

# MATHEMATICS 2007

## State and National Results at Grades 4 and 8

[http://nationsreportcard.gov/math\\_2007/](http://nationsreportcard.gov/math_2007/)



### Statistics

#### Fourth Grade

**Students assessed:** 197,700

**Schools assessed:** 7,840

**Student demographic breakdown:**

White: 57%

Black: 16%

Hispanic: 20%

Asian/Pacific Islander: 5%

American Indian/Alaska Native: 1%

National School Lunch Program—Eligible: 42%

SD and/or ELL—Accommodated: 10%

**National student participation rate:**

Public: 94.6%

Private: 96.3%

**National school participation rate:**

Public: 99.7%

Private: 77.5%

#### Eighth Grade

**Students assessed:** 153,000

**Schools assessed:** 6,910

**Student demographic breakdown:**

White: 59%

Black: 16%

Hispanic: 18%

Asian/Pacific Islander: 5%

American Indian/Alaska Native: 1%

National School Lunch Program—Eligible: 38%

SD and/or ELL—Accommodated: 7%

**National student participation rate:**

Public: 91.9%

Private: 95.1%

**National school participation rate:**

Public: 99.7%

Private: 73.8%

## Executive Summary

Both fourth- and eighth-graders reached a higher level of performance in 2007 compared to earlier assessment years.

The 2007 National Assessment of Educational Progress (NAEP) evaluated students' understanding of mathematics concepts and their ability to apply mathematics to everyday situations. Students demonstrated their knowledge of these critical skills by responding to questions about number properties and operations, measurement, geometry, data analysis and probability, and algebra.

A nationally representative sample of more than 350,000 students at grades 4 and 8 participated in the 2007 mathematics assessment. Comparing these results to results from previous years shows the progress fourth- and eighth-graders are making both in the nation and in individual states.

The average score for fourth-graders increased 27 points over the past 17 years, and the score for eighth-graders increased 19 points. Students at all levels of performance made gains, resulting in higher percentages of students at or above the *Basic* and *Proficient* achievement levels.

### Student groups make gains, few gaps narrow

As indicated in the chart on the following page, improvements for minority students did not always result in narrower achievement gaps with White students. White, Black, and Hispanic students at both grades showed a better understanding of mathematics in 2007 when compared to all previous assessment years. However, when compared to the first assessment year in 1990, only the White – Black score gap at grade 4 narrowed in 2007. The White – Black score gap at grade 8 narrowed between 2005 and 2007.

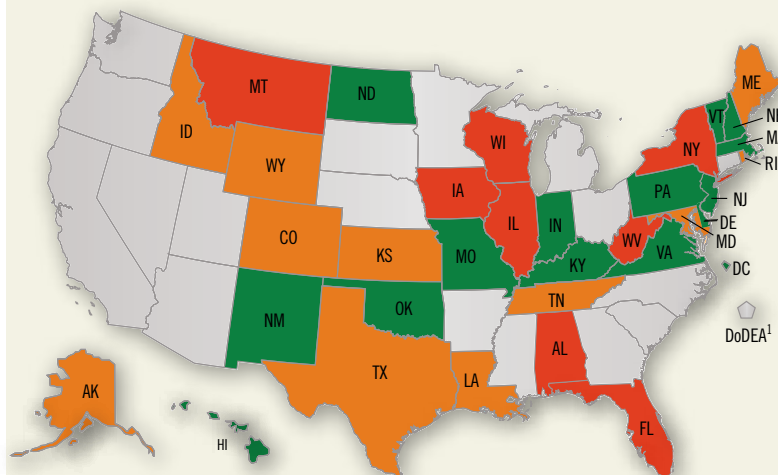
The mathematics score for Asian/Pacific Islander students was higher in 2007 than in previous assessment years for grade 4, but at grade 8 showed no significant change from 2005 to 2007.

Student groups	Grade 4		Grade 8	
	Since 1990	Since 2005	Since 1990	Since 2005
<b>Overall</b>	↑	↑	↑	↑
White	↑	↑	↑	↑
Black	↑	↑	↑	↑
Hispanic	↑	↑	↑	↑
Asian/Pacific Islander	↑	↑	↑	↔
American Indian/ Alaska Native	‡	↔	‡	↔
<b>Gaps</b>				
White – Black	↓	↔	↔	↓
White – Hispanic	↔	↔	↔	↔

- ↑ Indicates the score was higher or the gap increased in 2007.
- ↓ Indicates the score was lower or the gap decreased in 2007.
- ↔ Indicates there was no significant change in the score or the gap in 2007.
- ‡ Reporting standards not met. Sample size was insufficient to permit a reliable estimate.

At both grades 4 and 8, scores rose for students regardless of their eligibility for the free and reduced-price school lunch program, a measure of socioeconomic status. Average scores were higher in 2007 than in 2005 for students who were eligible as well as for students who were not eligible.

## FIFTEEN STATES AND JURISDICTIONS MAKE GAINS AT BOTH GRADES



<sup>1</sup> Department of Defense Education Activity (overseas and domestic schools).

### Compared with 2005,

- 14 states and the District of Columbia improved at both grades,
  - 8 states improved at grade 4 only,
  - 11 states improved at grade 8 only, and
  - 17 states and Department of Defense schools showed no significant change at either grade.
- No states showed score decreases.

Differing patterns emerged when results were examined by different mathematics content areas. For example, 9 of the 29 states and jurisdictions that showed no change in overall performance at grade 4 did show a gain in at least one of the five content areas.



## EXAMPLES OF WHAT STUDENTS CAN DO IN MATHEMATICS

### GRADE 4

**80%** identified a fraction modeled by a picture

**64%** determined the probability of a specific outcome

**43%** explained how to find the perimeter of a given shape

### GRADE 8

**71%** estimated time given a rate and a distance

**54%** computed the measure of an angle in a figure

**25%** identified the graph of a linear equation

# MATHEMATICS 2007

## Trial Urban District Assessment Results at Grades 4 and 8

[http://nationsreportcard.gov/tuda\\_math\\_2007/](http://nationsreportcard.gov/tuda_math_2007/)



### Statistics

#### Fourth Grade

**Students assessed:** 21,400

**Schools assessed:** 790

**Student demographic breakdown:**

White: 14%

Black: 29%

Hispanic: 49%

Asian/Pacific Islander: 8%

National School Lunch Program—Eligible: 80%

SD and/or ELL—Accommodated: 7%-25%\*

#### Eighth Grade

**Students assessed:** 16,500

**Schools assessed:** 560

**Student demographic breakdown:**

White: 13%

Black: 31%

Hispanic: 47%

Asian/Pacific Islander: 8%

National School Lunch Program—Eligible: 78%

SD and/or ELL—Accommodated: 5%-19%\*

\* Indicates the range of percentages among participating TUDAs.

## Executive Summary

At both grades 4 and 8, most districts had higher percentages of students performing at or above *Basic* and *Proficient* in 2007 compared with 2003. In general, there was a reduction in percentages of students performing below *Basic* and an increase in percentages at or above *Basic*.

The results from the NAEP Trial Urban District Assessment (TUDA) make it possible to compare the performance of students in participating urban school districts to that of public school students in the nation, in large central cities (population over 250,000), and to each other.

About 38,000 fourth- and eighth-graders from 11 urban districts participated in the third TUDA in mathematics in 2007. Ten of the districts also have results for two previous assessments (2003 and 2005). Results for Austin are reported for one earlier assessment (2005).

Atlanta	Chicago	Los Angeles
Austin	Cleveland	New York City
Boston	District of Columbia	San Diego
Charlotte	Houston	

#### At grade 4

- Eight districts showed increases compared with 2003, four districts had higher average scores compared with 2005, and one district had a lower average score in 2007 compared with 2005.
- All eight districts showing increases since 2003 also had higher percentages of students performing at or above *Basic* and at or above *Proficient*, and five had higher percentages of students at *Advanced*.

#### At grade 8

- Eight districts showed increases compared with 2003, and six districts had higher average scores than in 2005.
- Of the eight districts showing score increases since 2003, seven had higher percentages of students at or above *Basic*, six had higher percentages at or above *Proficient*, and four had higher percentages at *Advanced*.

## Changes in NAEP mathematics scores

District	Grade 4		Grade 8	
	Since 2003	Since 2005	Since 2003	Since 2005
Atlanta	↑	↑	↑	↑
Austin	—	↔	—	↔
Boston	↑	↑	↑	↑
Charlotte	↔	↔	↑	↔
Chicago	↑	↔	↑	↔
Cleveland	↔	↓	↔	↑
District of Columbia	↑	↑	↑	↑
Houston	↑	↔	↑	↑
Los Angeles	↑	↔	↑	↑
New York City	↑	↑	↔	↔
San Diego	↑	↔	↑	↔

↑ Indicates the score was higher in 2007.

↓ Indicates the score was lower in 2007.

↔ Indicates there was no significant change in the score in 2007.

— District did not participate in 2003.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Trial Urban District Mathematics Assessment.

## CONTEXT FOR URBAN DISTRICT RESULTS

It is important to examine the results for each of the districts by race/ethnicity and family income status. There is generally a higher concentration of minority (races other than White) and lower-income families in these urban districts than in the nation as a whole.

For example, Black and Hispanic students made up about 38 percent of fourth-graders in the nation, but between 56 and 92 percent of the fourth-graders across the 11 districts. At grade 8, between 49 and 100 percent of students in each of the participating districts were eligible for the National School Lunch Program (an indicator of poverty) in 2007, compared to 41 percent of eighth-graders nationally.

In many cases, when scores for only Black, Hispanic, or lower-income students in the districts are compared with their peers nationally, students in the districts score comparably or higher. Additionally, over time these student groups are making gains.

## GAINS MADE BY BLACK, HISPANIC, AND LOWER-INCOME STUDENTS

At grade 4, compared with 2003, scores were higher for

- White students in four districts, Black students in five districts, Hispanic students in six districts, lower-income students in eight districts, and
- all three racial/ethnic groups in two of the districts.

At grade 8, compared with 2003, scores were higher for

- White students in four districts, Black students in six districts, Hispanic students in four districts, lower-income students in eight districts, and
- all three racial/ethnic groups in two districts.

## LOWER-INCOME STUDENTS IN MANY DISTRICTS OUTPERFORM PEERS IN NATION

When results for only lower-income students in 2007 were compared at grade 4

- five districts had higher average scores than the score for lower-income students in the nation, and
- six districts scored lower.

When only scores for lower-income students were compared at grade 8

- six districts had scores that were higher than or not significantly different from the score for lower-income students in the nation, and
- five districts scored lower.

## HALF OF DISTRICTS PERFORM HIGHER THAN LARGE CENTRAL CITIES

In 2007, fourth-graders in Austin, Boston, Charlotte, Houston, New York City, and San Diego scored higher on average than students in large central cities. Scores for fourth-graders in the other five districts were lower than the score for students in large central cities.

Eighth-graders in Austin, Boston, Charlotte, Houston, and San Diego scored higher, on average, than students in large central cities. Students in Atlanta, Chicago, Cleveland, the District of Columbia, and Los Angeles scored lower on average, and the score for eighth-graders in New York City was not significantly different from the score for students in large central cities.

# WRITING 2007



## State, National, and District-level Results at Grades 8 and 12

[http://nationsreportcard.gov/writing\\_2007/](http://nationsreportcard.gov/writing_2007/)

### Statistics

#### Eighth Grade

**Students assessed:** 139,900

**Schools assessed:** 6,810

**Student demographic breakdown:**

White: 59%

Black: 16%

Hispanic: 18%

Asian/Pacific Islander: 5%

American Indian/Alaska Native: 1%

National School Lunch Program—Eligible: 38%

SD and/or ELL—Accommodated: 8%

**National student participation rate:**

Public: 92.0%

Private: 95.0%

**National school participation rate:**

Public: 99.7%

Private: 73.8%

#### Twelfth Grade

**Students assessed:** 27,900

**Schools assessed:** 660

**Student demographic breakdown:**

White: 64%

Black: 15%

Hispanic: 14%

Asian/Pacific Islander: 5%

American Indian/Alaska Native: 1%

SD and/or ELL—Accommodated: 6%

**National student participation rate:**

Public: 79.1%

Private: 86.3%

**National school participation rate:**

Public: 91.6%

Private: 62.5%

#### TUDA—Eighth Grade

**Students assessed:** 14,800

**Schools assessed:** 520

**Student demographic breakdown:**

White: 14%

Black: 29%

Hispanic: 48%

Asian/Pacific Islander: 9%

National School Lunch Program—Eligible: 78%

SD and/or ELL—Accommodated: 4%-19%\*

\* Indicates the range of percentages among participating TUDAs.

## Executive Summary

The writing skills of eighth- and twelfth-graders improved in 2007 compared to earlier assessment years, with gains across many student groups.

Nationally representative samples of more than 165,000 eighth- and twelfth-graders participated in the 2007 National Assessment of Educational Progress (NAEP) writing assessment (the assessment was not administered at grade 4 in 2007). Each student responded to 2 out of 20 possible writing tasks intended to measure one of three purposes for writing: narrative, informative, or persuasive.

Results are presented nationally for both eighth- and twelfth-graders, and in participating states and urban districts only for eighth-graders. Comparing the results of the 2007 writing assessment to results from previous years shows the progress eighth- and twelfth-graders are making in improving writing skills.

### Scores increase in 2007 for both eighth- and twelfth-graders nationally

Average writing scores were higher in 2007 than in previous assessments in 2002 and 1998. Increases were also seen since 2002 in percentages of students performing at or above the *Basic* achievement level but not at or above *Proficient*.

#### At grade 8 in 2007

- The average writing score was 3 points higher than in 2002 and 6 points higher than in 1998.
- The percentage of students performing at or above the *Basic* level increased from 85 percent in 2002 to 88 percent and was also higher than in 1998.
- The percentage of students performing at or above the *Proficient* level was higher than in 1998 but showed no significant change since 2002.

#### At grade 12 in 2007

- The average writing score was 5 points higher than in 2002 and 3 points higher than in 1998.
- The percentage of students performing at or above the *Basic* level increased from 74 percent in 2002 to 82 percent and was also higher than in 1998.
- The percentage of students performing at or above the *Proficient* level was higher than in 1998 but showed no significant change since 2002.

## Most racial/ethnic groups gain

As shown in the chart below, average writing scores increased since 2002 for White, Black, and Asian/Pacific Islander students at both grades. The average score for Hispanic eighth-graders was higher in 2007 than in both previous assessments, while there was no significant change for Hispanic students at grade 12.

## Some racial/ethnic and gender gaps are closing

Gains for minority students and male students have contributed to the narrowing of some gaps. At grade 8, the 6-point increase in the average score for Black students from 2002 to 2007 contributed to a smaller gap between White and Black students than in both previous assessments.

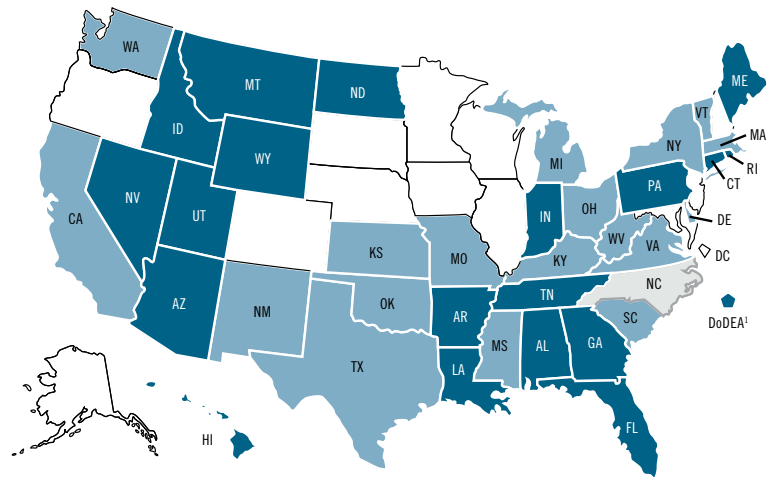
At grade 12, an 8-point increase for male students since 2002 contributed to a narrowing of the male – female gap in comparison to 2002, but there was no significant change in comparison to the gap in 1998.

Student groups	Grade 8		Grade 12	
	Since 1998	Since 2002	Since 1998	Since 2002
<b>Overall</b>	↑	↑	↑	↑
White	↑	↑	↑	↑
Black	↑	↑	↔	↑
Hispanic	↑	↑	↔	↔
Asian/Pacific Islander	↔	↑	↔	↑
American Indian/ Alaska Native	↔	↔	↔	‡
Male	↑	↑	↑	↑
Female	↑	↑	↑	↔
<b>Gaps</b>				
White – Black	↓	↓	↔	↔
White – Hispanic	↔	↔	↔	↔
Female – Male	↔	↔	↔	↓

- ↑ Indicates the score was higher or the gap increased in 2007.
- ↓ Indicates the score was lower or the gap decreased in 2007.
- ↔ Indicates there was no significant change in the score or the gap in 2007.
- ‡ Reporting standards not met. Sample size is insufficient to permit a reliable estimate.

These and other results can be found at <http://nationsreportcard.gov>.

## Some states gain at grade 8



<sup>1</sup> Department of Defense Education Activity (overseas and domestic schools).

### Of the 39 states and jurisdictions that participated in both 2002 and 2007, average writing scores for eighth-graders in

- 19 states and Department of Defense schools increased,
- 1 state decreased, and
- 18 states showed no significant change.
- Twelve states and the District of Columbia did not participate or did not meet the minimum participation guidelines for reporting.

## Urban districts gain

As shown in the chart to the right, eighth-graders in three of the four districts that participated in both the 2002 and 2007 NAEP writing Trial Urban District Assessments (TUDA) improved. When compared to their home states, Atlanta and Los Angeles made greater gains since 2002.

District	Since 2002
Atlanta	↑
Chicago	↑
Houston	↔
Los Angeles	↑

While scores in 9 of the 10 participating urban districts were lower than the average score for eighth-graders in the nation, when comparing results for only lower-income students, scores in six districts were not significantly different from the nation. Lower-income students in Boston and New York City scored higher on average than their peers in large central cities (i.e., cities with populations of 250,000 or more).

Among the 10 districts that participated in 2007, the average writing score for eighth-graders in Charlotte was higher than the score for public school students in large central cities. Also in comparison to large central cities, scores for students in Cleveland and Los Angeles were lower, and scores in the remaining seven districts were not significantly different.

# Improving 12th Grade Participation on NAEP

Student participation in NAEP at grade 12 in public schools has been a concern for several years, with the student participation rate declining to a low of 66 percent in the 2005 assessment. The National Assessment Governing Board established committees to address this concern and the National Center for Education Statistics convened panels of high school principals, district superintendents, teachers, and students to discuss possible solutions. Out of these efforts, NCES implemented a broad set of strategies for the NAEP 2007 that were aimed at increasing student participation for the NAEP 2007 assessment.

Highlights of the strategies include the following:

- Earlier notification that schools had been selected for NAEP to allow administrators to include the assessment on school calendars.
- Flexible scheduling on assessment day to ensure that seniors are in school and available at the time of the assessment. This includes conducting multiple assessment sessions throughout the day.
- Development of a *Best Practices Guide* with tips for administrators and teachers for improving student participation.
- Communication and outreach efforts by NAEP State Coordinators and field staff to share best practices ideas and tools, and to discuss and confirm strategies that the school selected to use.

## Grade 12 Public School Student Participation Rates Increased

The results indicate improvement in student participation in 2007:

- The overall student participation rate improved to 79 percent in 2007, an increase of 13 percentage points from the low of 66 percent in 2005.

- Participation rates improved in all geographic regions by 11 to 17 percentage points.
- Improvements were seen across all race/ethnic groups, for both genders, and among students on free/reduced price lunch as well as students who were not eligible.
- Increases in student participation were observed in small, medium, and large schools, and in schools located in rural, suburban, and urban locations.

## TECHNICAL NOTES

- Only statements of difference that have been tested and found to be statistically significant at .05 level are discussed in NAEP reports.
- The numbers of schools are rounded to the nearest ten, and the numbers of students are rounded to the nearest hundred.
- Students identified as both SD and ELL were counted only once under the combined SD and/or ELL category.
- American Indian/Alaskan Native students were not included in the TUDA statistics because the percentages at both 4th and 8th grades round to zero.
- Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.

## 2007 ASSESSMENTS

REPORT	DATA COLLECTION COMPLETION	DATE APPROVED FOR RELEASE	RELEASE DATE
Reading 2007	March 2007	September 12, 2007	September 25, 2007
Reading TUDA 2007	March 2007	October 29, 2007	November 15, 2007
Mathematics 2007	March 2007	September 12, 2007	September 25, 2007
Mathematics TUDA 2007	March 2007	October 29, 2007	November 15, 2007
Writing 2007	March 2007	February 29, 2008	April 4, 2008

## OTHER MAJOR REPORTS RELEASED IN 2007

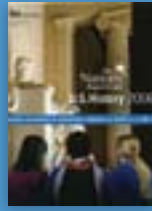


### 12th Grade Reading and Mathematics 2005

Provides national results on the performance of America's high school seniors in reading and mathematics.

[http://nationsreportcard.gov/reading\\_math\\_grade12\\_2005/](http://nationsreportcard.gov/reading_math_grade12_2005/)

Release date: February 22, 2007



### U.S. History 2006

Provides results on the performance of fourth-, eighth-, and twelfth-graders. Results are compared to previous assessments in 1994 and 2001.

[http://nationsreportcard.gov/ushistory\\_2006/](http://nationsreportcard.gov/ushistory_2006/)

Release date: May 16, 2007



### 2005 NAEP High School Transcript Study

Provides data about the types of courses 2005 high school graduates took, how many credits they earned, and the grades they received.

Information on the relationships between high school records and performance in mathematics and science on NAEP is included.

[http://nationsreportcard.gov/hsts\\_2005/](http://nationsreportcard.gov/hsts_2005/)

Release date: February 22, 2007



### Civics 2006

Provides results on the performance of fourth-, eighth-, and twelfth-graders. Results are compared to the previous assessment in 1998.

[http://nationsreportcard.gov/civics\\_2006/](http://nationsreportcard.gov/civics_2006/)

Release date: May 16, 2007



### Mathematics 2003 and 2005 Performance in Puerto Rico—Highlights

The first of two reports, Highlights provides data on the performance of fourth- and eighth-graders in Puerto Rico in Mathematics for 2003 and 2005.

[http://nationsreportcard.gov/puertorico\\_2005/](http://nationsreportcard.gov/puertorico_2005/)

Release date: March 29, 2007



### Mapping 2005 State Proficiency Standards Onto the NAEP Scales

This study uses 2005 results from state assessments and NAEP in reading and mathematics to calculate a NAEP-equivalent score for each state standard.

<http://nces.ed.gov/nationsreportcard/pubs/studies/2007482.asp>

Release date: June 7, 2007



### Mathematics 2005 Performance in Puerto Rico—Focus on the Content Areas

The second report focuses on Puerto Rico student performance in the five individual mathematics content areas identified in the NAEP framework:

numbers and operations, measurement, geometry, data analysis and probability, and algebra.

<http://nationsreportcard.gov/puertorico/>

Release date: March 29, 2007



### Economics 2006

Provides first-ever results on the performance of twelfth-grade students in economics. Student knowledge was measured in three areas: market economy, national economy, and international economy.

[http://nationsreportcard.gov/economics\\_2006/](http://nationsreportcard.gov/economics_2006/)

Release date: August 8, 2007



For more information about NAEP, visit  
<http://nces.ed.gov/nationsreportcard>

You can also contact the **National Center  
for Education Statistics** at:

National Center for Education Statistics  
Assessment Division – 8th Floor  
1990 K Street NW  
Washington, DC 20006  
Phone: 202-502-7420  
<http://nces.ed.gov/nationsreportcard/contactus.asp>

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