

# the condition of education 2007



## INDICATOR 13

# Science Performance of Students in Grades 4, 8, and 12

The indicator and corresponding tables are taken directly from *The Condition of Education 2007*. Therefore, the page numbers may not be sequential.

Additional information about the survey data and supplementary notes can be found in the full report. For a copy of *The Condition of Education 2007*, visit the NCES website (<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007064>) or contact ED PUBs at 1-877-4ED-PUBS.

**Suggested Citation:**

U.S. Department of Education, National Center for Education Statistics. (2007). *The Condition of Education 2007* (NCES 2007-064). Washington, DC: U.S. Government Printing Office.



# Academic Outcomes

## Science Performance of Students in Grades 4, 8, and 12

*In 2005, the average science score of students was higher at grade 4 than in previous assessment years, was not measurably different at grade 8, and was lower at grade 12 than in 1996.*

The National Assessment of Educational Progress (NAEP) has assessed the science abilities of students in grades 4, 8, and 12 in both public and private schools since 1996, using a separate 0–300 scale for each grade. The national average 4th-grade science score increased from 147 in 1996 to 151 in 2005; there was no measurable change in the 8th-grade score; and the 12th-grade score decreased from 150 in 1996 to 147 in 2005 (see supplemental table 13-1).

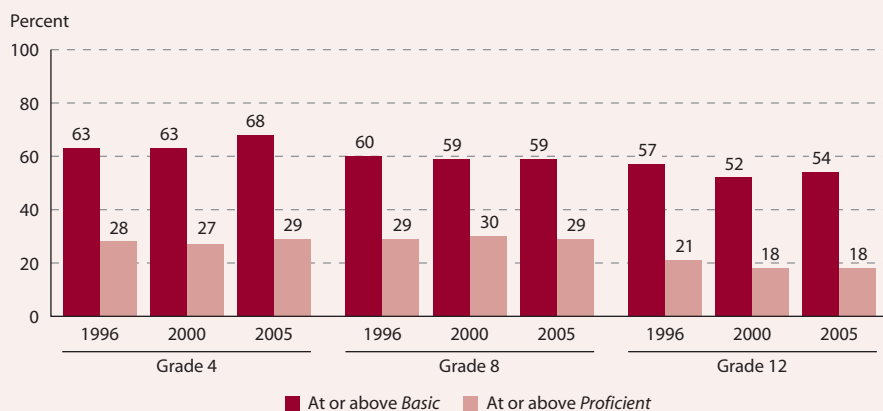
Achievement levels (*Basic*, *Proficient*, and *Advanced*), which identify what students should know and be able to do at each grade, provide another measure of student performance. The percentages of 4th- and 8th-graders at or above *Proficient* (indicating solid academic achievement) were not measurably different from 1996 to 2005, while the percentage of 12th-graders at or above this achievement level was lower in 2005 than in 1996. In 2005, some 29 percent of 4th- and 8th-graders and 18 percent of 12th-graders were at or above *Proficient*.

Certain subgroups outperformed others in science in 2005. For example, males outperformed females

at all three grades. Male 4th-graders had a higher average score in 2005 than in 1996, and both male and female 12th-graders had lower scores in 2005 than in 1996 (see supplemental table 13-2). White students scored higher, on average, than Black and Hispanic students at all three grades in 2005. At 4th grade, average scores were higher for White, Black, Hispanic, and Asian/Pacific Islander students in 2005 than in 1996. At 8th grade, the average score for Black students was higher in 2005 than in 1996, but the scores did not measurably change for other racial/ethnic groups. At 12th grade, there were no measurable changes in average scores for any racial/ethnic group when comparing results from 2005 with those from 1996.

NAEP results also permit state-level comparisons of the abilities of 4th- and 8th-graders (but not 12th-graders) in public schools. At grade 4, of the 36 states that participated in both the 2000 and 2005 assessments, average science scores were higher in 2005 than in 2000 in 9 states (see supplemental table 13-3). At grade 8, of the 36 states that participated in 1996 and 2005, average scores were higher in 2005 than in 1996 in 8 states and lower in 5 states.

**SCIENCE PERFORMANCE: Percentage of students performing at or above *Basic* and at or above *Proficient* in science, by grade: 1996, 2000, and 2005**



NOTE: Variations or changes in exclusion rates for students with disabilities and limited-English-proficient students in the NAEP samples may affect comparative performance results. See supplemental note 4 for more information on testing accommodations and NAEP.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, NAEP Data Explorer.

FOR MORE INFORMATION:  
Supplemental Notes 1, 4  
Supplemental Tables 13-1,  
13-2, 13-3



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## Science Performance of Students in Grades 4, 8, and 12

**Table 13-1. Average science scores overall and by grade level, selected percentiles, and percentage of students at each achievement level: 1996, 2000, and 2005**

Percentile and achievement level	Grade 4			Grade 8			Grade 12		
	1996	2000	2005	1996	2000	2005	1996	2000	2005
<b>Average score</b>									
<b>Total</b>	147*	147*	151	149	149	149	150*	146	147
<b>Percentile<sup>1</sup></b>									
10th	99*	99*	109	103	101	101	105*	101	101
25th	125*	125*	130	127	126	126	128*	124	125
50th	150*	150*	153	152	152	151	152	148	149
75th	172	172	173	174	175*	174	174*	170	171
90th	190	190	189	192	194	192	192*	189	189
<b>Percentage at achievement level</b>									
<b>Achievement level</b>									
Below <i>Basic</i>	37*	37*	32	40	41	41	43*	48	46
At or above <i>Basic</i>	63*	63*	68	60	59	59	57*	52	54
At or above <i>Proficient</i>	28	27	29	29	30	29	21*	18	18
At <i>Advanced</i>	3*	3	3	3	4*	3	3*	2	2

\* Significantly different from 2005 ( $p < .05$ ).

<sup>1</sup> A score location at or below which a specified percentage of the population falls. In 1996, for example, 10 percent of the 4th-graders scored at or below 99, while 90 percent of 4th-graders scored above 99.

NOTE: At the state level, the National Assessment of Educational Progress (NAEP) includes only students in public schools, while national results in this indicator include both public and private school students. Variations or changes in exclusion rates for students with disabilities and limited-English-proficient students in the NAEP samples may affect comparative performance results. See *supplemental note 4* for more information on testing accommodations and NAEP.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, NAEP Data Explorer.

## Science Performance of Students in Grades 4, 8, and 12

**Table 13-2. Average science scores for 4th-, 8th-, and 12th-graders, by selected student characteristics: 1996, 2000, and 2005**

Student characteristic	Grade 4			Grade 8			Grade 12		
	1996	2000	2005	1996	2000	2005	1996	2000	2005
<b>Total</b>	<b>147*</b>	<b>147*</b>	<b>151</b>	<b>149</b>	<b>149</b>	<b>149</b>	<b>150</b>	<b>146</b>	<b>147</b>
Sex									
Male	148*	149*	153	150	153	150	154*	148	149
Female	146	145*	149	148	146	147	147*	145	145
Race/ethnicity <sup>1</sup>									
White	158*	159*	162	159	161	160	159	153	156
Black	120*	122*	129	121*	121	124	123	122	120
Hispanic	124*	122*	133	128	127	129	131	128	128
Asian/Pacific Islander	144*	‡	158	151	153	156	147	149	153
American Indian	129	135	138	148	147	128	144	151	139
Parents' education									
Less than high school	—	—	—	—	—	128	—	—	125
High school diploma or equivalent	—	—	—	—	—	138	—	—	136
Some college	—	—	—	—	—	151	—	—	148
Bachelor's degree or higher	—	—	—	—	—	159	—	—	157
Eligible for free or reduced-price lunch									
Eligible	129*	127*	135	129	127*	130	127	124*	129
Not eligible	159*	158*	162	156*	159	159	154*	149	152
Information not available	151*	160	160	157	155*	160	152*	150*	158

— Not available.

‡ Reporting standards not met (too few cases).

\* Significantly different from 2005 ( $p < .05$ ).

<sup>1</sup> Race categories exclude persons of Hispanic ethnicity.

NOTE: At the state level, the National Assessment of Educational Progress (NAEP) includes only students in public schools, while national results in this indicator include both public and private school students. Variations or changes in exclusion rates for students with disabilities and limited-English-proficient students in the NAEP samples may affect comparative performance results. See *supplemental note 4* for more information on testing accommodations and NAEP.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, NAEP Data Explorer.

## Science Performance of Students in Grades 4, 8, and 12

Table 13-3. Average science scores for public school 4th- and 8th-graders, by state: 1996, 2000, and 2005

State	Grade 4		1996 <sup>1</sup>	Grade 8	
	2000	2005		2000	2005
<b>United States</b>	<b>145*</b>	<b>149</b>	<b>148</b>	<b>148</b>	<b>147</b>
Alabama	143	142	139	143*	138
Arizona	140	139	145*	145*	140
Arkansas	145	147	144	142	144
California	129*	137	138	129*	136
Colorado	—	155	155	—	155
Connecticut	156	155	155	153	152
Delaware	—	152	142*	—	152
Florida	—	150	142	—	141
Georgia	142*	148	142	142	144
Hawaii	136*	142	135	130*	136
Idaho	152	155	—	158	158
Illinois	150	148	—	148	148
Indiana	154	152	153	154*	150
Iowa	159	—	158	—	—
Kentucky	152*	158	147*	150*	153
Louisiana	139	143	132*	134*	138
Maine	161	160	163*	158	158
Maryland	145*	149	145	146	145
Massachusetts	161	160	157*	158*	161
Michigan	152	152	153	155	155
Minnesota	157	156	159	159	158
Mississippi	133	133	133	134	132
Missouri	157	158	151	154	154
Montana	160	160	162	164	162
Nebraska	150	—	157	158	—
Nevada	142	140	‡	141*	138
New Hampshire	—	161	‡	—	162
New Jersey	—	154	‡	—	153
New Mexico	140	141	141*	139	138
New York	148	—	146	145	—
North Carolina	147	149	147	145	144
North Dakota	160	160	162	159*	163
Ohio	155	157	—	159	155
Oklahoma	151	150	—	149	147
Oregon	148	151	155	154	153
Rhode Island	148	146	149*	148	146
South Carolina	140*	148	139*	140*	145
South Dakota	—	158	—	—	161
Tennessee	145*	150	143	145	145
Texas	145*	150	145	143	143

See notes at end of table.

## Science Performance of Students in Grades 4, 8, and 12

**Table 13-3. Average science scores for public school 4th- and 8th-graders, by state: 1996, 2000, and 2005—Continued**

State	Grade 4		1996 <sup>1</sup>	Grade 8	
	2000	2005		2000	2005
Utah	154	155	156*	154	154
Vermont	160	160	157*	159*	162
Virginia	155*	161	149*	151*	155
Washington	—	153	150*	—	154
West Virginia	149	151	147	146	147
Wisconsin	‡	158	160	‡	158
Wyoming	156	157	158	156*	159

— Not available.

‡ Reporting standards not met (too few cases).

\* Significantly different from 2005 ( $p < .05$ ).

<sup>1</sup> Testing accommodations (e.g., extended time, small group testing) for children with disabilities and limited-English-proficient students were not permitted on the 1996 science assessment.

NOTE: Data are presented for states with representative samples large enough for reporting state-level results. At the state level, the National Assessment of Educational Progress (NAEP) includes only students in public schools, while national results in this indicator include both public and private school students. Variations or changes in exclusion rates for students with disabilities and limited-English-proficient students in the NAEP samples may affect comparative performance results. See *supplemental note 4* for more information on testing accommodations and NAEP.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, NAEP Data Explorer.

## Science Performance of Students in Grades 4, 8, and 12

**Table S13-1. Standard errors for the average science scores overall and by grade level, selected percentiles, and percentage of students at each achievement level: 1996, 2000, and 2005**

Percentile and achievement level	Grade 4			Grade 8			Grade 12		
	1996	2000	2005	1996	2000	2005	1996	2000	2005
<b>Average score</b>									
<b>Total</b>	<b>1.1</b>	<b>0.9</b>	<b>0.3</b>	<b>0.8</b>	<b>1.0</b>	<b>0.3</b>	<b>0.7</b>	<b>0.9</b>	<b>0.6</b>
<b>Percentile</b>									
10th	2.1	1.7	0.5	1.5	1.2	0.6	1.4	1.4	1.2
25th	1.6	1.4	0.4	1.2	1.3	0.4	1.1	1.0	0.8
50th	1.2	0.9	0.4	0.7	0.9	0.3	1.2	1.0	0.8
75th	1.0	0.7	0.3	0.8	0.8	0.3	0.8	1.2	0.8
90th	0.8	1.0	0.3	0.8	1.0	0.3	0.9	1.2	1.2
<b>Percentage at achievement level</b>									
<b>Achievement level</b>									
<i>Below Basic</i>	1.4	1.2	0.4	1.0	1.2	0.4	1.0	1.2	0.8
<i>At or above Basic</i>	1.4	1.2	0.4	1.0	1.2	0.4	1.0	1.2	0.8
<i>At or above Proficient</i>	1.0	0.9	0.4	0.9	1.0	0.3	0.8	0.9	0.6
<i>At Advanced</i>	0.3	0.4	0.1	0.3	0.3	0.1	0.3	0.3	0.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, NAEP Data Explorer.

**Table S13-2. Standard errors for the average science scores for 4th-, 8th-, and 12th-graders, by selected student characteristics: 1996, 2000, and 2005**

Characteristic	Grade 4			Grade 8			Grade 12		
	1996	2000	2005	1996	2000	2005	1996	2000	2005
<b>Total</b>	<b>1.1</b>	<b>0.9</b>	<b>0.3</b>	<b>0.8</b>	<b>1.0</b>	<b>0.3</b>	<b>0.7</b>	<b>0.9</b>	<b>0.6</b>
<b>Sex</b>									
Male	1.3	1.1	0.3	0.9	1.1	0.4	1.0	1.1	0.7
Female	1.1	1.0	0.3	0.9	1.1	0.3	0.8	1.0	0.6
<b>Race/ethnicity</b>									
White	0.9	0.7	0.3	0.8	0.8	0.2	0.9	1.2	0.6
Black	1.3	1.0	0.6	0.9	1.4	0.4	1.1	1.7	0.9
Hispanic	3.0	2.3	0.5	2.7	1.4	0.5	2.2	1.7	1.3
Asian/Pacific Islander	3.7	†	1.0	4.2	2.9	0.9	3.3	3.6	1.7
American Indian	11.9	6.9	1.9	3.5	6.7	4.0	7.5	3.6	5.3
<b>Parents' education</b>									
Less than high school	†	†	†	†	†	0.5	†	†	1.4
High school diploma or equivalent	†	†	†	†	†	0.5	†	†	0.9
Some college	†	†	†	†	†	0.4	†	†	0.7
Bachelor's degree or higher	†	†	†	†	†	0.3	†	†	0.6
<b>Eligible for free or reduced-price lunch</b>									
Eligible	1.7	1.3	0.3	1.6	1.1	0.3	1.6	1.8	0.9
Not eligible	0.9	1.1	0.3	0.9	1.0	0.3	0.9	1.2	0.6
Information not available	3.9	1.5	0.9	2.3	1.7	1.5	2.0	1.8	1.9

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, NAEP Data Explorer.

## Science Performance of Students in Grades 4, 8, and 12

Table S13-3. Standard errors for the average science scores for public school 4th- and 8th-graders, by state: 1996, 2000, and 2005

State	Grade 4		1996	Grade 8	
	2000	2005		2000	2005
<b>United States</b>	<b>1.1</b>	<b>0.3</b>	<b>0.9</b>	<b>1.1</b>	<b>0.3</b>
Alabama	1.7	1.2	1.6	1.7	1.3
Arizona	1.8	1.5	1.6	1.3	0.9
Arkansas	1.3	1.2	1.3	1.2	1.0
California	3.0	0.6	1.7	1.8	0.7
Colorado	†	1.1	0.9	†	1.3
Connecticut	1.3	1.0	1.3	1.6	1.0
Delaware	†	0.6	0.8	†	0.6
Florida	†	0.6	1.6	†	1.2
Georgia	1.4	1.3	1.4	1.6	1.1
Hawaii	1.4	1.0	0.7	1.4	0.8
Idaho	1.4	0.8	†	1.0	1.0
Illinois	2.4	1.0	†	1.7	1.1
Indiana	1.5	1.0	1.4	1.4	1.3
Iowa	1.3	†	1.2	†	†
Kentucky	1.2	0.9	1.2	1.2	0.9
Louisiana	1.8	1.1	1.6	1.5	1.5
Maine	1.1	0.9	1.0	0.9	0.7
Maryland	1.3	1.1	1.5	1.4	1.4
Massachusetts	1.4	1.0	1.4	1.1	1.0
Michigan	1.8	1.3	1.4	1.8	1.2
Minnesota	1.6	1.1	1.3	1.2	1.1
Mississippi	1.4	1.2	1.4	1.2	1.2
Missouri	1.2	1.0	1.2	1.2	1.2
Montana	1.5	0.9	1.2	1.4	0.8
Nebraska	1.8	†	1.0	1.4	†
Nevada	1.2	1.0	†	1.0	0.9
New Hampshire	†	0.9	†	†	0.9
New Jersey	†	1.3	†	†	1.2
New Mexico	1.8	1.0	1.0	1.5	0.9
New York	1.3	†	1.6	2.1	†
North Carolina	1.3	0.9	1.2	1.4	1.0
North Dakota	0.9	0.5	0.8	1.1	0.6
Ohio	1.4	1.2	†	1.5	1.2
Oklahoma	1.3	1.1	†	1.1	1.3
Oregon	2.0	1.0	1.6	1.3	1.0
Rhode Island	1.3	1.1	0.8	0.9	0.7
South Carolina	1.3	1.1	1.5	1.4	1.1
South Dakota	†	0.5	†	†	0.7
Tennessee	1.4	1.1	1.8	1.5	1.2
Texas	1.8	0.7	1.8	1.7	0.8

See notes at end of table.



## Science Performance of Students in Grades 4, 8, and 12

**Table S13-3. Standard errors for the average science score for public school 4th- and 8th-graders, by state: 1996, 2000, and 2005—Continued**

State	Grade 4		Grade 8		
	2000	2005	1996	2000	2005
Utah	1.3	0.8	0.8	1.0	0.7
Vermont	1.3	0.6	1.0	1.0	0.6
Virginia	1.4	1.0	1.6	1.0	1.1
Washington	†	1.0	1.3	†	0.8
West Virginia	1.3	0.8	0.9	1.1	0.8
Wisconsin	†	0.9	1.7	†	1.0
Wyoming	1.3	0.5	0.6	1.0	0.6

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, NAEP Data Explorer.