were significantly higher in a statistical sense.

Average is higher than U.S. Average

Average is not measurably different from U.S. Average

Average is lower than U.S. Average

The performance of the U.S. on CIVED is heartening and could be cited as evidence of our international agility. But keep this in mind, too: fewer nations participate in CIVED than the other international assessments. There's also less variation in the scores. The "democratic" content, too, naturally favors nations like the U.S. Finally, CIVED doesn't have the track record that the other international measures have established.

Other Measures

In addition to the PISA, TIMSS, PIRLS, and CIVED data, we include limited 2004 data from the Organisation for Economic Cooperation and Development (OECD). Specifically, we examine academic completion rates (i.e., high school graduation rates and percentage of a country's college-going population receiving bachelor's degrees). Tables 27 and 28 present these data.

As shown (Table 27), Norway, Germany, and Korea have the highest upper secondary (what we call high school in the U.S.) graduation rates. The U.S. rate (75.4) falls below the OECD international average (81.1).

In addition, Finland, at 55.2 percent, has the greatest percentage of its college-going population receiving bachelor's degrees in 2004 at any age (Table 28). The U.S. percentage is 33.3.

Table 27
High school graduation rates (2004)

Country	Upper secondary graduation rate
Norway	99.9
Germany	98.9
Korea	96.1
Ireland	92.4
Japan	91.4
Denmark	90.4
Finland	89.6
Switzerland	89.2
Russian Federation	87.3
Czech Republic	86.5
Hungary	86.1
Iceland	84.1
Slovak Republic	83.2
Italy	81.4
France	81.2
OECD average	**81.1**
Poland	79.3
Sweden	77.9
United States	75.4
New Zealand	74.6
Luxembourg	69.4
Spain	66.1
Brazil	65.4
Turkey	52.8

Canadian Independence

Unlike the U.S. and many other nations, Canada has no federal department of education. The Canadian Constitution specifically bequeaths responsibilities for education to the provinces and territories: "[I]n and for each province, the legislature may exclusively make Laws in relation to Education." Canada remains the only federated nation within OECD that has no means for direct federal involvement in standards and assessments at the elementary and secondary levels.

Source: Canadian Council of Ministers of Education 2008

Table 27 (cont'd)
High school graduation rates (2004)

Country	Upper secondary graduation rate
Mexico	37.7

Source: Education at a Glance, OECD Indicators, OECD, 2006.

Note: Upper secondary graduation rates are estimated as the number of students, regardless of age, who graduate for the first time from upper secondary programs, divided by the population at the age at which students typically graduate from upper secondary education. The rates take into account students graduating from upper secondary education at the typical graduation ages, as well as older or younger students.

Table 28
Greatest percentage of undergraduate degrees (2004)

Country	Percentage
Finland	55.2
New Zealand	50.9
Iceland	50.7
Australia	46.9
France	40.8
Sweden	40.3
Ireland	38.6
Italy	37.7
Japan	36.3
Hungary	35.6
United States	33.3
Spain	31.5
Republic of Korea	31.4
Switzerland	21.6
Czech Republic	21.0
Germany	20.6
Austria	19.6
Belgium, Flemish	18.8
Mexico	14.0

Source: Organization for Economic Cooperation and Development (OECD), Education Online Database.

Note: Includes graduates of any age for the year 2004 divided by the number of persons at the typical age of graduation for respective countries (generally between ages 22–24).

Appendix

Table A-1
Participating countries in the Education Olympics that did not medal

Argentina	Lebanon
Armenia	Lithuania
Austria	Luxembourg
Azerbaijan	Malaysia
Bahrain	Mexico
Belgium	Montenegro
Botswana	Morocco
Brazil	Palestinian National Authority
Bulgaria	Philippines
Chile	Portugal
Colombia	Qatar
Croatia	Republic of Macedonia
Czech Republic	Republic of Moldova
Denmark	Romania
Egypt	Saudi Arabia
France	Serbia
Georgia	Slovak Republic
Ghana	South Africa
Indonesia	Spain
Iran	Sweden
Ireland	Switzerland
Israel	Thailand
Italy	Trinidad & Tobago
Jordan	Tunisia
Kuwait	Turkey
Kyrgyzstan	Uruguay
Latvia	

Table A-2
Complete event results for United States

Event	Finish	Number of participating countries	Score or result
CIVED '99 Civic skills	1	28	114
CIVED '99 Total civic knowledge of 9th-graders	6	28	106
TIMSS '03 4th-grade math score—'Data' content	7	25	549
TIMSS '03 math scores for 4th-grade females	8	15	514
TIMSS '03 math scores for 4th-grade males	8	15	522
% of 15-year-old females at level 6 PISA proficiency in science (PISA '06)	10	57	1.5%
CIVED '99 Civic content	10	28	102
Bachelor's degree recipients	11	19	33.3%
TIMSS '03 4th-grade math score - 'Patterns & Relationships' content area	11	25	524
TIMSS '03 8th-grade math score - 'Algebra' content	11	45	510
TIMSS '03 math scores for 8th-grade males	12	34	507
TIMSS '03 4th-grade math score - 'Number' content area	12	25	516
TIMSS '03 8th-grade math score - 'Data' content	12	45	527
TIMSS '03 8th-grade math score - 'Number' content area	12	45	508
TIMSS 4th-grade math score overall	12	25	518
% of 15-year-old males at level 6 PISA proficiency in science (PISA '06)	13	57	1.6%
% of 15-year-olds at level 6 PISA proficiency subtest (identifying scientific issues) (PISA '06)	13	57	1.2%
TIMSS '03 4th-grade math score - 'Geometry' content	13	25	518
% of 15-year-olds at level 6 PISA proficiency in science	14	57	1.5%
% of 15-year-olds at level 6 PISA proficiency subtest (explaining phenomena scientifically) (PISA '06)	14	57	2.0%

Table A-2 (cont'd)
Complete event results for United States

Event	Finish	Number of participating countries	Score or result
TIMSS '03 math scores for 8th-grade females	14	34	502
TIMSS 8th-grade math score overall	15	45	504
% of 15-year-olds at level 6 PISA proficiency subtest (using scientific evidence) (PISA '06)	16	57	2.5%
PISA '03 Reading literacy score (males)	16	41	479
PISA '06 Combined science literacy scores of first-generation immigrant students	16	23	442
TIMSS '03 4th-grade math score - 'Measurement' content	17	25	500
PIRLS '06 Combined reading literacy score	18	45	540
PIRLS '06 Literacy subscale score	18	45	541
Upper secondary graduation rate (or high school)	18	24	75.4%
PIRLS '06 Informational subscale score	19	45	537
PISA '03 Combined reading literacy score	19	41	495
PISA '03 Reading literacy score (females)	20	41	511
TIMSS '03 8th-grade math score - 'Measurement' content	20	45	495
PISA '06 Subtest, identifying scientific issues (males)	23	57	484
TIMSS '03 8th-grade math score - 'Geometry' content	23	45	472
PISA '06 Subtest, identifying scientific issues	25	57	492
PISA '06 Subtest, identifying scientific issues (females)	26	57	500
PISA '03 Math literacy score (males)	28	41	486
PISA '03 Math literacy score (females)	29	41	480
PISA '03 Problem solving score (females)	29	41	478
PISA '06 Combined science literacy scale	29	57	489
PISA '06 Subtest, using scientific evidence	29	57	489
PISA '06 Subtest, using scientific evidence (females)	29	57	491

Table A-2 (cont'd)
Complete event results for United States

Event	Finish	Number of participating countries	Score or result
PISA '06 Subtest, using scientific evidence (males)	29	57	486
PISA '03 Combined problem solving score	30	41	477
PISA '03 Problem solving score (males)	30	41	477
PISA '06 Science literacy score (females)	30	57	489
PISA '06 Science literacy score (males)	30	57	489
% of 15-year-olds below level 1 PISA proficiency subtest (identifying scientific issues)	31	57	5.6%
PISA '06 Subtest, explaining phenomena scientifically	31	57	486
PISA '06 Subtest, explaining phenomena scientifically (females)	32	57	480
PISA '06 Subtest, explaining phenomena scientifically (males)	32	57	492
% of 15-year-olds below level 1 PISA proficiency subtest (using scientific evidence)	35	57	10.0%
PISA '06 Combined mathematics literacy score	35	57	474
% of 15-year-old males below level 1 PISA proficiency in science	37	57	8.3%
% of 15-year-old females below level 1 PISA proficiency in science	38	57	6.8%
% of 15-year-olds below level 1 PISA proficiency in science	38	57	7.6%
% of 15-year-olds below level 1 PISA proficiency subtest (explaining phenomena scientifically)	38	57	8.4%

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