ies NATIONAL CENTER FOR EDUCATION STATISTICS
Institute of Education Sciences

National Indian Education Study 2007

NAEP
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

PART I

Performance of American Indian and Alaska Native Students at Grades 4 and 8 on NAEP 2007 Reading and Mathematics Assessments

NCES 2008–457

U.S. DEPARTMENT OF EDUCATION

CONTENTS

Student Artwork on the cover:
Untitled by Samuel Dalgai;
tribal affiliation: Navajo

The National Indian Education Study (NIES) is a two-part study designed to describe the condition of education for American Indian and Alaska Native students in the United States. The study is sponsored by the Office of Indian Education and conducted by the National Center for Education Statistics of the U.S. Department of Education. NIES is authorized under Executive Order 13336, *American Indian and Alaska Native Education*, which was enacted in 2004 to improve education efforts for American Indian and Alaska Native students nationwide. (See http://www.whitehouse.gov/news/releases/2004/04/20040430-10.html for details.)

Part I of the NIES is conducted through the National Assessment of Educational Progress (NAEP) and provides in-depth information on the academic performance of fourth- and eighth-grade American Indian and Alaska Native students in reading and mathematics. NAEP is a congressionally mandated project of the U.S. Department of Education. By reporting student achievement data at the national, state, and local levels, NAEP plays an integral role in evaluating what our children know and can do in various subjects. NAEP is carried out by the Commissioner of the National Center for Education Statistics (within the Institute of Education Sciences). The National Assessment Governing Board oversees and sets policy for NAEP.

Part II of the NIES is a survey that describes the educational experiences of the fourth- and eighth-grade American Indian and Alaska Native students who participated in the NAEP assessments. The survey focuses on the integration of native language and culture into school and classroom activities.

Conducted in 2005 and 2007, NIES provides data on nationally representative samples of American Indian and Alaska Native students from public, private, Department of Defense, and Bureau of Indian Education funded schools. It is a reliable source of data on American Indian and Alaska Native students, especially for educators, administrators, and policymakers who address the educational needs of students. NIES is advised by a technical review panel; members of this panel include educators and researchers selected for their expertise in American Indian and Alaska Native education.

Executive Summary

The 2007 National Indian Education Study (NIES) was conducted by the National Center for Education Statistics on behalf of the U.S. Department of Education, Office of Indian Education. This report presents the results for Part I of the study focusing on the performance of American Indian and Alaska Native (AI/AN) fourth- and eighth-graders on the 2007 National Assessment of Educational Progress in reading and mathematics.

A national sample of approximately 10,100 AI/AN students at grades 4 and 8 participated in the 2007 reading assessment and 10,300 in the mathematics assessment. Results from this study are compared to those from the first NIES conducted in 2005. The results for 11 states with relatively large populations of AI/AN students are presented in addition to the national results.

READING RESULTS

Overall, the average reading scores for AI/AN fourth- and eighth-graders showed no significant change since 2005 and were lower than the scores for non-AI/AN students in 2007.

In 2007 at both grades, AI/AN students attending schools in which less than 25 percent of the students were AI/AN scored higher than their peers attending schools with higher concentrations of AI/AN students, and those attending public schools scored higher than their peers in Bureau of Indian Education schools.

Patterns in reading results vary when AI/AN students are compared to other racial/ethnic groups

While the overall average reading scores for AI/AN students were lower than the scores for non-AI/AN students at both grades in 2007, they were not consistently lower than the scores for all racial/ethnic groups.

- Average scores for AI/AN students were not significantly different from the scores for Black or Hispanic students but were lower than the scores for White and Asian/Pacific Islander students.
- Scores for higher-performing AI/AN students—those at the 75th and 90th percentiles—were higher than those of their Black peers.
- AI/AN fourth-graders attending city schools scored higher than their Black and Hispanic peers, and AI/AN eighth-graders attending rural schools scored lower than their Hispanic peers.

AI/AN students in some states score higher in reading than their peers in the nation

When compared to the scores for all AI/AN students in the nation, average reading scores for AI/AN fourth-graders in Oklahoma and eighth-graders in Oklahoma and Oregon were higher in 2007. Scores for AI/AN fourth- and eighth-graders in Alaska, Arizona, New Mexico, and South Dakota were lower than the average scores of all AI/AN students nationwide.

MATHEMATICS RESULTS

Overall, the average mathematics scores for AI/AN fourth- and eighth-graders showed no significant change since 2005 and were lower than the scores for non-AI/AN students in 2007. There was, however, an increase in the percentage of AI/AN fourth-graders performing at or above the *Proficient* level from 21 percent in 2005 to 25 percent in 2007.

In 2007 at both grades, AI/AN students attending schools in which less than 25 percent of the students were AI/AN scored higher than their peers attending schools with higher concentrations of AI/AN students, and those attending public schools scored higher than their peers in Bureau of Indian Education schools.

Patterns in mathematics results vary when AI/AN students are compared to other racial/ethnic groups

While the overall average mathematics scores for AI/AN students were lower than the scores for non-AI/AN students at both grades in 2007, they were not consistently lower than the scores for all racial/ethnic groups.

- AI/AN students at both grades scored higher on average than Black students, scored lower than White and Asian/Pacific Islander students, and had average scores that were not significantly different from Hispanic students.
- Scores for higher-performing AI/AN students—those at the 75th and 90th percentiles—were higher than scores for their Black peers.

Introduction

The National Indian Education Study (NIES) was conducted by the National Center for Education Statistics on behalf of the U.S. Department of Education, Office of Indian Education. NIES is the only nationally representative assessment of American Indian/Alaska Native (AI/AN) students. It lays the foundation for gathering useful trend data for this student population.

The NIES Project

This report, Part I of the study, focuses on the performance results of fourth- and eighth-grade AI/AN students on the 2007 National Assessment of Educational Progress (NAEP) in reading and mathematics. The first NIES study was conducted in 2005, and the results for 2007 are compared to results from that assessment in this report.

Presidential Executive Order 13336 called for a closer examination of the educational experiences and progress of AI/AN students, as well as the promotion of research opportunities and collaboration with tribal communities. The data presented in this report and the forthcoming Part II report provide additional information that will help inform policymakers, researchers, and educators.

NIES Part II will present the results gathered from questionnaires completed by AI/AN students, the teachers who teach them, and the administrators of schools that serve them, and will provide a snapshot of the cultural and educational experiences of AI/AN fourth- and eighth-graders.

Sample Design

The NIES sample was designed as an augmentation of the 2007 NAEP reading and mathematics assessment samples of AI/AN students in the fourth and eighth grades. Race/ethnicity information from official school records was used to identify AI/AN students during sampling. In 2007, about 10,100 AI/AN students participated in the reading assessment, and about 10,300 AI/AN students participated in the mathematics assessment (table 1). The national results reflect the performance of students enrolled in public, Bureau of Indian Education (BIE), Department of Defense, and private schools. The percentage of sampled AI/AN students enrolled in schools other than public and BIE schools nationally was approximately 5 percent.

Table 1. **Number of participating schools with AI/AN students and number of participating AI/AN students in NAEP reading and mathematics at grades 4 and 8: 2007**

	Reading		Mathematics	
Grade	Schools	Students	Schools	Students
Grade 4	1,470	5,300	1,450	5,700
Grade 8	1,260	4,800	1,270	4,600

NOTE: AI/AN = American Indian/Alaska Native. The numbers of schools are rounded to the nearest ten. The numbers of students are rounded to the nearest hundred.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Results are reported for 11 states with relatively large populations of AI/AN students. Nationally, AI/AN students comprise about 1 percent of all students, but in the 11 selected states combined, they make up almost

6 percent of the overall student population (table 2). Over 50 percent of the nation's AI/AN students reside in the 11 states for which state-level results are provided in this report, with about 42 percent residing in the other 39 states and the District of Columbia.

Table 2. **Total enrollment, AI/AN enrollment, and AI/AN students as a percentage of total enrollment in public elementary and secondary schools, by selected states: 2005–06**

State	Total enrollment (all students)	AI/AN enrollment	AI/AN as percent of total
Nation	49,894,627	646,287	1.3
Total for selected states	**6,394,808**	**374,960**	**5.9**
Alaska	133,288	35,393	26.6
Arizona	1,094,454	67,498	6.2
Minnesota	839,243	17,400	2.1
Montana	145,416	16,422	11.3
New Mexico	326,758	36,210	11.1
North Carolina	1,416,436	20,463	1.4
North Dakota	98,283	8,483	8.6
Oklahoma	634,739	120,122	18.9
Oregon	552,194	12,986	2.4
South Dakota	122,012	12,775	10.5
Washington	1,031,985	27,208	2.6

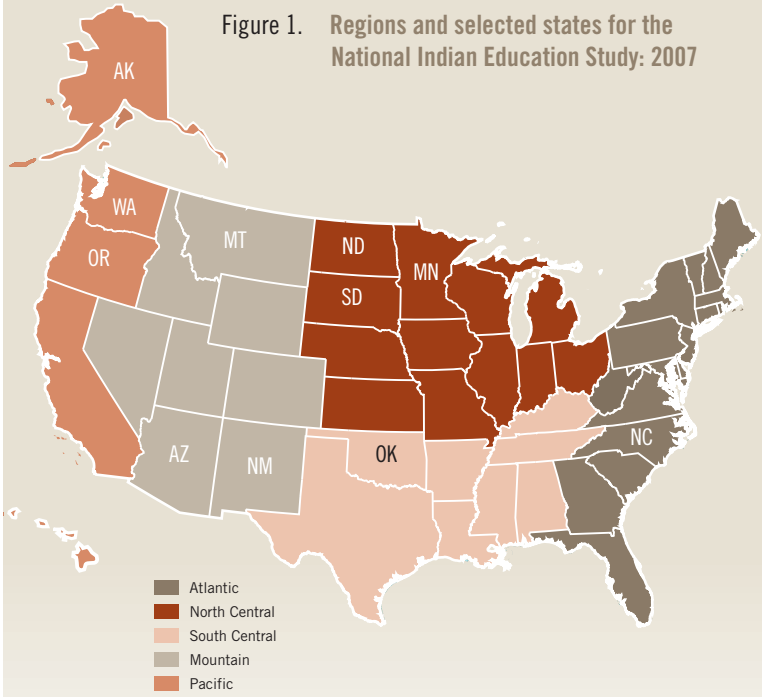
NOTE: AI/AN = American Indian/Alaska Native.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey," unpublished data, 2005–06.

State-level results, drawn from public and BIE schools only, are compared to results from a national sample of AI/AN students from public and BIE schools.

High density schools were over-sampled for NIES 2007 to support the reporting of results based on "school density." (See Technical Notes for more details on the sampling design.) School density indicates the proportion of AI/AN students enrolled in a given school. Low density schools have less than 25 percent AI/AN students enrolled. High density schools have 25 percent or more AI/AN students enrolled.

Results are also reported in terms of five regions of the country: Atlantic, North Central, South Central, Mountain, and Pacific. The NIES regions are based on U.S. Census divisions and are defined to align with the distribution of the AI/AN student population. Like the national results, the regional data are based on the sample drawn from public, BIE, Department of Defense, and private schools. See figure 1 for a map of the regions.

Figure 1. **Regions and selected states for the National Indian Education Study: 2007**



NOTE: Selected states are identified using abbreviations. These states were identified by NAEP as having a relatively large proportion of American Indian/Alaska Native students as a percentage of the state's total population. Regions referenced in this figure were defined by NAEP exclusively for the National Indian Education Study.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

About This Report

This report describes the reading and mathematics performance of AI/AN fourth- and eighth-grade students by examining 2007 NAEP results for the nation, for regions, for selected states, and for groups of students defined by race/ethnicity, eligibility for free/reduced-price school lunch, gender, type of school location, type of school, and school density. Results are also compared to those from the 2005 assessments.

AI/AN student performance is compared to the performance of all other students in the nation or region. In addition, the sections discussing state results compare the performance results of AI/AN students within each state to those of AI/AN students in each of the other selected states, and to the performance of the national sample of AI/AN students.

Information is also provided about the design of the reading and mathematics assessments, including the frameworks, item maps, and sample questions. The Technical Notes discuss the technical procedures used for sampling and data collection and define the reporting variables.

Reporting NAEP Results

The students selected to take the NAEP assessment represent all fourth- and eighth-grade students across the United States. Students who participate in NAEP play an important role by demonstrating the achievement of our nation's students and representing the success of our schooling. NAEP data can only be obtained with the cooperation of schools, teachers, and students nationwide.

Understanding NAEP Results

Results in this report are presented in two ways: in terms of scale scores and as the percentage of students scoring at or above the three NAEP achievement levels. The average scale scores represent how students performed on the assessment. The achievement levels represent how that performance measured up against achievement expectations. Thus, the average scale scores represent what students know and can do, while the achievement-level results indicate the degree to which student performance meets expectations of what they should know and be able to do.

Scale Scores

NAEP average reading and mathematics scores are reported for grades 4 and 8 on separate 0–500 scales. Scale score results also are presented for students at various percentiles. An examination of scores at different percentiles on the 0–500 scale indicates whether or not average score results are reflected in the performance of lower-, middle-, and higher-performing students. Because NAEP scales are developed independently for each subject, average scores cannot be compared across subjects even when the scales have the same range.

Achievement Levels

NAEP results are reported at three achievement levels: *Basic*, *Proficient*, and *Advanced*. Achievement levels are performance standards defining what students should know and be able to do. They are set by the National Assessment Governing Board, based on recommendations from panels of educators and members of the public, to provide a context for interpreting student performance on NAEP. Achievement-level results are reported as percentages of students performing at or above *Basic*, at or above *Proficient*, and at *Advanced*.

As provided by law, the National Center for Education Statistics (NCES), upon review of congressionally mandated evaluations of NAEP, has determined that achievement levels are to be used on a trial basis and should be interpreted with caution. The NAEP achievement levels have been widely used by national and state officials.

NAEP ACHIEVEMENT LEVELS

Basic denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at a given grade.

Proficient represents solid academic performance. Students reaching this level have demonstrated competency over challenging subject matter.

Advanced represents superior performance.

http://nces.ed.gov/nationsreportcard/reading/achieve.asp

http://nces.ed.gov/nationsreportcard/mathematics/achieve.asp

Item Maps

Item maps provide another way to interpret the average scores and achievement-level results for each grade. The item maps displayed in this report show concrete examples of what students at various achievement levels are likely to know and be able to do on NAEP reading and mathematics questions at different points on the 0–500 scales.

Interpreting Results

Comparisons over time or between groups are based on statistical tests that consider both the size of the differences and the standard errors of the statistics being compared. Standard errors represent the amount of uncertainty in estimates that are based on a sample instead of the entire population of interest. Estimates based on smaller groups are likely to have larger standard errors. The size of the standard errors may also be influenced by other factors such as how representative the students assessed are of the entire population.

When an estimate has a large standard error, a numerical difference that seems large may not be statistically significant. Differences of the same magnitude may or may not be statistically significant depending upon the size of the standard errors of the estimates. For example, a 2-point gain between 2005 and 2007 for non-AI/AN students may be statistically significant, while a 2-point gain for AI/AN students may not be (see figure 21 in the mathematics results section).

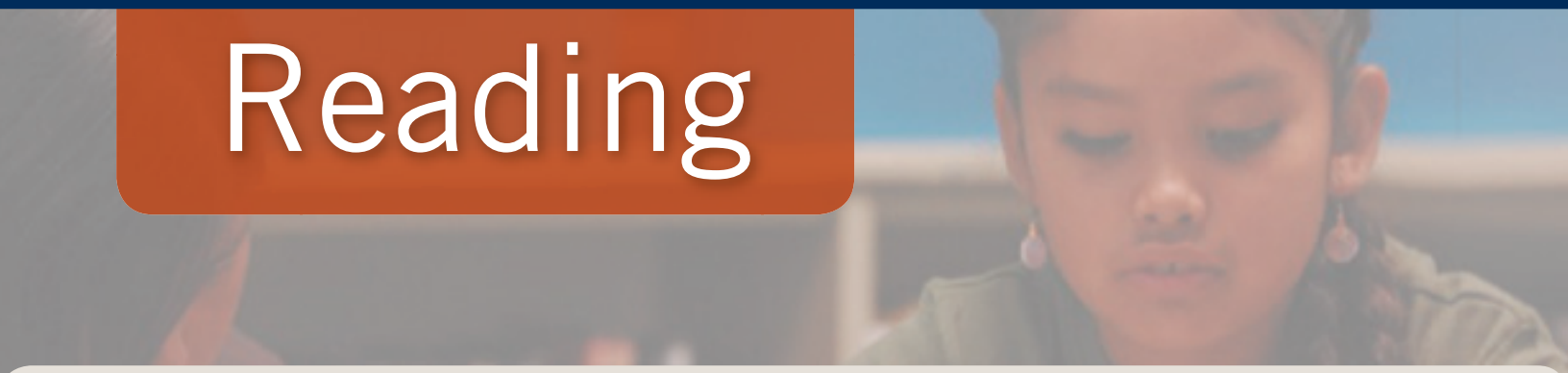
In the tables and figures in this report, the symbol (*) indicates that scores or percentages are significantly different from each other. A footnote beneath each table or figure explains which groups were compared.

Significance test results are not shown for all possible comparisons within each table or figure. NAEP results adopt widely accepted statistical standards; findings are reported based on a statistical significance level set at .05 with appropriate adjustments for multiple comparisons. Score differences or gaps cited in this report are calculated based on differences between unrounded numbers. Therefore, the reader may find that the score difference cited in the text may not be identical to the difference obtained from subtracting the rounded values shown in the accompanying tables or figures. The reader is cautioned that only those differences that are discussed in the text (for instance, a percentage or average score that is higher or lower than another), or that are indicated by the symbol (*) in the tables and figures, have been determined to be statistically significant using the criteria established for this report.

Cautions in Interpretation

Changes in performance results over time may reflect not only changes in students' knowledge and skills but also other factors, such as changes in student demographics, education programs and policies (including policies on accommodations and exclusions), and teacher qualifications. In addition to the overall performance of students in the nation, regions, and selected states, results are presented by different demographic characteristics (for example, gender, race/ethnicity, or eligibility for the National School Lunch Program). These results should not be used to establish a cause-and-effect relationship between demographic characteristics and achievement. Educational and socioeconomic factors may affect student performance in many complex ways.

Reading



As the key that allows access to many forms of knowledge and information, reading literacy is a skill critical to learning. The NAEP reading assessment measures reading comprehension by asking students to read passages and answer questions about what they have read. In this way, it collects valuable information on the progress of literacy and provides a broad picture of what our nation's students are able to read and understand at specific grade levels.

The Reading Framework

The NAEP reading framework serves as the blueprint for the assessment, specifying what should be assessed. Developed under the direction of the National Assessment Governing Board, the framework reflects ideas from a variety of organizations involved in reading education, including reading experts, school administrators, policymakers, teachers, parents, and others.

The current NAEP reading framework was first used to guide the development of the 1992 assessment and has continued to be used through 2007. Updates to the framework over the years have provided more detail regarding the assessment design but have not changed the content, allowing students' performance in 2007 to be compared with previous years. For more information on the framework, see http://www.nagb.org/frameworks/reading_07.pdf.

The framework provides a broad definition of reading that includes developing a general understanding of written text, interpreting texts, and using texts for different purposes. In addition, it views reading as an interactive and dynamic process involving the reader, the text, and the context of the reading experience.

Recognizing that readers vary in their approach to reading according to the demands of any particular text, the framework specifies that reading performance be measured for both reading contexts and aspects of reading. Three *contexts for reading* provide guidance for the types of texts included in the assessment. Four *aspects of reading* provide guidance for the types of questions that are asked about the texts.

CONTEXTS FOR READING

Reading for literary experience includes exploring events, characters, themes, settings, plots, actions, and the language of literary works by reading novels, short stories, poems, plays, legends, biographies, myths, and folktales.

Reading for information involves reading materials such as magazines, newspapers, textbooks, essays, and speeches in order to better understand the world.

Reading to perform a task requires readers to apply what they learn from reading materials such as directions for repairs or games, classroom procedures, maps, and so on.

Assessment Design

Because of the large number of questions and the variety of texts included in the NAEP reading assessment, each student took just a portion of the test, consisting of two 25-minute sections or one 50-minute section. Each section contained a reading passage and a set of related questions. The passages used in the assessment reflect those typically available to students, such as collections of stories, children's magazines, or informational books. Students were asked to respond to both multiple-choice and constructed-response (i.e., open-ended) questions.

Each question in the NAEP reading assessment measured one of the aspects of reading within the broader context for reading. All three contexts for reading are assessed at grade 8, but only two—reading for literary experience and reading for information—are assessed at grade 4 (table 3). At both grades, the framework recommends that the assessment time for each aspect of reading be distributed as shown in table 4.

Table 3. **Percentage distribution of NAEP reading questions, by grade and context for reading: 2007**

Contexts for reading	Grade 4	Grade 8
Reading for literary experience	51%	36%
Reading for information	49%	40%
Reading to perform a task	†	24%

† Not applicable. Reading to perform a task was not assessed at grade 4.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.

ASPECTS OF READING

Forming a general understanding involves considering the text as a whole and having an overall understanding of it.

Developing interpretation requires extending initial impressions and linking information across parts of the text, as well as focusing on specific information.

Making reader/text connections includes linking information in the text with knowledge and experience and applying ideas to the real world.

Examining content and structure involves understanding and critically evaluating text content, features, or appropriateness.

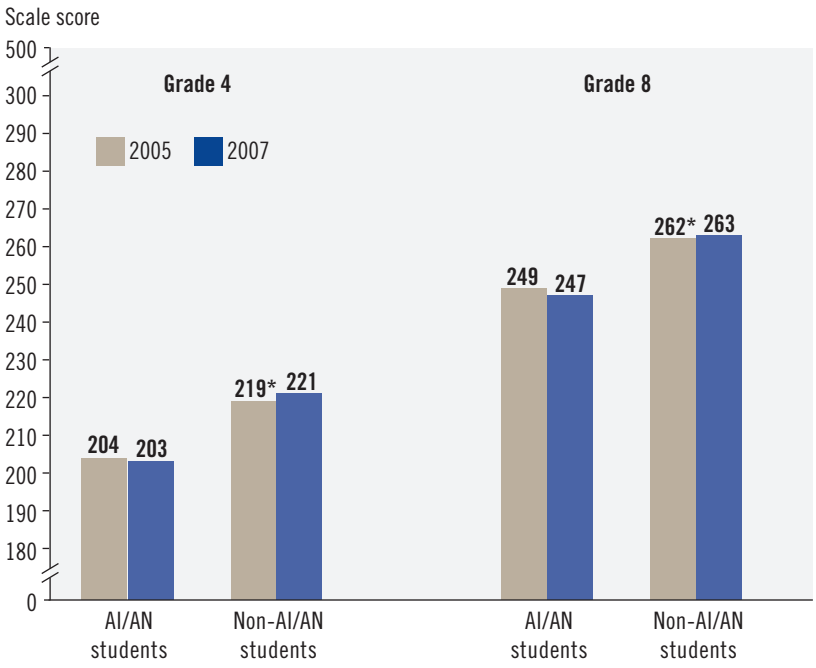
Table 4. **Target percentage of assessment time in NAEP reading, by grade and aspect of reading: 2007**

Aspects of reading	Grade 4	Grade 8
Forming a general understanding/ Developing interpretation[1]	60%	55%
Making reader/text connections	15%	15%
Examining content and structure	25%	30%

[1] For the purpose of distribution by assessment time, *forming a general understanding* and *developing interpretation* were combined as per the specifications for the assessment.
SOURCE: U.S. Department of Education, National Assessment Governing Board, Reading Framework for the 2007 National Assessment of Educational Progress (NAEP), 2006.

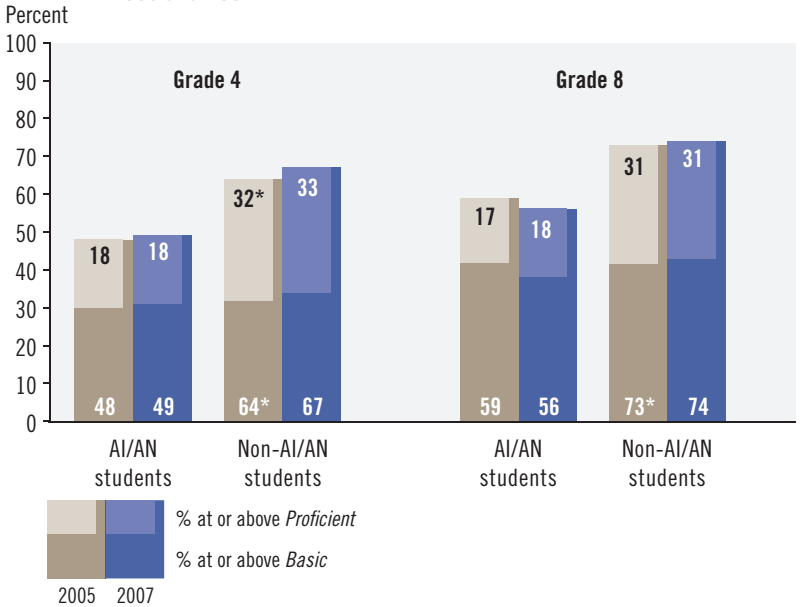
No significant change since 2005 in reading performance for American Indian/Alaska Native students

Figure 2. **Average scores in NAEP reading, by grade and student group: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

Figure 3. **Achievement-level results in NAEP reading, by grade and student group: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

The average reading scores for AI/AN fourth- and eighth-graders did not change significantly between 2005 and 2007, while scores for their non-AI/AN peers increased (figure 2). AI/AN students continued to score lower on average than non-AI/AN students in 2007.

The pattern in achievement-level results was similar to that of average reading scores. There were no significant changes between 2005 and 2007 in the percentages of AI/AN students performing at or above *Basic* and at or above *Proficient* for either grade (figure 3). Over the same time period, the percentages of non-AI/AN fourth-graders performing at or above both achievement levels increased, as did the percentage of non-AI/AN eighth-graders performing at or above *Basic*.

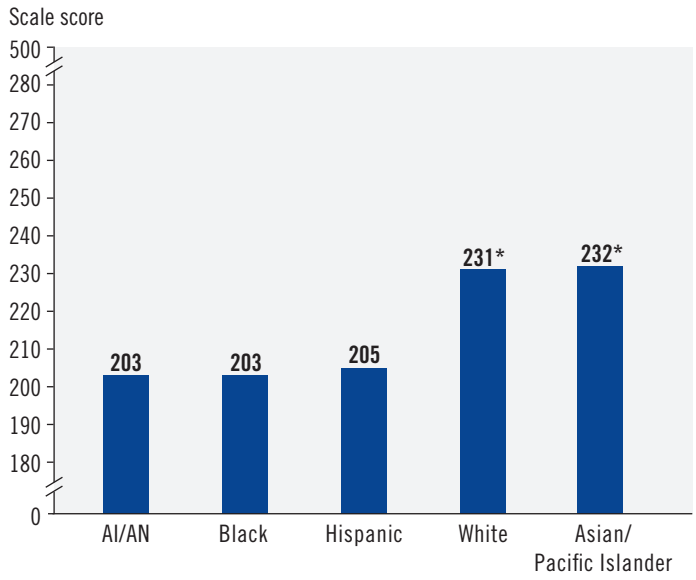
In 2007, smaller percentages of AI/AN students than non-AI/AN students performed at or above *Basic* and at or above *Proficient* at both grades.

At grade 4, AI/AN was the only one of the five racial/ethnic groups that did not show an increase in reading scores from 2005 to 2007. Since 2005, however, at grade 8, AI/AN, Hispanic, and Asian/Pacific Islander students did not show gains (data not shown).

No significant difference in average scores between AI/AN and Black or Hispanic students

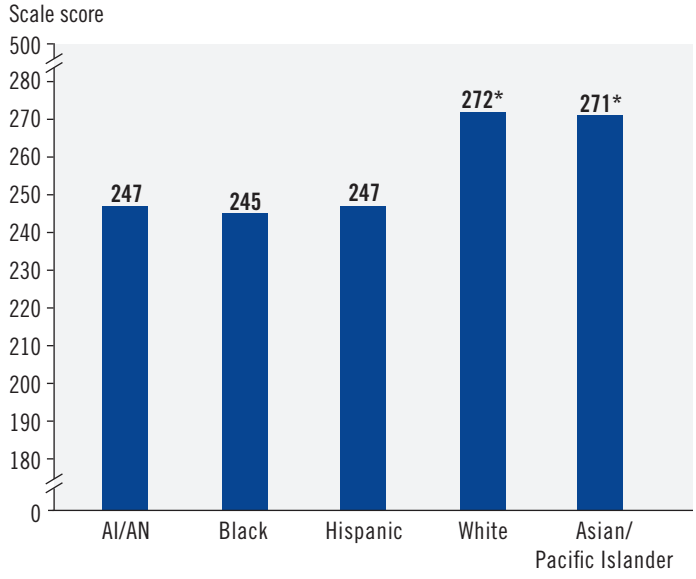
At both grades, AI/AN students scored lower than their White and Asian/Pacific Islander counterparts in 2007; however, there was no significant difference in their scores compared with Black or Hispanic students (figures 4 and 5).

Figure 4. **Average scores in NAEP reading at grade 4, by race/ethnicity: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

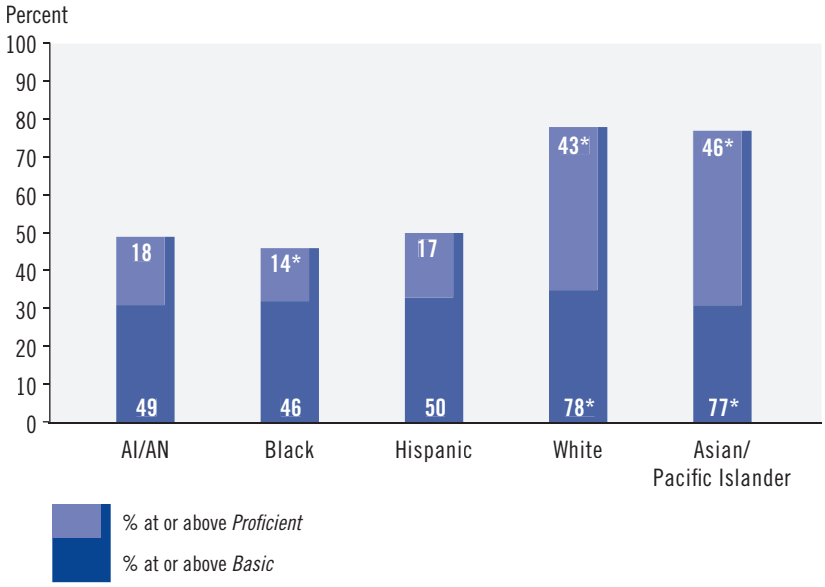
Figure 5. **Average scores in NAEP reading at grade 8, by race/ethnicity: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

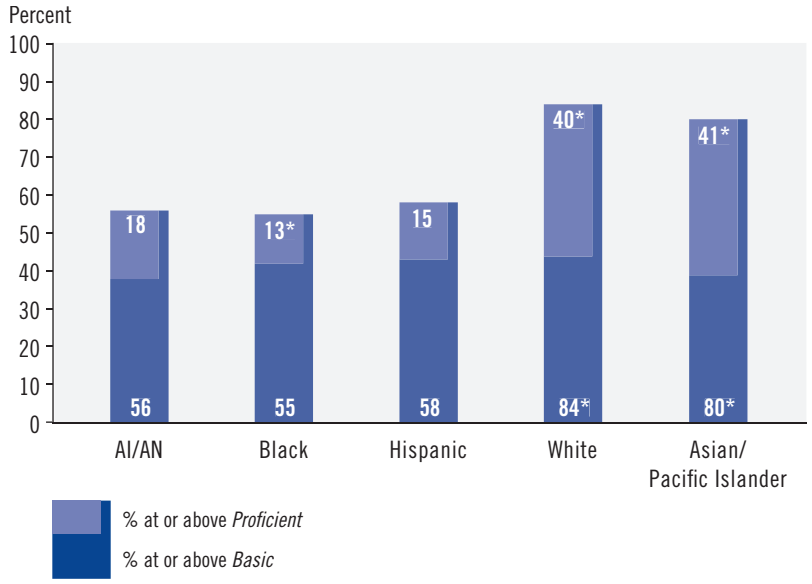
Higher percentages of AI/AN students perform at or above *Proficient* than their Black peers

Figure 6. **Achievement-level results in NAEP reading at grade 4, by race/ethnicity: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 7. **Achievement-level results in NAEP reading at grade 8, by race/ethnicity: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

In 2007, at both grades, higher percentages of AI/AN students performed at or above *Proficient* than Black students. Lower percentages of AI/AN students performed at or above both achievement levels than either White or Asian/Pacific Islander students at both grades. When comparing the reading results of AI/AN and Hispanic students, there were no significant differences in the percentages performing at or above either achievement level at either grade (figures 6 and 7).

Highest-performing AI/AN students score higher than their Black peers

Examining performance at selected percentiles can indicate when the overall picture diverges for lower-, middle-, or higher-performing students. A percentile indicates the percentage of students whose scores fell at or below a particular score on the NAEP reading scale. For example, 50 percent of grade 4 AI/AN students scored at or below 207 (table 5), and 50 percent of grade 8 AI/AN students scored at or below 249 (table 6).

Compared to grade 4 students from other racial/ethnic groups, higher-performing AI/AN students (those at the 75th and 90th percentiles) scored higher than their Black peers. The lowest-performing AI/AN students (those at the 10th percentile) scored lower than their Black peers.

At grade 8, the highest-performing AI/AN students scored higher than their Black and Hispanic peers.

At each of the five percentiles analyzed, the score for American Indian/Alaska Native students was lower than the score for White and Asian/Pacific Islander students at both grades 4 and 8.

Table 5. **Percentile scores in NAEP reading at grade 4, by race/ethnicity: 2007**

	Percentile				
Race/ethnicity	**10th**	**25th**	**50th**	**75th**	**90th**
AI/AN	150	179	207	230	251
Black	160*	182	205	226*	244*
Hispanic	157	183	208	230	249
White	190*	211*	233*	252*	269*
Asian/Pacific Islander	187*	211*	234*	257*	275*

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Table 6. **Percentile scores in NAEP reading at grade 8, by race/ethnicity: 2007**

	Percentile				
Race/ethnicity	**10th**	**25th**	**50th**	**75th**	**90th**
AI/AN	198	224	249	272	295
Black	202	225	247	267*	285*
Hispanic	201	226	250	271	289*
White	232*	253*	274*	293*	310*
Asian/Pacific Islander	224*	250*	274*	295*	313*

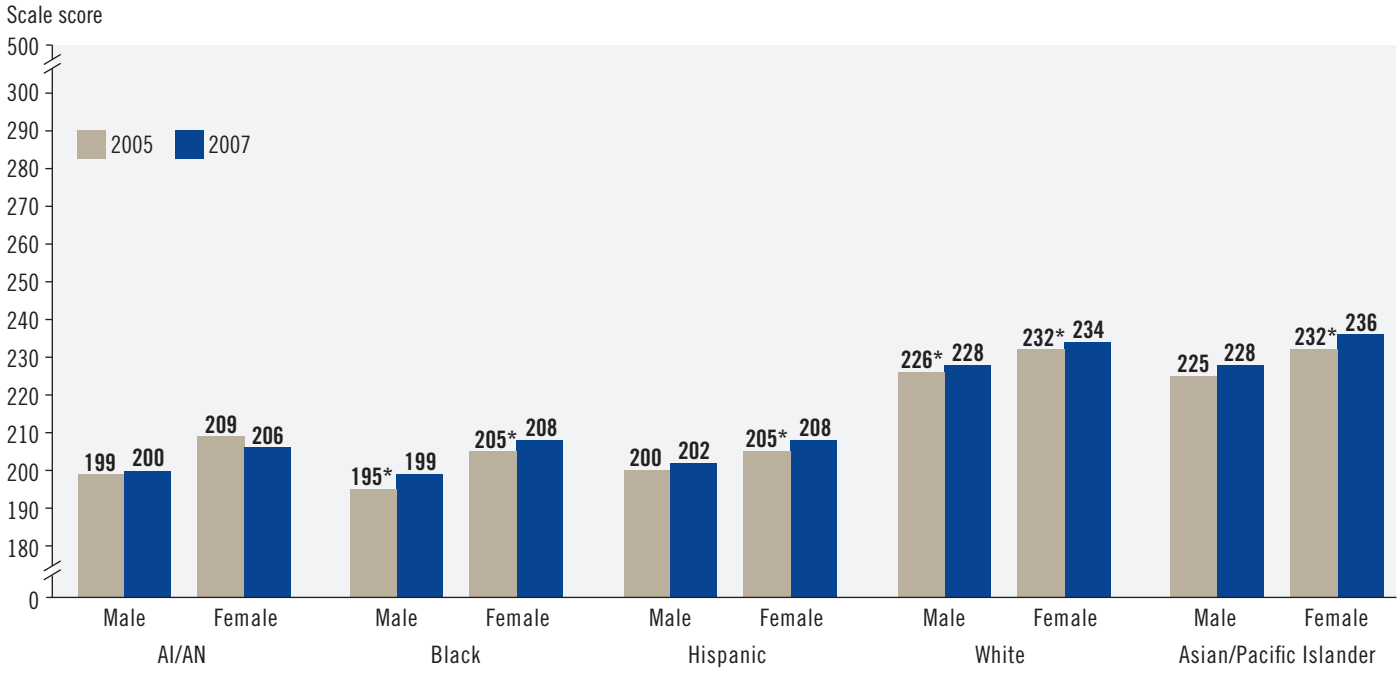
* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

AI/AN female students outscore their male peers in reading

At both grades 4 and 8, neither male nor female AI/AN students showed significant changes in average scores between 2005 and 2007 (figures 8 and 9). The results for other racial/ethnic groups varied by gender.

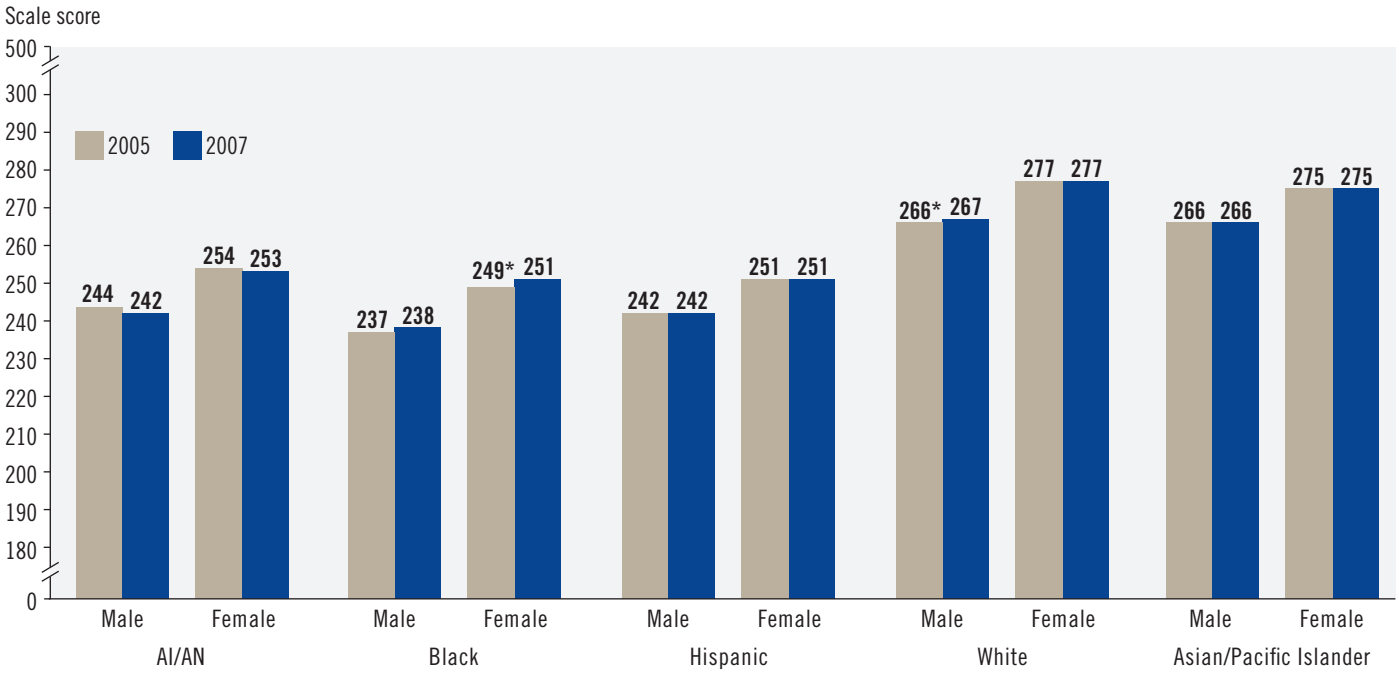
In 2007, female students had higher average reading scores than male students at both grades within each racial/ethnic group. Both male and female AI/AN students scored lower on average than their White or Asian/Pacific Islander counterparts. However, when comparing scores among AI/AN, Black, and Hispanic students, the results were not significantly different across gender groups.

Figure 8. **Average scores in NAEP reading at grade 4, by race/ethnicity and gender: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

Figure 9. **Average scores in NAEP reading at grade 8, by race/ethnicity and gender: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

Fifty-six to sixty-four percent of AI/AN, Black, and Hispanic students eligible for free school lunch

A student's eligibility for the National School Lunch Program is used as an indicator of socio-economic status; students from lower-income families are eligible for free or reduced-price school lunch. Table 7 shows the percentages of students assessed in NAEP reading by grade, race/ethnicity, and eligibility status in 2007. At grade 4, fifty-eight percent of AI/AN students, 64 percent of Black students, and 63 percent of Hispanic students assessed in reading in 2007 were eligible for free lunch. At grade 8, fifty-six percent of AI/AN students, 57 percent of Black students, and 58 percent of Hispanic students assessed in reading in 2007 were eligible for free lunch. See Technical Notes for more information about the National School Lunch Program.

Table 7. Percentage of students in NAEP reading, by eligibility for National School Lunch Program, grade, and race/ethnicity: 2007

Grade and race/ethnicity	Eligible for free lunch	Eligible for reduced-price lunch	Not eligible	Information not available
Grade 4				
AI/AN	58	8	32	2
Black	64	6	26	3
Hispanic	63	9	24	5
White	18	5	69	8
Asian/Pacific Islander	24	6	61	9
Grade 8				
AI/AN	56	7	35	2
Black	57	7	32	4
Hispanic	58	9	28	5
White	16	5	70	9
Asian/Pacific Islander	27	7	57	9

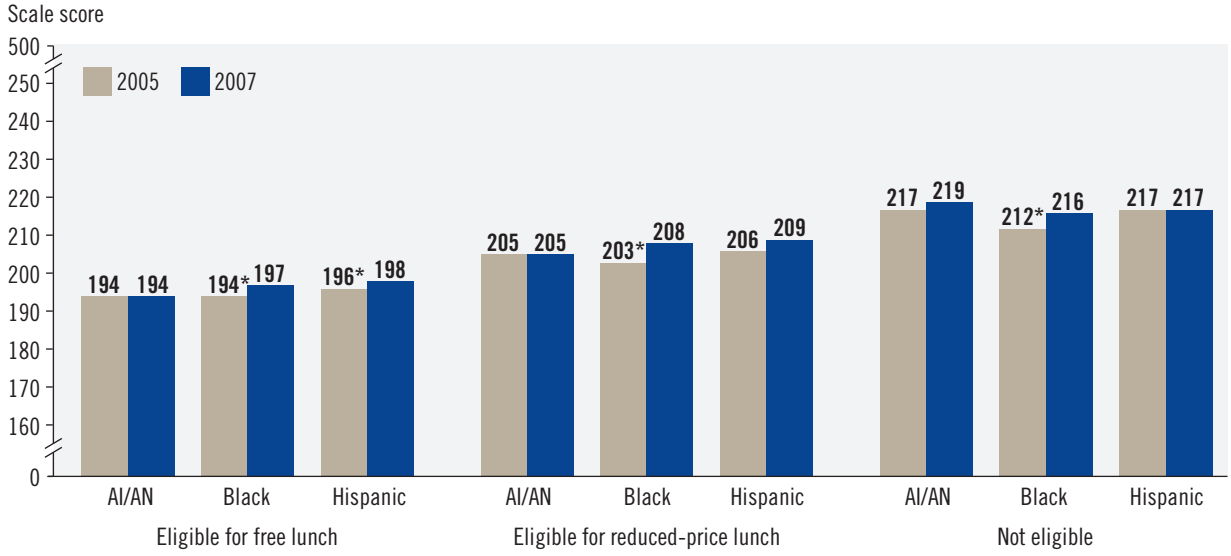
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

No significant change in scores for lower-income AI/AN students

For fourth- and eighth-grade AI/AN students, there were no significant changes in average scores between 2005 and 2007 based on students' eligibility for free or reduced-price lunch (figures 10 and 11).

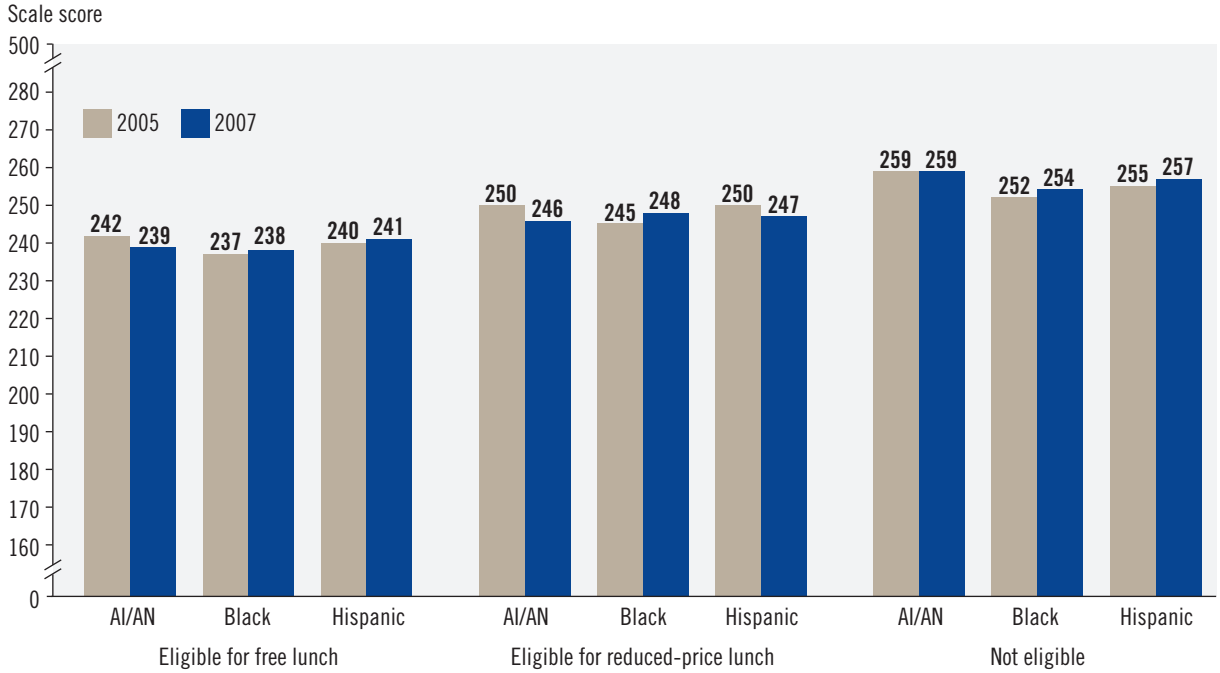
In contrast to the previous results that showed no significant differences in the average scores between AI/AN and Black or Hispanic students, the average reading score in 2007 for fourth-grade AI/AN students eligible for free lunch was lower than the scores for their Black and Hispanic peers. At grade 8, AI/AN students had higher average scores when compared to Black students in the not eligible category in 2007.

Figure 10. **Average scores in NAEP reading at grade 4, by eligibility for National School Lunch Program and selected race/ethnicity categories: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

Figure 11. **Average scores in NAEP reading at grade 8, by eligibility for National School Lunch Program and selected race/ethnicity categories: 2005 and 2007**



NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

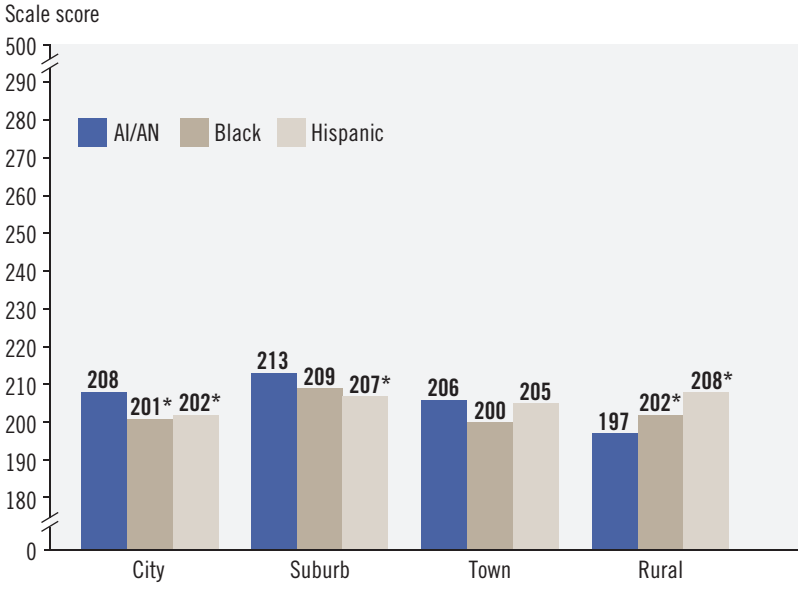
In city schools, AI/AN fourth-graders score higher than Black and Hispanic peers

NAEP reports student achievement results for four types of school locations: city, suburb, town, and rural. The comparison of reading achievement by AI/AN students and their Black and Hispanic counterparts varies depending on the location of the students' schools. At grade 4, AI/AN students attending schools in city locations had higher reading scores than their Black and Hispanic peers attending schools in city locations. AI/AN fourth-graders attending schools in suburban locations also outperformed Hispanic students attending suburban schools. However, AI/AN students attending schools in rural locations had lower reading scores than their Black and Hispanic peers in the same type of location (figure 12).

At grade 8, AI/AN students scored lower than Hispanic students in rural schools in 2007. The apparent differences between AI/AN and Black or Hispanic students within all other school locations were not statistically significant (figure 13).

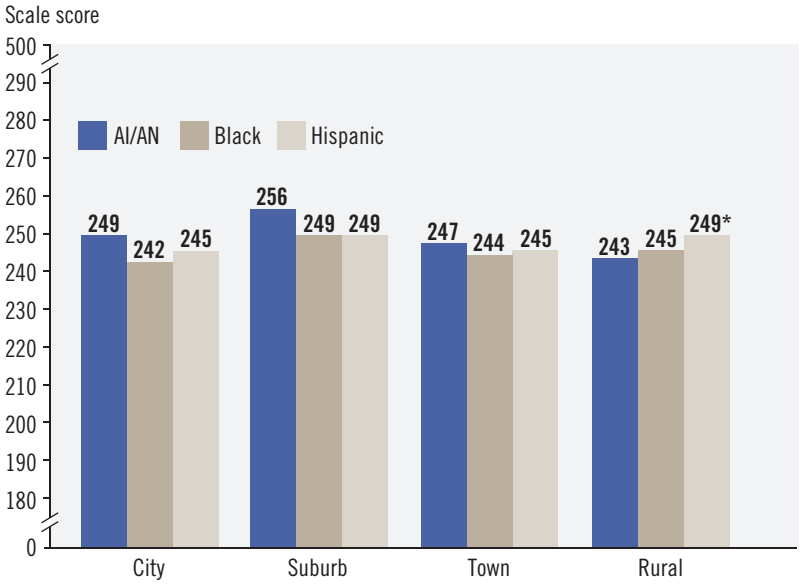
At grade 4, AI/AN students attending schools in rural locations scored lower than AI/AN students in all other types of locations in 2007. At grade 8, AI/AN students in rural settings had lower scores than their AI/AN peers in suburban schools, but not significantly different scores from their AI/AN peers attending schools in city or town locations in 2007. See Technical Notes for more information on school locations (see also table A-3).

Figure 12. **Average scores in NAEP reading for AI/AN students at grade 4, by type of school location and selected race/ethnicity categories: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 13. **Average scores in NAEP reading for AI/AN students at grade 8, by type of school location and selected race/ethnicity categories: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

AI/AN students in low density schools score higher than their peers in high density schools

School density refers to the percentage of AI/AN students enrolled in the school. High density schools are defined by the office of Indian Education as those in which at least 25 percent of students are AI/AN.

At fourth grade, 46 percent of AI/AN students assessed in NAEP reading attended high density schools in 2007, and at eighth grade, 45 percent did so (data not shown). At both grades 4 and 8, low density schools were more evenly distributed across the four school locations than were high density schools, which were concentrated in rural locations (table 8). Compared to AI/AN students in low density schools, higher percentages of AI/AN students in high density schools were identified as eligible for free/reduced-price school lunch and English language learners.

There were no significant changes in average reading scores for AI/AN students in either low or high density schools at either grade between 2005 and 2007 (figure 14).

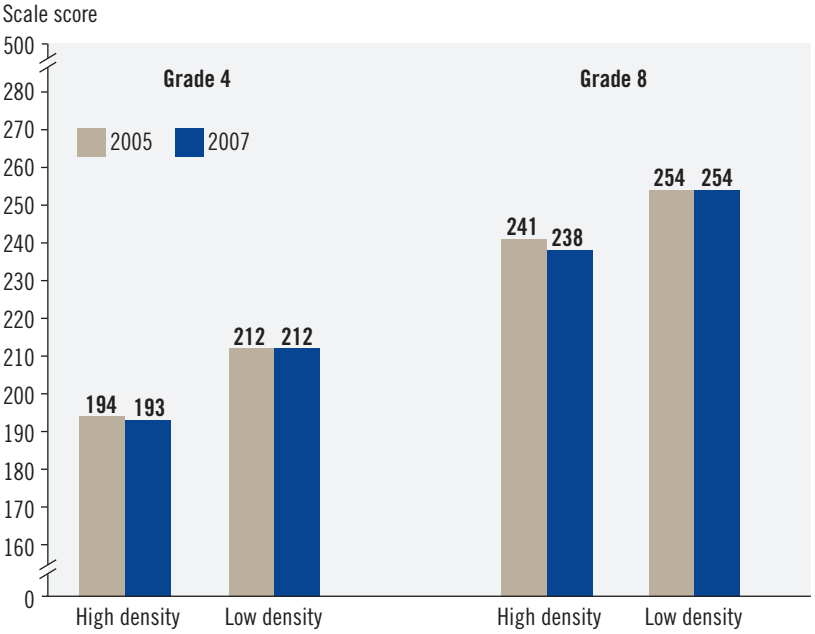
At both grades in 2007, AI/AN students at low density schools had higher average scores than their counterparts at high density schools.

Table 8. Percentage of AI/AN students in NAEP reading, by grade, school density, and selected school and student characteristics: 2007

School/student characteristics	Grade 4		Grade 8	
	High density	Low density	High density	Low density
School location				
City	2*	33	2*	29
Suburb	1*	26	1*	26
Town	24*	16	19	19
Rural	73*	25	78*	25
Eligible for free/reduced-price lunch	79*	54	77*	51
Students with disabilities	10*	13	10	13
English language learners	16*	3	15*	2

* Significantly different ($p < .05$) from AI/AN students attending low density schools.
NOTE: AI/AN = American Indian/Alaska Native. School density indicates the proportion of AI/AN students enrolled. High density schools have 25 percent or more AI/AN students. Low density schools have less than 25 percent. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 14. Average scores in NAEP reading for AI/AN students, by grade and school density: 2005 and 2007



NOTE: AI/AN = American Indian/Alaska Native. School density indicates the proportion of AI/AN students enrolled. High density schools have 25 percent or more AI/AN students. Low density schools have less than 25 percent.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

AI/AN students in public schools score higher than their peers in BIE schools

Eighty-eight to 89 percent of AI/AN students who were assessed in NAEP reading in 2007 attended public schools, and approximately 6 to 7 percent attended BIE schools (table 9-A). Ninety-three percent of AI/AN students enrolled in BIE schools were in rural locations, and 94 percent were eligible for free/reduced-price school lunch (table 9-B).

At both grades, AI/AN students who attended public schools had higher reading scores than their AI/AN peers attending BIE schools. However, at both grades, there was no significant difference in the scores of AI/AN English language learners between the two types of schools.

Table 9-A. **Percentage of AI/AN students and average scores in NAEP reading, by grade and type of school: 2007**

	Grade 4		Grade 8	
Type of school	Percentage	Average score	Percentage	Average score
Public	89	206	88	248
BIE	7*	180*	6*	228*

* Significantly different ($p < .05$) from AI/AN students attending public schools.
NOTE: AI/AN = American Indian/Alaska Native. BIE = Bureau of Indian Education. The percentages do not sum to 100 because results are not shown for Department of Defense and private schools.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Table 9-B. **Percentage of AI/AN students and average scores in NAEP reading, by type of school, grade, and selected school and student characteristics: 2007**

	Public schools		BIE schools	
Grade and school/student characteristics	Percentage	Average score	Percentage	Average score
Grade 4				
School location				
City	21	208	#	‡
Suburb	15	215	4*	‡
Town	22	206	3*	‡
Rural	42	201	93*	179*
Eligible for free/reduced-price lunch	65	198	94*	179*
Students with disabilities	12	168	9*	148*
English language learners	8	173	28*	167
Grade 8				
School location				
City	18	247	#	‡
Suburb	16	256	3*	‡
Town	21	248	5*	‡
Rural	45	247	93*	228*
Eligible for free/reduced-price lunch	62	242	94*	227*
Students with disabilities	12	214	11	194*
English language learners	7	216	16*	215

Rounds to zero.
‡ Reporting standards not met. Sample size was insufficient to permit a reliable estimate.
* Significantly different ($p < .05$) from AI/AN students attending public schools.
NOTE: AI/AN = American Indian/Alaska Native. BIE = Bureau of Indian Education. Results are not shown for Department of Defense and private schools. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

State Reading Results

Results for 11 states with relatively large populations of American Indian/Alaska Native (AI/AN) students are reported for NIES 2007. The AI/AN student enrollment in these states represents more than 50 percent of the AI/AN student enrollment in the nation. NIES state-level data include results from AI/AN students who attended public and BIE schools. The national AI/AN sample referenced as a point of comparison to these state results was also made up of public and BIE school students only.

In examining the results for the selected states, the variations in educational contexts, such as different school types, demographic factors, and socioeconomic factors, should be considered.

School and student characteristics vary by state

The following two tables show the percentage of AI/AN students within each of the selected states by a variety of school and student characteristics. The data in these two tables provide a snapshot of the diverse settings represented by the selected states.

For example, at grade 4, the percentages of AI/AN students who attended BIE schools in four of the states (Arizona, New Mexico, North Dakota, and South Dakota) ranged from 20 to 29 percent, while the other seven selected states had 6 percent or less of AI/AN students who attended BIE schools (table 10-A). The percentages of grade 8 AI/AN students who attended public schools ranged from 61 percent in South Dakota to 100 percent in Alaska, North Carolina, and Oregon.

Table 10-A. **Percentage of AI/AN students assessed in NAEP reading, by various school characteristics, grade, and selected states: 2007**

	Type of school		School location				School density	
Grade and state	Public	BIE	City	Suburb	Town	Rural	High	Low
Grade 4								
Nation	93	7	19	14	20	46	45	55
Alaska	100	#	24	1*	17	58*	69*	31*
Arizona	74*	26*	18	8*	9	64*	67*	33*
Minnesota	95*	5*	11	7	20	62	40	60
Montana	100	#	15	#	19	66*	71*	29*
New Mexico	71*	29*	18	7*	18	58	71*	29*
North Carolina	100	#	9*	9	20	61	60*	40*
North Dakota	80*	20*	13*	6*	10*	72*	68*	32*
Oklahoma	100	#	9*	10	35*	46	59*	41*
Oregon	100	#	24	11	38	27	17	83
South Dakota	73*	27*	12*	2*	9*	77*	78*	22*
Washington	94*	6*	27	34*	15	24*	24*	76*
Grade 8								
Nation	94	6	17	15	20	48	44	56
Alaska	100	#	20	3*	14*	64*	60*	40*
Arizona	85*	15*	17	4*	16	63*	74*	26*
Minnesota	96*	4*	22	11	13	54	36	64
Montana	98*	2*	16	2*	20	61*	63*	37*
New Mexico	80*	20*	12	4*	9*	74*	80*	20*
North Carolina	100	#	6	#	42	53	58	42
North Dakota	73*	27*	7*	7*	15	71*	70*	30*
Oklahoma	99*	1*	6*	11*	31*	52	66*	34*
Oregon	100	#	15	13	39	33	20*	80*
South Dakota	61*	39*	13	#	14	73*	75*	25*
Washington	95	5	18	39*	14	30*	15*	85*

Rounds to zero.
* Significantly different ($p < .05$) from AI/AN students in the nation.
NOTE: AI/AN = American Indian/Alaska Native. BIE = Bureau of Indian Education. School density indicates the proportion of AI/AN students enrolled. High density schools have 25 percent or more AI/AN students. Low density schools have less than 25 percent. The percentages under the type of school category may not sum to 100 because results are not shown for Department of Defense and private schools. The percentages under the school location and school density categories may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

In most of the selected states (at both grades), over 50 percent of AI/AN students attended rural schools. Fourth-grade AI/AN students who attended high density schools ranged from 17 percent in Oregon to 78 percent in South Dakota.

The percentages of AI/AN students eligible for free school lunch ranged from 46 percent in grade 8 in Oregon to 90 percent in grade 4 in South Dakota (table 10-B). The percentages of grade 4 AI/AN students identified as English language learners ranged from 1 percent (Washington) to 39 percent (New Mexico). At grade 8, the percentages of AI/AN students identified as English language learners ranged from 1 percent (Oklahoma) to 37 percent (Alaska).

Table 10-B. **Percentage of AI/AN students assessed in NAEP reading, by various student characteristics, grade, and selected states: 2007**

Grade and state	Eligibility for National School Lunch Program			Students with disabilities	English language learners
	Eligible for free lunch	Eligible for reduced-price lunch	Not eligible		
Grade 4					
Nation	59	8	32	12	9
Alaska	62	5	31	15	25*
Arizona	74*	7	16*	11	20*
Minnesota	57	2	40	15	3*
Montana	71*	7	22*	11	27*
New Mexico	88*	#	12*	9	39*
North Carolina	60	12	28	17	#
North Dakota	84*	3*	13*	14	5*
Oklahoma	52*	11*	37	11	#
Oregon	52	22	26	18	11
South Dakota	90*	#	10*	11	10
Washington	55	4	40	13	1*
Grade 8					
Nation	56	7	35	12	8
Alaska	55	5*	39	14	37*
Arizona	67	9	23*	8	11
Minnesota	74*	#	26	16	#
Montana	61	10	29	17	30*
New Mexico	84*	2*	13*	10	31*
North Carolina	61	8	30	9	#
North Dakota	81*	#	19*	11	12
Oklahoma	49*	11*	40	11	1*
Oregon	46	13	41	12	5
South Dakota	79*	2*	19*	10	5*
Washington	51	6	43	12	2*

Rounds to zero.
* Significantly different ($p < .05$) from AI/AN students in the nation.
NOTE: AI/AN = American Indian/Alaska Native. The percentages under the eligibility for National School Lunch Program category may not sum to 100 percent because results are not shown for students whose eligibility status was not available.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

AI/AN fourth-graders in Oklahoma score higher than AI/AN peers in the nation

Figure 15 shows the average reading scores of grade 4 AI/AN students in the nation and in the selected states, rank-ordered from the highest to the lowest. AI/AN students in Oklahoma had higher average scores, and AI/AN students in New Mexico, South Dakota, Alaska, and Arizona had lower average scores when compared to AI/AN students in the nation.

Figure 16 shows achievement-level results for the selected states. The percentages of AI/AN students performing at or above the *Basic* level ranged from 29 percent in Arizona to 60 percent in Oklahoma.

Figure 15. **Cross-state comparison of average scores in NAEP reading for AI/AN students at grade 4: 2007**

Jurisdiction (Average score)	Nation	Oklahoma	Other 39 states[1]	Oregon	Minnesota	Montana	Washington	North Carolina	North Dakota	New Mexico	South Dakota	Alaska	Arizona
Nation (204)		▼	▼							▲	▲	▲	▲
Oklahoma (213)	▲								▲	▲	▲	▲	▲
Other 39 states[1] (211)	▲								▲	▲	▲	▲	▲
Oregon (206)													▲
Minnesota (205)												▲	▲
Montana (204)										▲	▲	▲	▲
Washington (204)												▲	▲
North Carolina (202)												▲	▲
North Dakota (201)		▼	▼								▲	▲	▲
New Mexico (193)	▼	▼	▼			▼							
South Dakota (192)	▼	▼	▼			▼			▼				▲
Alaska (188)	▼	▼	▼		▼	▼	▼	▼	▼				
Arizona (184)	▼	▼	▼	▼	▼	▼	▼	▼	▼		▼		

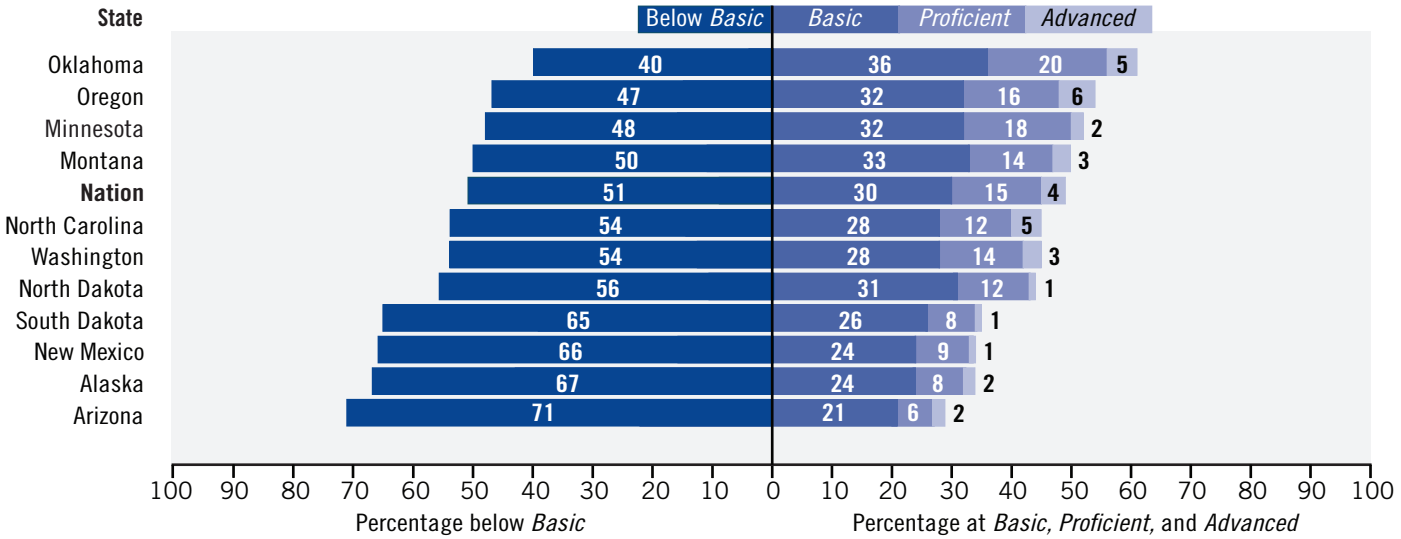
▲ The jurisdiction had a higher average score than the jurisdiction listed at the top of the column.

No statistically significant difference detected from the jurisdiction listed at the top of the column.

▼ The jurisdiction had a lower average score than the jurisdiction listed at the top of the column.

[1] The "other 39 states" category includes all states not shown and the District of Columbia.
NOTE: AI/AN = American Indian/Alaska Native. Read across the row corresponding to a jurisdiction listed to the left of the chart. Match the shading intensity (and arrow direction) to the chart's key to determine whether the average score for students in this jurisdiction was found to be higher than (up arrow), not significantly different from (blank cell), or lower than (down arrow) the average score for students in the jurisdiction in the column heading.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 16. **Percentage of AI/AN students in NAEP reading at grade 4, by achievement level and selected states: 2007**



NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

AI/AN eighth-graders in Oregon and Oklahoma score higher than AI/AN peers in the nation

Compared to AI/AN grade 8 students in the nation, AI/AN students in Oregon and Oklahoma had higher average scores, and their AI/AN peers in South Dakota, Alaska, New Mexico, and Arizona had lower average scores (figure 17).

Figure 18 shows achievement-level results for the selected states. The percentages of AI/AN students performing at or above the *Basic* level ranged from 40 percent in Arizona to 69 percent in Oregon.

Figure 17. **Cross-state comparison of average scores in NAEP reading for AI/AN students at grade 8: 2007**

Jurisdiction (Average score)	Nation	Oregon	Oklahoma	Other 39 states[1]	Washington	Montana	Minnesota	North Dakota	South Dakota	North Carolina	Alaska	New Mexico	Arizona
Nation (247)		▼	▼	▼					▲		▲	▲	▲
Oregon (260)	▲							▲	▲	▲	▲	▲	▲
Oklahoma (256)	▲							▲	▲	▲	▲	▲	▲
Other 39 states[1] (253)	▲								▲	▲	▲	▲	▲
Washington (251)											▲	▲	▲
Montana (249)									▲		▲	▲	▲
Minnesota (246)												▲	▲
North Dakota (246)		▼	▼								▲	▲	▲
South Dakota (241)	▼	▼	▼	▼		▼						▲	▲
North Carolina (236)		▼	▼	▼									
Alaska (236)	▼	▼	▼	▼	▼	▼		▼					
New Mexico (233)	▼	▼	▼	▼	▼	▼	▼	▼	▼				
Arizona (232)	▼	▼	▼	▼	▼	▼	▼	▼	▼				

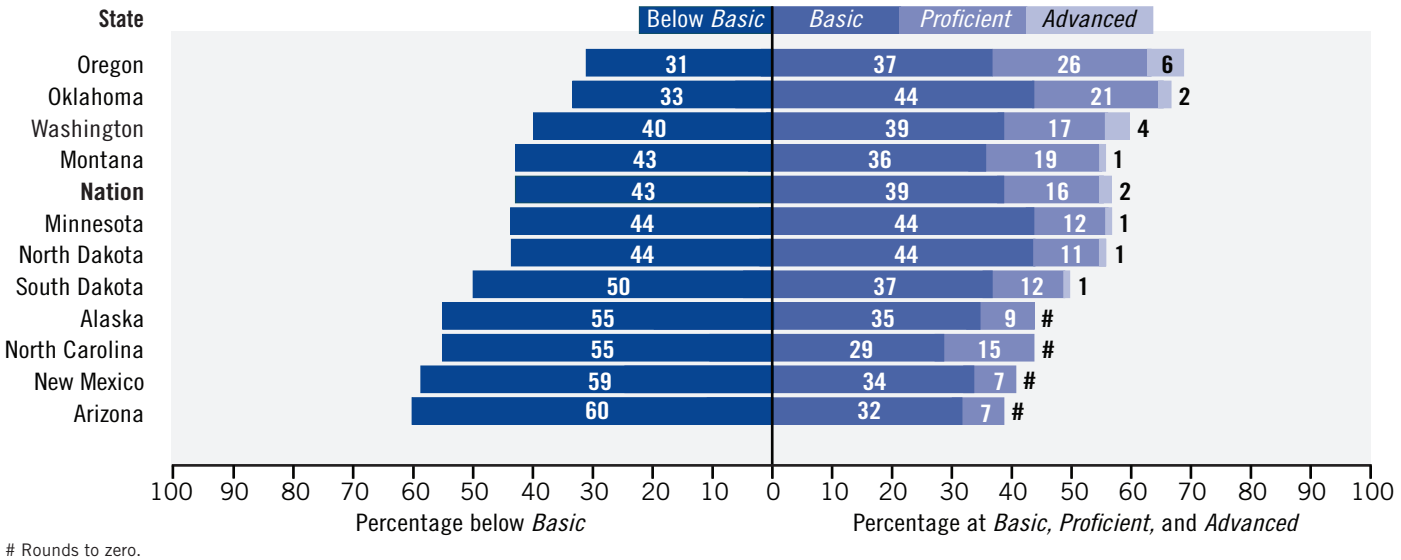
▲ The jurisdiction had a higher average score than the jurisdiction listed at the top of the column.

No statistically significant difference detected from the jurisdiction listed at the top of the column.

▼ The jurisdiction had a lower average score than the jurisdiction listed at the top of the column.

[1] The "other 39 states" category includes all states not shown and the District of Columbia.
NOTE: AI/AN = American Indian/Alaska Native. Read across the row corresponding to a jurisdiction listed to the left of the chart. Match the shading intensity (and arrow direction) to the chart's key to determine whether the average score for students in this jurisdiction was found to be higher than (up arrow), not significantly different from (blank cell), or lower than (down arrow) the average score for students in the jurisdiction in the column heading.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 18. **Percentage of AI/AN students in NAEP reading at grade 8, by achievement level and selected states: 2007**



Rounds to zero.
NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Regional Reading Results

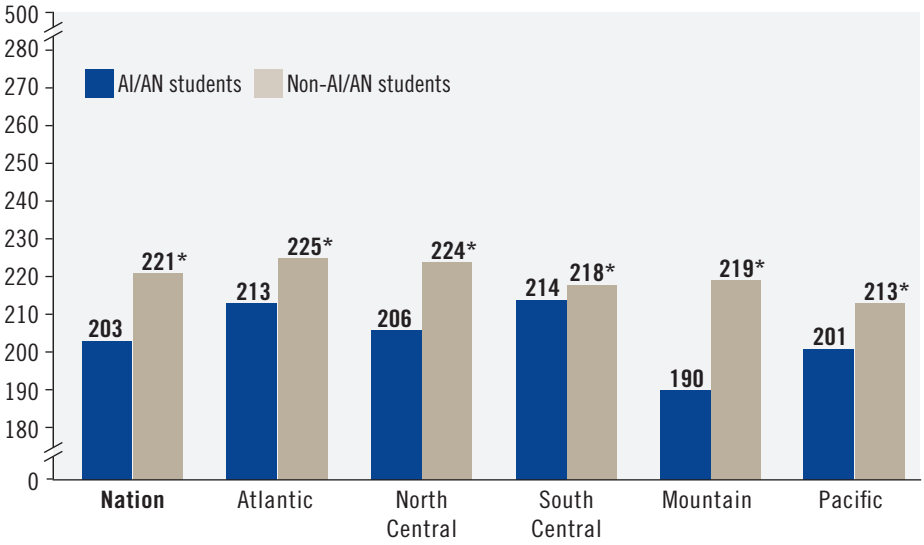
Reading results are reported for the five NIES-defined regions: Atlantic, North Central, South Central, Mountain, and Pacific. These regions, which differ from the typical regions used in other NAEP reports, are based on U.S. Census divisions and are configured to align with the overall distribution of the American Indian/Alaska Native student population. The regional results are based on samples from students enrolled in all types of schools (public, private, BIE, and Department of Defense), and reflect the combined state samples from all of the states within each region.

AI/AN results vary across regions

At grade 4, AI/AN students scored lower on average than non-AI/AN students in each of the regions (figure 19). The score gap between non-AI/AN and AI/AN students was 18 points at the national level. The score gaps in the regions ranged from 5 points (South Central) to 29 points (Mountain).

Approximately 74 percent of the grade 4 AI/AN students assessed in reading attended schools in the South Central, Mountain, and Pacific regions combined (table 11).

Figure 19. **Average scores in NAEP reading at grade 4, by region and student group: 2007**



* Significantly different ($p < .05$) from AI/AN students in the same region.
NOTE: AI/AN = American Indian/Alaska Native.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Table 11. **Percentage of AI/AN and non-AI/AN students assessed in NAEP reading at grade 4, by region: 2007**

Region	AI/AN students	Non-AI/AN students
Atlantic	10	36*
North Central	16	22*
South Central	27	18*
Mountain	29	7*
Pacific	17	17

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

With the exception of the South Central region (in which there was no significant difference in average scores), AI/AN grade 8 students in each of the regions had lower average scores than non-AI/AN students (figure 20). At the national level, the score gap between non-AI/AN and AI/AN eighth-graders was 16 points. The difference in average scores within the regions ranged from 2 points (South Central, a nonsignificant difference) to 26 points (Mountain).

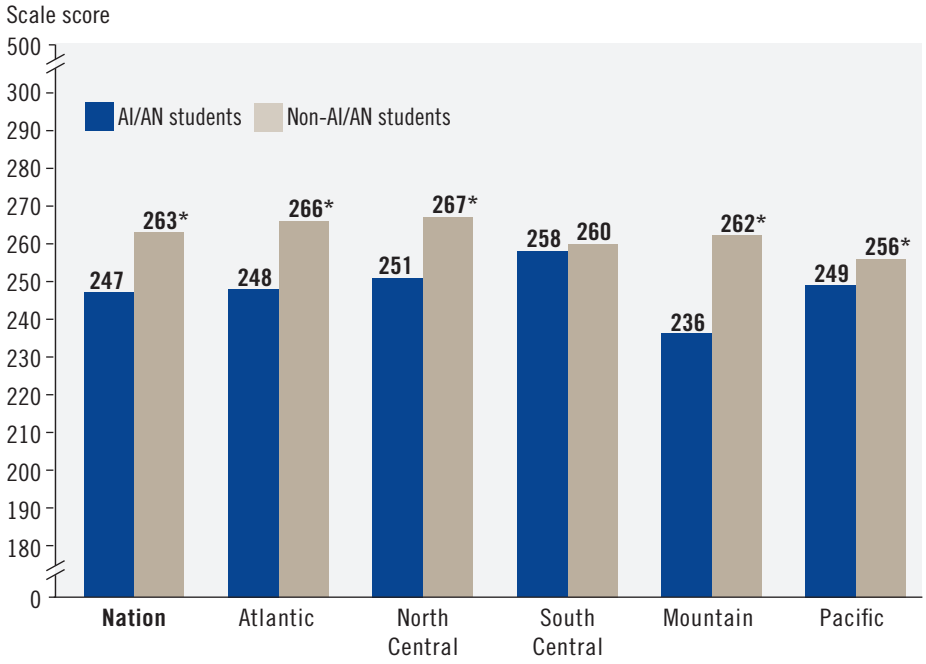
Approximately 75 percent of the grade 8 AI/AN students assessed in reading attended schools in the South Central, Mountain, and Pacific regions combined (table 12).

Table 12. **Percentage of AI/AN and non-AI/AN students assessed in NAEP reading at grade 8, by region: 2007**

Region	AI/AN students	Non-AI/AN students
Atlantic	9	37*
North Central	15	22*
South Central	21	17*
Mountain	31	7*
Pacific	23	17*

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 20. **Average scores in NAEP reading at grade 8, by region and student group: 2007**



* Significantly different ($p < .05$) from AI/AN students in the same region.
NOTE: AI/AN = American Indian/Alaska Native.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Assessment Content at Grade 4

The content of the assessment varied by grade to reflect the reading skills appropriate for each grade level, with differing proportions of assessment questions devoted to each of the contexts for reading. At grade 4, assessment questions were divided between two of the contexts for reading: reading for literary experience and reading for information, with a slightly higher proportion of assessment questions devoted to reading for literary experience. The 2007 fourth-grade reading assessment included a total of 10 reading passages and 100 questions.

READING ACHIEVEMENT LEVELS AT GRADE 4

The following descriptions are abbreviated versions of the full achievement-level descriptions for grade 4 reading. The cut score depicting the lowest score representative of that level is noted in parentheses. The full descriptions can be found at http://nces.ed.gov/nationsreportcard/reading/achieve.asp.

Basic (208): Fourth-grade students performing at the *Basic* level should demonstrate an understanding of the overall meaning of what they read. When reading text appropriate for fourth-graders, they should be able to make relatively obvious connections between the text and their own experiences and extend the ideas in the text by making simple inferences.

Proficient (238): Fourth-grade students performing at the *Proficient* level should be able to demonstrate an overall understanding of the text, providing inferential as well as literal information. When reading text appropriate to fourth grade, they should be able to extend the ideas in the text by making inferences, drawing conclusions, and making connections to their own experiences. The connections between the text and what the student infers should be clear.

Advanced (268): Fourth-grade students performing at the *Advanced* level should be able to generalize about topics in the reading selection and demonstrate an awareness of how authors compose and use literary devices. When reading text appropriate to fourth grade, they should be able to judge texts critically and, in general, give thorough answers that indicate careful thought.

What Fourth-Graders Know and Can Do in Reading

The item map below is useful for understanding performance at different levels on the scale. The scale scores on the left represent the average scores for students who were likely to get the items correct or complete. The lower-boundary scores at each achievement level are noted in boxes. The descriptions of selected assessment questions are listed in the right column and indicate what students needed to do to answer the question successfully. For example, the map on this page shows that fourth-graders performing near the middle of the *Basic* range (students with an average score of 220) were likely to be able to recognize the meaning of specialized vocabulary from context. Students performing near the lower end of the *Proficient* range (with an average score of 239) were likely to be able to identify a character's problem and describe how it was solved.

GRADE 4 NAEP READING ITEM MAP

	Scale score	Question description
	500	
Advanced	347	Integrate text ideas to provide and explain their application
	326	Evaluate titles and support judgment about them
	324	Provide text-based inference and support with story details
	302	Explain causal relation between character's action and story outcome
	290	Read across text to provide a sequence of specific information
	290	Describe change in story character and explain cause
	284	Use dialogue or action to provide inference about character trait
	277	*Recognize author's purpose for including information*
	268	Provide causal relation between text ideas
	268	
Proficient	265	Connect relevant text ideas to provide an explanation
	264	Extend text information to provide an opinion
	257	*Recognize the main purpose of an article*
	250	*Use local story context to recognize meaning of a word* (shown on page 31)
	242	Retrieve relevant information to fit description
	239	Identify character's problem and describe how it was solved
	238	*Recognize the main message of a story*
	238	
Basic	237	Use story details to infer and describe character's feelings
	236	Use character trait to make a comparison
	231	*Recognize fact supported by text information*
	226	*Recognize paraphrase of explicitly stated supporting example*
	220	*Recognize meaning of specialized vocabulary from context*
	216	*Recognize support for interpretation of character*
	209	*Recognize literal information from text*
	208	
	205	*Make simple inference to recognize relationship of picture to text*
	203	*Recognize the main topic of an article*
	200	Provide text-based explanation of character's importance to story (shown on page 32)
	193	*Recognize character's motivation for central story action*
	189	*Recognize important lesson based on story theme* (shown on page 30)
	158	Use explicitly stated information to provide character motivation (shown on page 33)
	0	

NOTE: Regular type denotes a constructed-response question. *Italic* type denotes a multiple-choice question. The position of a question on the scale represents the average scale score attained by students who had a 65 percent probability of successfully answering a constructed-response question, or a 74 percent probability of correctly answering a four-option multiple-choice question. For constructed-response questions, the question description represents students' performance rated as completely correct. Scale score ranges for reading achievement levels are referenced on the map.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.

Sample Reading Passage

The short story below is an example of what a fourth-grader might read for literary experience. The story centers around one main character and how her actions over the course of a single day bring about a change in her situation. The four sample questions that follow were based on this reading passage.

DISHPAN DUCKS

By Margaret Springer

Illustrated by Don Dyen

Rosa walked home from school slowly. The rows of apartment buildings and the streets full of cars looked all the same. And it was cold.

Rosa missed her country. She had begun to learn some English, but she did not know what to say or what to do when other kids were around. They were friendly, but Rosa felt safer being alone.

Behind Rosa's brick apartment building was a special place, a small creek where Rosa always stopped after school. There were ducks there, and she could speak to them in her language. The ducks seemed to understand.

Every afternoon Rosa sat on a concrete slab above the creek and watched the ducks until Mama came home from work.

Rosa did not feed them. She knew that most "people food" was not right for ducks. But she watched them swim and feed and walk up to her, quacking. Once they even walked over Rosa's tummy as she lay with her feet stretched out on the bumpy grass. They like me, Rosa said to herself.

One day after school, the ducks were not in the water. They did not waddle toward Rosa, even though she stayed very still. Something was wrong.

Gently, Rosa tiptoed to where the ducks were huddled. "Are you sick?" she whispered. They looked different. They looked greasy.

Then Rosa noticed the creek. An oily film covered it, making patches of color on the water's surface. She looked closely at the ducks. Their feathers were stuck together. They could not swim. They could not fly.

I must get help, said Rosa to herself. But how? I don't know anyone. Mama told me not to speak to strangers. Besides, I don't know how to ask in English.

Rosa had an idea. She rushed back to the street, walked to the traffic light, then raced around the corner and back to the school yard.

Rosa was in luck. Boys and girls were still there, practicing baseball with the gym teacher. Rosa had never played baseball in this country.

"Please! Come!" said Rosa, breathless, "Ducks!"

"Hello, Rosa," said the teacher. "What's the trouble?"

"Ducks!" said Rosa again. It was one of the few English words she was sure of. "Come. Please. Ducks!"

She pointed in the direction of the creek. The kids were staring at her, but she didn't care. "Ducks!" she said again, her eyes pleading.

The teacher said something in English to his team. They looked at Rosa and talked all at once. Then the teacher smiled. "OK, Rosa," he said. "Show us." They all grabbed their jackets and their baseball mitts and bats, and followed Rosa to the creek.

Pretty soon there were more people at Rosa's creek than she had ever seen there before. First the police came with their squad cars and sirens. Then came the firefighters with their big trucks and Humane Society workers in their vans.

People came out from the apartment building with dishpans and towels and liquid dish detergent. Rosa did not understand all the talk, but she knew what was happening.

The ducks were too weak to fly or run away. She and the other kids rounded them up and held them in the dishpans while the Humane Society people worked. Four washes for each duck with mild detergent, and four rinses with clear water. It reminded Rosa of doing the wash.

After a while someone brought a blow-dryer. Rosa laughed as the ducks were blown fluffy-dry. One by one, they were packed carefully into cages in the Humane Society vans.

"We'll keep them for a few days," one of the workers said. "They need time to regain the natural oils in their feathers, so they can keep themselves warm and swim properly. A big factory upstream spilled four hundred gallons of diesel fuel into the storm sewers last night. What a mess! You got to these ducks just in time, young lady."

Rosa did not know what the man was saying, but she saw how everyone smiled at her, and she felt proud.

By the time Rosa's mama came home, the cars and the vans and the people were gone. Rosa was in her special place by the creek. But she was not alone. She was playing baseball with three friends. Rosa was good at baseball. She was getting better at English, too.

"Home run!" she shouted, laughing, after she slugged the ball almost to the parking lot. Rosa was happy. And the dishpan ducks were safe.

Sample Question on Overall Message

This sample question asked students to use their understanding of the story to infer a possible lesson that one could learn from reading the story. This question was classified under the reading aspect, *developing interpretation*.

Seventy-seven percent of AI/AN fourth-graders selected the correct answer (choice A), recognizing the general theme underlying the story's action. Of the incorrect answers, choice B is based on literal story details and was selected by 16 percent of AI/AN fourth-graders.

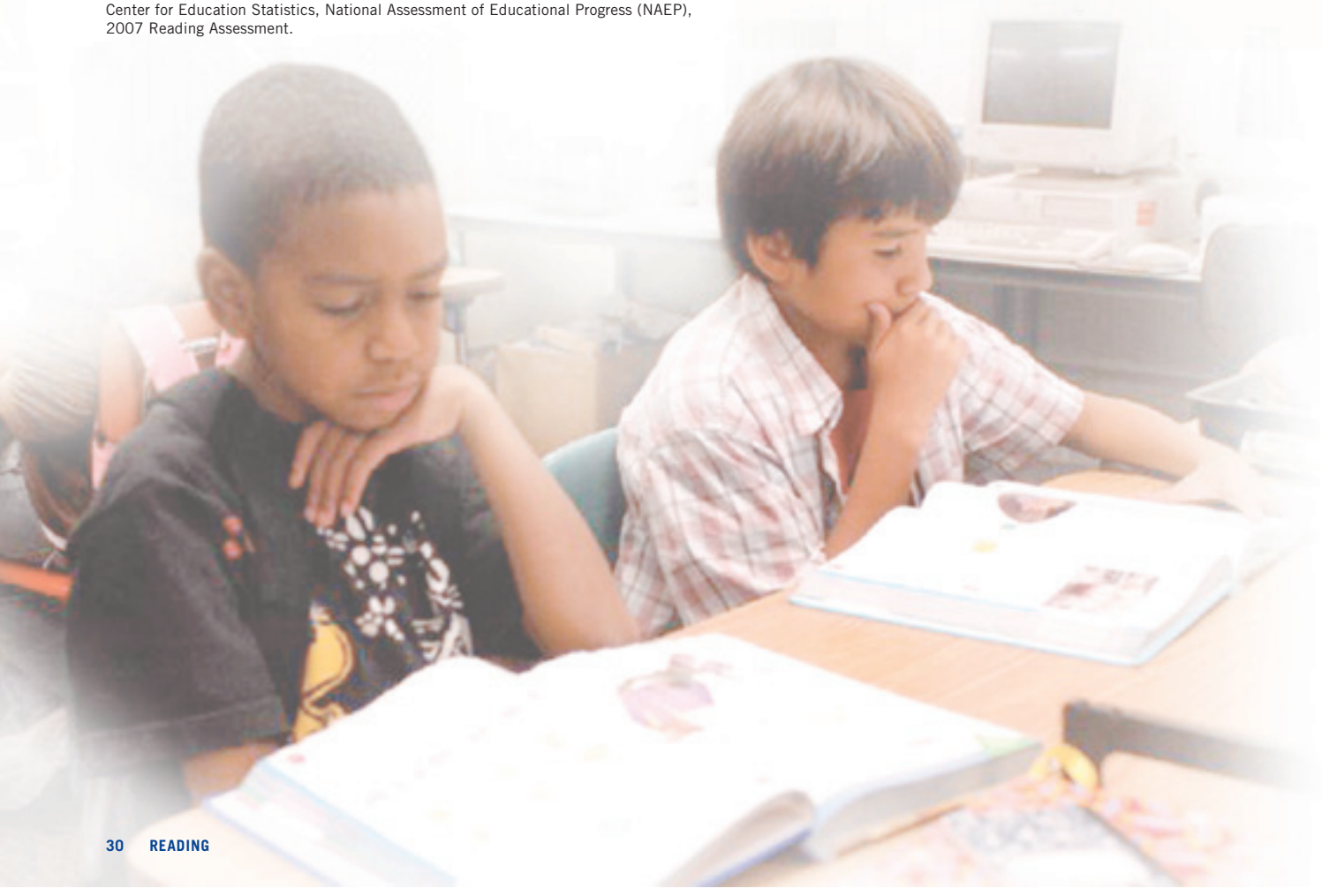
Which of the following lessons is most important to the story?

- (A) **People need to work together in an emergency.**
- (B) **Oil spills need to be cleaned up by experts.**
- (C) **Animals and people need to take baths.**
- (D) **Children need to play baseball to make friends.**

Percentage of fourth-grade students in each response category in 2007

Student group	Choice A	Choice B	Choice C	Choice D	Omitted
Nation (all students)	**82**	13	2	3	#
AI/AN students	**77**	16	3	5	#

Rounds to zero.
NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.



Sample Question on Vocabulary in Context

This sample question asked fourth-graders to use their understanding of a part of the story to identify the meaning of a word. The meaning is related to a major event in the story. This question was classified under the reading aspect, *developing interpretation*.

Forty-four percent of AI/AN fourth-graders selected the correct answer (choice B), demonstrating their understanding that the main character knows only a few English words and so uses her eyes to ask for help with the emergency. Of the incorrect answers, choices C and D, which are ordinary functions of the eyes, were selected by 49 percent of fourth-graders identified as AI/AN.

What does the word "pleading" mean, as it is used in the sentence below? *"Ducks," she said again, her eyes pleading.*

- (A) **Yelling**
- (B) **Begging**
- (C) **Looking**
- (D) **Blinking**

Percentage of fourth-grade students in each response category in 2007

Student group	Choice A	Choice B	Choice C	Choice D	Omitted
Nation (all students)	7	**52**	21	20	1
AI/AN students	7	**44**	27	22	#

Rounds to zero.
NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.

Sample Question on Character Function

This sample question asked fourth-graders to use their understanding of the plot of the story to explain the importance of one of the characters. This question was classified under the reading aspect, *developing interpretation.*

Sixty-six percent of AI/AN fourth-graders' responses were rated as "Acceptable." The response on the right was acceptable as it provided both something specific that the gym teacher did, as well as a general statement about how he helped to solve the problem.

Percentage of fourth-grade students in each response category in 2007

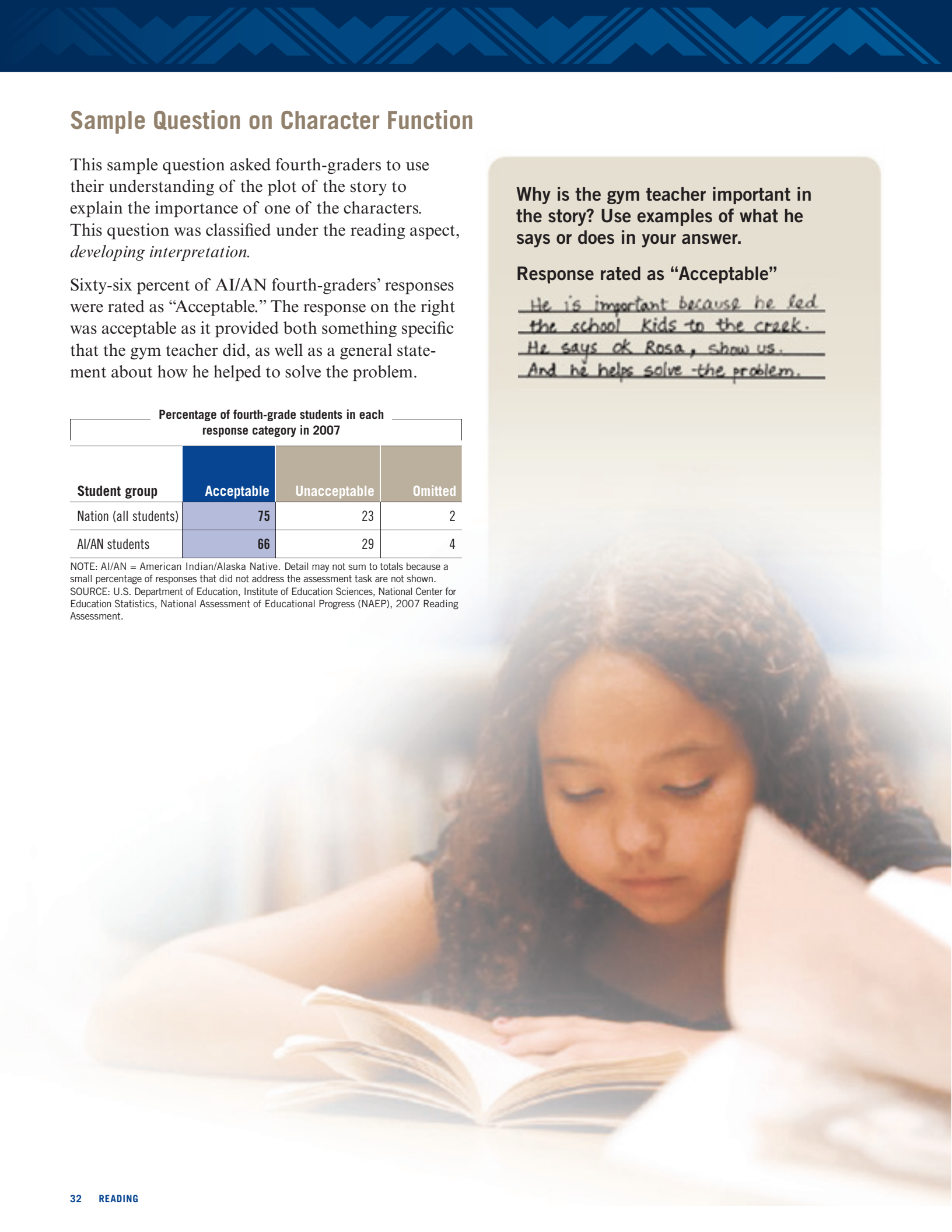
Student group	Acceptable	Unacceptable	Omitted
Nation (all students)	**75**	23	2
AI/AN students	**66**	29	4

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because a small percentage of responses that did not address the assessment task are not shown.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.

Why is the gym teacher important in the story? Use examples of what he says or does in your answer.

Response rated as "Acceptable"

He is important because he led the school kids to the creek. He says ok Rosa, show us. And he helps solve the problem.



Sample Question on Character Motivation

This sample question asked students to demonstrate their understanding of the main character by providing the motivation for an action at a particular point in the story. In addition, students needed to support their answer with details from the story. This question was classified under the reading aspect, *developing interpretation.*

Student responses for this question were rated using the following three-level scoring guide:

Full comprehension—These responses use details from the story to explain why Rosa visits the ducks at the beginning of the story.

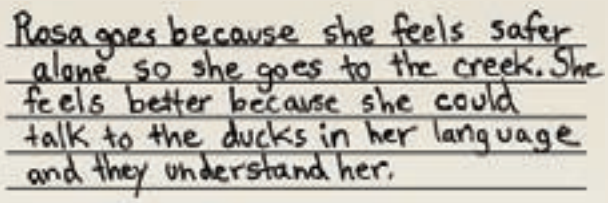
Partial or surface comprehension—These responses demonstrate a general understanding of why Rosa visits the ducks at the beginning of the story but do not support it with details from the story. Or, responses may provide a story detail related to Rosa visiting the ducks but are unrelated to why she visits them.

Little or no comprehension—These responses provide inappropriate information or personal opinions that are not related to why Rosa visits the ducks at the beginning of the story.

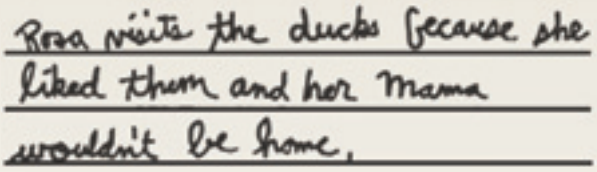
The first student response on the right was rated as "Full comprehension" because it provided both a reason why Rosa visits the ducks—"because she feels safer"—and supports it with details related to why she feels safer with the ducks. Forty-five percent of AI/AN fourth-graders provided a response rated as "Full comprehension." The second response was rated as "Partial comprehension" because it provided a story detail related to Rosa visiting the ducks at the beginning of the story. Thirty-eight percent of AI/AN fourth-graders provided a response rated as "Partial."

Explain why Rosa visits the ducks at the beginning of the story. Use details from the story in your answer.

Response rated as "Full comprehension"



Response rated as "Partial comprehension"



Percentage of fourth-grade students in each response category in 2007

Student group	Full comprehension	Partial or surface comprehension	Little or no comprehension	Omitted
Nation (all students)	**54**	34	11	1
AI/AN students	**45**	38	14	2

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because a small percentage of responses that did not address the assessment task are not shown.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.

Assessment Content at Grade 8

All three contexts for reading were assessed at grade 8. The proportion of assessment questions devoted to reading for literary experience was lower than the proportion at grade 4. At grade 8, equal proportions of assessment questions were devoted to reading for literary experience and reading for information. The remaining assessment questions were devoted to reading to perform a task, which was allotted one-half as much time as either literary or informational reading. The 2007 eighth-grade reading assessment included a total of 13 reading passages and 140 questions.

READING ACHIEVEMENT LEVELS AT GRADE 8

The following descriptions are abbreviated versions of the full achievement-level descriptions for grade 8 reading. The cut score depicting the lowest score representative of that level is noted in parentheses. The full descriptions can be found at http://nces.ed.gov/nationsreportcard/reading/achieve.asp.

Basic (243): Eighth-grade students performing at the *Basic* level should demonstrate a literal understanding of what they read and be able to make some interpretations. When reading text appropriate to eighth grade, they should be able to identify specific aspects of the text that reflect the overall meaning, extend the ideas in the text by making simple inferences, recognize and relate interpretations and connections among ideas in the text to personal experience, and draw conclusions based on the text.

Proficient (281): Eighth-grade students performing at the *Proficient* level should be able to show an overall understanding of the text, including inferential as well as literal information. When reading text appropriate to eighth grade, they should be able to extend the ideas in the text by making clear inferences from it, by drawing conclusions, and by making connections to their own experiences—including other reading experiences. *Proficient* eighth-graders should be able to identify some of the devices authors use in composing text.

Advanced (323): Eighth-grade students performing at the *Advanced* level should be able to describe the more abstract themes and ideas of the overall text. When reading text appropriate to eighth grade, they should be able to analyze both meaning and form and support their analyses explicitly with examples from the text, and they should be able to extend text information by relating it to their experiences and to world events. At this level, student responses should be thorough, thoughtful, and extensive.

What Eighth-Graders Know and Can Do in Reading

The item map below illustrates the range of reading ability demonstrated by eighth-graders. For example, students performing in the middle of the *Basic* range (with an average score of 261) were likely to be able to identify the appropriate text recommendation for a specific situation. Students performing near the top of the *Proficient* range (with an average score of 318) were likely to be able to infer and explain traits of a character using specific examples.

GRADE 8 NAEP READING ITEM MAP

	Scale score	Question description
	500	
Advanced	**365**	*Use understanding of character to interpret author's purpose*
	357	Use examples to explain importance of setting to plot
	337	Search dense text to retrieve relevant explanatory facts
	329	Recognize narrative device and explain function in story
	326	Follow directions to fully complete task
	323	
Proficient	**321**	Integrate story details to explain central conflict
	318	Use specific examples to infer and explain character traits (shown on page 41)
	315	Apply text information to real life situation
	312	Infer and provide lesson based on historical biography
	308	Describe difficulty of a task in a different context
	299	*Recognize explicit information from highly detailed article* (shown on page 39)
	298	Use metaphor to interpret character
	293	*Recognize author's device to convey information related to a task*
	288	*Identify genre of story*
	284	*Recognize what story action reveals about a character*
	281	
Basic	**279**	Use task directions and prior knowledge to make a comparison
	278	Infer character's action from plot outcome
	272	Describe central problem faced by the main character
	265	*Recognize author's purpose for including a quotation* (shown on page 38)
	262	*Identify causal relation between historical events*
	261	*Use context to identify meaning of vocabulary*
	261	*Identify appropriate text recommendation for a specific situation*
	259	Provide specific text information to support a generalization
	253	Read across text to provide explanation
	248	*Recognize information included by author to persuade*
	244	Support opinion with text information or related prior knowledge
	243	
	235	*Recognize explicitly stated reason for action in an article*
	230	*Recognize reason for character's central emotion*
	218	*Identify inference based on part of the document*
	215	*Recognize an explicitly stated embedded detail*
	206	*Identify appropriate description of character's feelings*
	205	Use global understanding of the article to provide explanation (shown on page 40)
	0	

NOTE: Regular type denotes a constructed-response question. *Italic* type denotes a multiple-choice question. The position of a question on the scale represents the average scale score attained by students who had a 65 percent probability of successfully answering a constructed-response question, or a 74 percent probability of correctly answering a four-option multiple-choice question. For constructed-response questions, the question description represents students' performance rated as completely correct. Scale score ranges for reading achievement levels are referenced on the map.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.

Sample Reading Passage

The article below is an example of what an eighth-grader might read for information. The article uses a human interest approach to relate the investigative efforts of a middle school student and how her efforts helped her community. The four sample questions that follow were based on this reading passage.

KID FIGHTS CHEATER METERS AND WINS!

The true story of a girl with a stopwatch and a bag of nickels who uncovered a local parking scandal and helped change the laws of her state . . .

Ellie Lammer wasn't trying to spark a revolt, she just wanted a haircut. That was in the fall of 1997. Ellie was 11 years old at the time, and she was getting her tresses trimmed in her hometown of Berkeley, California. When Ellie and her mom returned to their car, they found a parking ticket stuck to the windshield. It didn't seem possible: Less than an hour earlier, Ellie had pumped an hour's worth of coins into the meter. But now the needle was at zero, and Ellie's mom owed $20.

Feeling cheated, Ellie dropped another nickel in the meter and twisted the knob. The needle clicked over to the four-minute mark. Ellie stared at her watch while her mom watched the meter. Less than three minutes later, all of the time had expired. There it was: proof that they'd been cheated. The city tore up the ticket when Ellie's mom complained about the meter.

But the experience left Ellie wondering how many other meters were inaccurate. Six months later, she decided to find out. She'd been looking around for a good science-fair project—and that meter in Berkeley still bothered her. So armed with a bag of nickels and a stopwatch, she hit the streets.

Ellie didn't have the time or money to test every meter, so she focused on a sample of 50 meters located in different parts of the city. To avoid inconveniencing motorists, she did her research after 6 P.M. and on Sundays, when the meters were not in use. She put in eight minutes' worth of nickels in each meter, then measured how much time it really gave.

The results were not pretty. Ellie's findings suggested that more than nine out of every ten meters in the city were inaccurate—and that every fourth parking meter was running out of time too quickly. With 3,600 parking meters in the city, that meant a lot of undeserved tickets. As Ellie wrote in her science-project report, "I learned which meters cheat you and which meters cheat the City of Berkeley. But I learned that almost all meters cheat someone, so beware."

When the science fair rolled around, Ellie presented her findings with computer-generated charts and graphs. Her classmates weren't very interested in her project. "It's not like they have to drive a car or put money in a parking meter," she explains. But her project was a huge hit with parents. More than 50 of them lined up that night to share their own parking-meter horror stories with Ellie.

After that, word about Ellie's meter project spread fast. Within a few weeks, Ellie got a call from local politician Diane Woolley. At the time, Berkeley was considering replacing its meters with more accurate digital ones. Ellie shared her findings at city hall, and the politicians were impressed. "We don't get reports this thorough when we pay consultants hundreds of thousands of dollars," one remarked. Based on Ellie's study, they decided to purchase 2,000 new meters.

The California state legislature also decided to crack down on cheater meters. After Ellie presented her findings, they enacted "Lammer's Law," which requires California's 26 counties to test the accuracy of parking meters. Any meter found to be inaccurate must be fixed or dismantled.

California Governor Pete Wilson signed the law on November 1, 1998. At the time, he commented, "Ellie's ingenuity and dedication has earned her the gratitude of those Californians who've dug through their purses and pockets in search of exact change to feed the meters, only to return to find their cars bearing the dreaded green envelope of a parking ticket."

Ellie became a celebrity. She was in newspapers all over the country and featured on local television news during the summer and fall of 1998. CNN did a story about her. She was even a guest on the *Late Show* with David Letterman. "It was kind of a weird moment of being a celebrity," she says.

Ellie, who's now an eighth-grader at Martin Luther King Middle School, is proud of the work she's done. But she doesn't see meter monitoring as her life's work: "Right now I don't mind being known as the parking-meter girl, but I'm sure that later in life I'll want something different."

Sample Question on Supporting Idea

This sample question asked students to take a critical perspective on a sentence from the article. The focus is not on the information itself, but on how that information functions in relation to other information in the article. This question was classified under the reading aspect, *examining content and structure.*

Fifty-nine percent of AI/AN eighth-graders selected the correct answer (choice C), recognizing that this supporting information was included to highlight the main subject of the article. Of the incorrect answers, choice B was selected by 20 percent of AI/AN eighth-graders, perhaps making a literal connection between the money amount and the word "budget."

"We don't get reports this thorough when we pay consultants hundreds of thousands of dollars."

The author included this information to

- (A) **show how the city saves money**
- (B) **describe the city budget**
- (C) **emphasize Ellie's achievement**
- (D) **criticize the city of Berkeley**

Percentage of eighth-grade students in each response category in 2007

Student group	Choice A	Choice B	Choice C	Choice D	Omitted
Nation (all students)	8	14	**72**	7	#
AI/AN students	10	20	**59**	11	#

Rounds to zero.
NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.

Sample Question on Supporting Detail

This sample question asked students to negotiate the highly detailed text to focus on specific information related to the main idea of the article. This question was classified as *developing interpretation.*

Forty-seven percent of AI/AN eighth-graders selected the correct answer (choice A), demonstrating the ability to focus on and retrieve embedded detail. Of the incorrect answers, chosen most was option C, explicit numerical information about the meters.

Percentage of eighth-grade students in each response category in 2007

Student group	Choice A	Choice B	Choice C	Choice D	Omitted
Nation (all students)	**52**	14	30	4	#
AI/AN students	**47**	14	36	3	#

Rounds to zero.
NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.

According to the article, what did Ellie learn from doing her meter project?

- (A) **Every fourth meter ran too quickly.**
- (B) **Nine out of ten digital meters were accurate.**
- (C) **3,600 parking meters were inaccurate.**
- (D) **Almost none of the 50 meters ran too slowly.**

Sample Question on Major Idea

This sample question asked students to use their understanding of Ellie Lammer's accomplishments to explain why her meter project attracted attention. This question was classified under the reading aspect, *developing interpretation.*

Eighty-five percent of AI/AN eighth-graders' responses were rated as "Acceptable," as they provided a text-based explanation that connected the success of Ellie's meter project to the major idea of her discovery of the faulty meters.

Percentage of AI/AN eighth-grade students in each response category in 2007

Student group	Acceptable	Unacceptable	Omitted
Nation (all students)	**88**	10	1
AI/AN students	**85**	12	1

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because a small percentage of responses that did not address the assessment task are not shown.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.

Why did Ellie's meter project attract so much attention? Explain why, using information from the article.

Response rated as "Acceptable"

Ellie's meter project attracted so much attention because other people also had the experience of being cheated like parents and they wanted to share their stories with her. It also attracted attention because well-paid adults couldn't figure it out and an eleven year old did.

Sample Question on Drawing Conclusions

This sample question asked students to consider specific information provided in the article and to draw a conclusion from this information about the character of the person discussed in the article. This question was classified under the reading aspect, *developing interpretation.*

Student responses to this question were rated using the following four-level scoring guide:

Extensive—Responses use information in the article to provide a description of Ellie Lammer. Responses at this level provide at least two specific text-based examples of things that she did and explain what those things say about her character.

Essential—Responses at this level provide one example of something Ellie Lammer did and explain what that says about her character. Responses at this level may provide a generalization about Ellie's actions without providing a specific example from the article; however, these responses do explain what her actions say about her character.

Partial—Responses at this level may focus on Ellie's actions without explaining what the actions tell about her character.

Unsatisfactory—Responses at this level demonstrate no understanding of Ellie's actions as described in the article or what those actions say about her character.

The first response on the right was rated "Extensive" because it uses two things that Ellie did as the bases for explaining two different aspects of her character. While the second response, rated "Essential," gives two aspects of Ellie's character, only the first is based on something Ellie did. Twenty-three percent of AI/AN eighth-graders provided a response rated as "Extensive" on this question.

Choose two things Ellie Lammer did and explain what those things tell about her. Use examples from the article to support your answer.

Response rated as "Extensive"

Ellie Lammer got cheated out of her money, and then decided that she wasn't going to give up, she was going to do experiments and take this problem to the next level. This shows perseverance, because she chose to keep going with the problem even though it was time-consuming, to help people.

She also chose to prove the meters wrong by tieing them wing a stop watch. This shows intelligence, because she knew what methods to use in order to prove the meters inaccurate.

Response rated as "Essential"

She did her science fair project on meters to see how many other people got cheated. Which means she cares about other people and not just her self. At the end of her article It said she enjoyed being a super star, but wanted something more in life. She wants to be someone important.

Percentage of eighth-grade students in each response category in 2007

Student group	Extensive	Essential	Partial	Unsatisfactory	Omitted
Nation (all students)	32	17	41	5	5
AI/AN students	23	15	48	7	6

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because a small percentage of responses that did not address the assessment task are not shown.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Reading Assessment.

Mathematics

The NAEP mathematics assessment was designed to measure students' knowledge and skills in mathematics and their ability to apply their knowledge and skills in problem-solving situations.

The Mathematics Framework

The NAEP mathematics framework serves as the blueprint for the assessment, describing the specific mathematical skills that should be assessed at grades 4 and 8. Developed under the direction of the National Assessment Governing Board, the framework embraces ideas and input from mathematicians, school administrators, policymakers, teachers, parents, and others.

The current NAEP mathematics framework was first used to guide the development of the 1990 assessment and has continued to be used through 2007. Updates to the framework over the years have provided more detail regarding the assessment design but have not changed the content, allowing student performance in 2007 to be compared with previous years. For more information on the framework, visit http://www.nagb.org/frameworks/math_07.pdf.

The framework details the mathematics objectives appropriate for grades 4 and 8. The topics covered by the framework include properties of numbers and operations, proportional reasoning, systems of measurement, relationships between geometric figures, data representation, probability, algebraic representations, equations and inequalities, and mathematical reasoning in various content areas.

Two dimensions of mathematics, *content areas* and *mathematical complexity*, are used to guide the assessment. Although each item is designed to measure one of the five content areas, the items will, in many cases, cross some of the boundaries of these content areas. The level of complexity of a mathematics question is determined by the cognitive demands that it places on students.

MATHEMATICS CONTENT AREAS

Number properties and operations measures students' understanding of ways to represent, calculate, and estimate with numbers.

Measurement measures students' knowledge of measurement attributes, such as capacity and temperature, and geometric attributes, such as length, area, and volume.

Geometry measures students' knowledge and understanding of shapes in a plane and in space.

Data analysis and probability measures students' understanding of data representation, characteristics of data sets, experiments and samples, and probability.

Algebra measures students' understanding of patterns, using variables, algebraic representation, and functions.

Assessment Design

Because of the breadth of the content covered in the NAEP mathematics assessment, each student took just a portion of the test, consisting of two 25-minute sections. Testing time was divided evenly between multiple-choice and constructed-response (i.e., open-ended) questions. Some questions incorporated the use of rulers (at grade 4) or ruler/protractors (at grade 8), and some questions incorporated the use of geometric shapes or other manipulatives that are provided for students. For approximately one-third of the assessment, a four-function calculator was provided for students at grade 4, and a scientific calculator was provided for students at grade 8.

The distribution of items among each content area differs somewhat by grade to reflect the knowledge and skills appropriate for each grade level. Table 13 shows the distribution across the content areas for grades 4 and 8, as recommended in the framework.

Table 13. **Target percentage of NAEP mathematics questions, by grade and content area: 2007**

Content areas	Grade 4	Grade 8
Number properties and operations	40%	20%
Measurement	20%	15%
Geometry	15%	20%
Data analysis and probability	10%	15%
Algebra	15%	30%

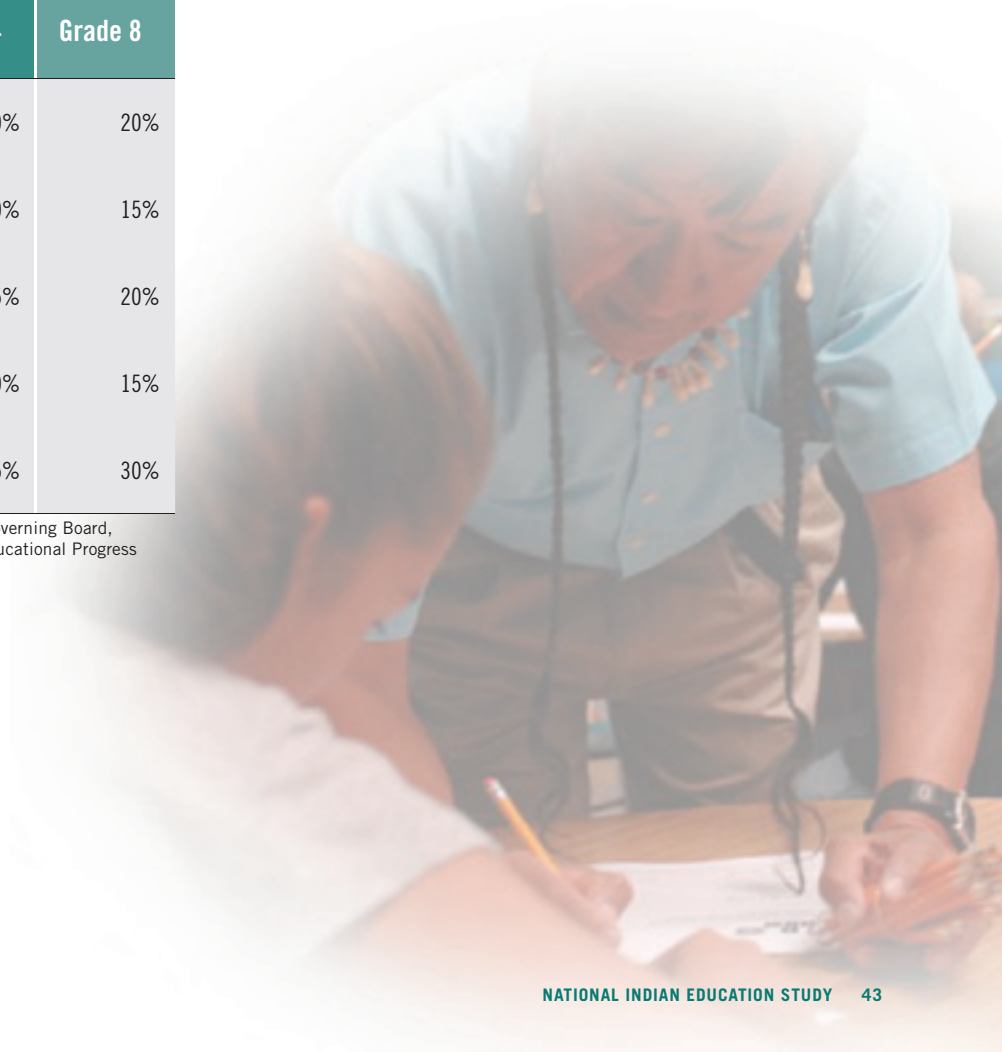
SOURCE: U.S. Department of Education, National Assessment Governing Board, Mathematics Framework for the 2007 National Assessment of Educational Progress (NAEP), 2006.

LEVELS OF MATHEMATICAL COMPLEXITY

Low complexity questions typically specify what a student is to do, which is often to carry out some routine or mathematical procedure.

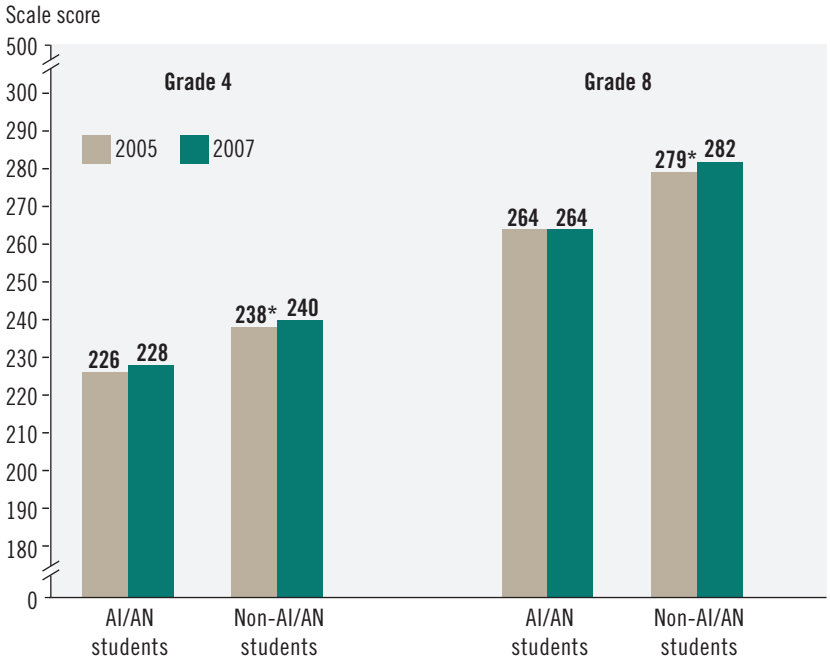
Moderate complexity questions involve more flexibility of thinking and often require a response with multiple steps.

High complexity questions make heavier demands and often require abstract reasoning or analysis in a novel situation.



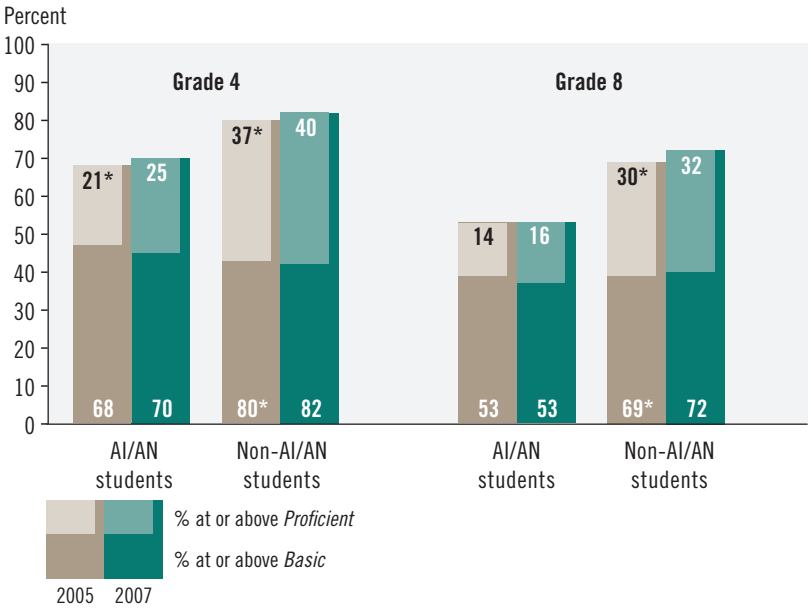
American Indian/Alaska Native fourth-graders show gains in percentage at or above *Proficient*

Figure 21. **Average scores in NAEP mathematics, by grade and student group: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

Figure 22. **Achievement-level results in NAEP mathematics, by grade and student group: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

Overall, the average mathematics scores for AI/AN fourth- and eighth-graders did not change significantly between 2005 and 2007, while the scores over the same two-year period increased for their non-AI/AN peers (figure 21). AI/AN students had lower average scores than non-AI/AN students at both grades in 2007.

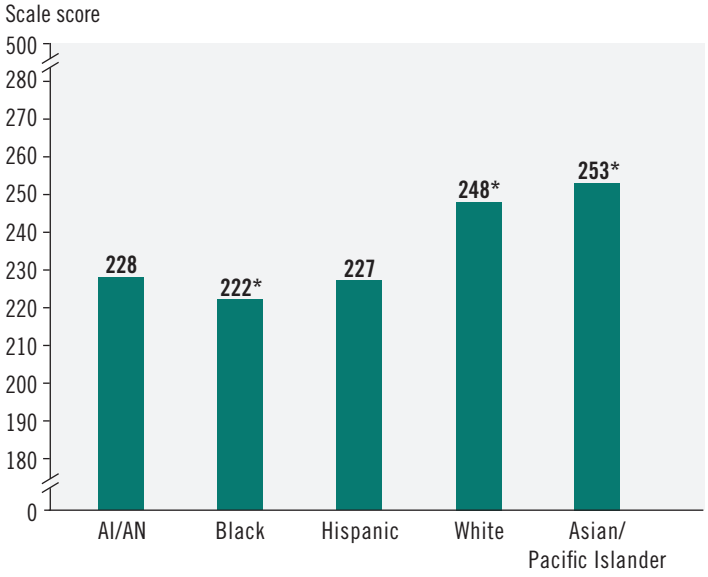
Between 2005 and 2007, AI/AN fourth-graders showed an increase in the percentage of students performing at or above *Proficient,* but eighth-graders did not (figure 22). Over the same time period, non-AI/AN students at both grades showed gains in the percentages performing at or above *Basic* and at or above *Proficient*. The percentages of AI/AN students performing at or above *Basic* and at or above *Proficient* were lower than for non-AI/AN students at both grades in 2007.

While there was no significant change in average scores for AI/AN fourth- or eighth-graders since 2005, Black, Hispanic, and White students at both grades made gains. Asian/Pacific Islander fourth-graders also made gains (data not shown).

AI/AN students score higher than Black students, but lower than White and Asian/Pacific Islander students

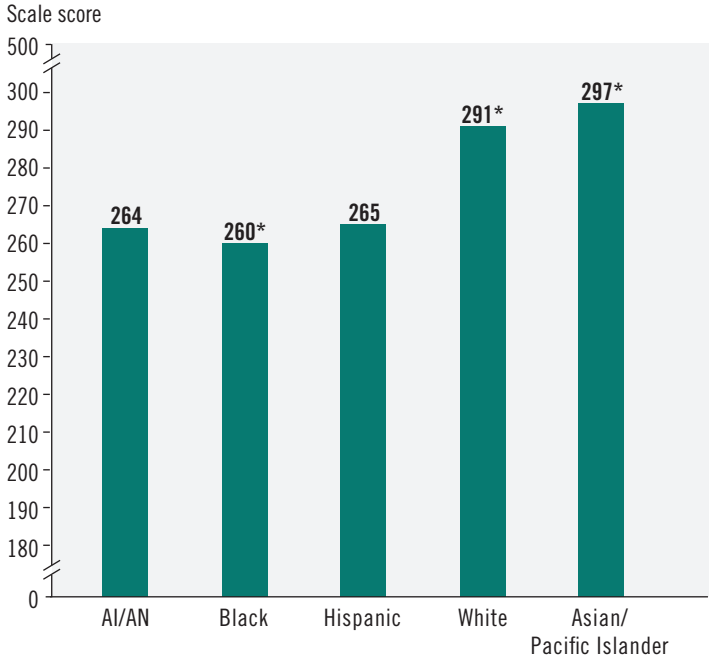
AI/AN fourth- and eighth-graders scored higher than their Black peers and lower than their White and Asian/Pacific Islander peers in 2007. There was no significant difference in scores compared with their Hispanic peers at either grade (figures 23 and 24).

Figure 23. **Average scores in NAEP mathematics at grade 4, by race/ethnicity: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

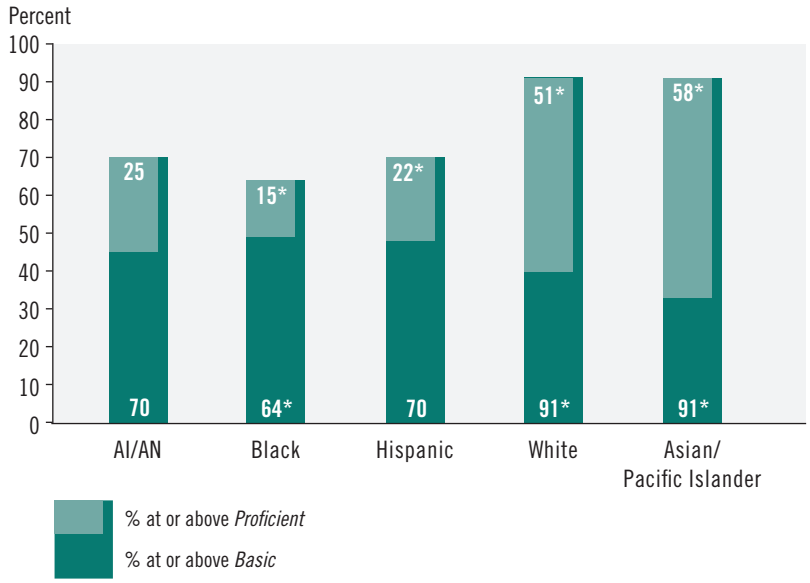
Figure 24. **Average scores in NAEP mathematics at grade 8, by race/ethnicity: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

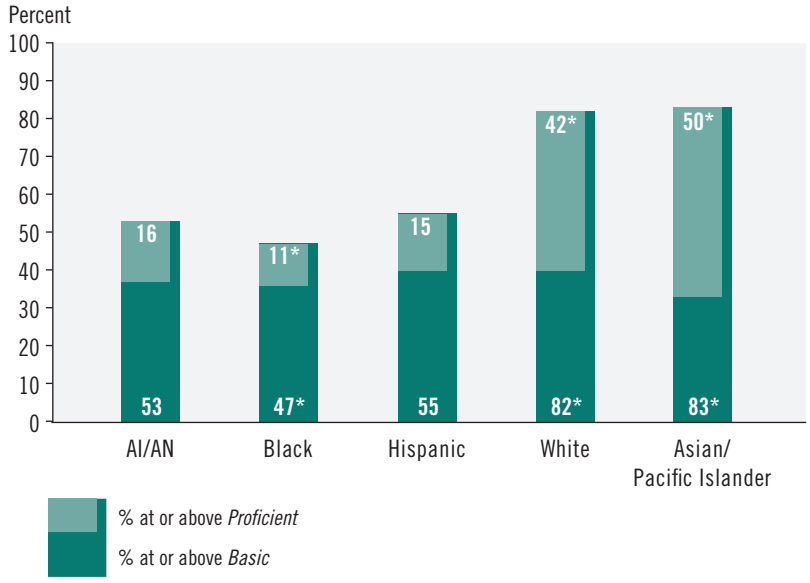
Higher percentage of AI/AN fourth-graders perform at or above *Proficient* than their Black and Hispanic peers

Figure 25. **Achievement-level results in NAEP mathematics at grade 4, by race/ethnicity: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 26. **Achievement-level results in NAEP mathematics at grade 8, by race/ethnicity: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

In 2007, AI/AN students at both grades had lower percentages at both achievement levels than either White or Asian/Pacific Islander students, but they had higher percentages at both achievement levels when compared to Black students (figures 25 and 26). AI/AN students at grade 4 had a higher percentage performing at or above *Proficient* compared to Hispanic students.

Highest-performing AI/AN students score higher than their Black peers

Examining performance at selected percentiles can indicate when the overall picture diverges by lower-, middle-, or higher-performing students. A percentile indicates the percentage of students whose scores fell at or below a particular score on the NAEP mathematics scale. For example, 50 percent of grade 4 AI/AN students scored at or below 230 (table 14), and 50 percent of grade 8 AI/AN students scored at or below 264 (table 15).

Compared to grade 4 students from other racial/ethnic groups, higher-performing AI/AN students (those at the 75th and 90th percentiles) scored higher than their Black and Hispanic peers. AI/AN students also scored higher than their Black peers at the 25th and 50th percentiles.

At grade 8, AI/AN students scored higher than their Black peers at the 50th, 75th, and 90th percentiles.

At each of the five percentiles analyzed, the score for AI/AN students was lower than the score for White and Asian/Pacific Islander students at both grades 4 and 8.

Table 14. **Percentile scores in NAEP mathematics at grade 4, by race/ethnicity: 2007**

	Percentile				
Race/ethnicity	**10th**	**25th**	**50th**	**75th**	**90th**
AI/AN	188	209	230	249	265
Black	188	205*	223*	241*	256*
Hispanic	190	209	229	247*	261*
White	216*	233*	250*	265*	279*
Asian/Pacific Islander	216*	236*	255*	273*	288*

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Table 15. **Percentile scores in NAEP mathematics at grade 8, by race/ethnicity: 2007**

	Percentile				
Race/ethnicity	**10th**	**25th**	**50th**	**75th**	**90th**
AI/AN	216	240	264	288	309
Black	218	239	260*	282*	301*
Hispanic	221	243	266	288	307
White	249*	270*	292*	314*	332*
Asian/Pacific Islander	247*	273*	299*	323*	344*

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

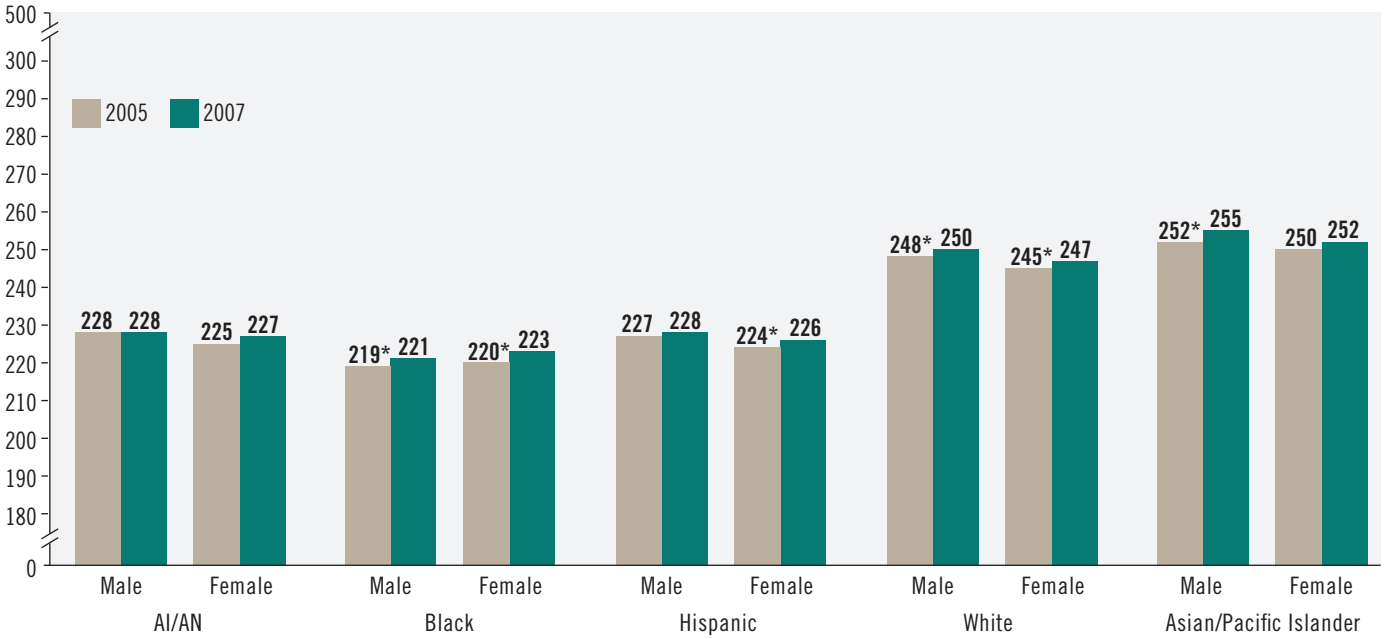
No significant score difference between male and female AI/AN students

At both grades 4 and 8, neither male nor female AI/AN students showed significant changes in mathematics average scores since 2005 (figures 27 and 28). The 2007 results for other racial/ethnic groups varied as is described below.

In 2007, at grade 4, AI/AN male and female students had higher average scores than their Black peers in 2007 and lower scores than their White and Asian/Pacific Islander peers. The average scores for AI/AN male and female students were not significantly different from their Hispanic counterparts in 2007. In addition, a male – female performance gap in mathematics was not consistently displayed across racial/ethnic groups. Hispanic, White, and Asian/Pacific Islander male fourth-graders had higher scores than their female peers. AI/AN male and female students showed no significant difference in their mathematics average scores, and Black male students scored lower than Black female students.

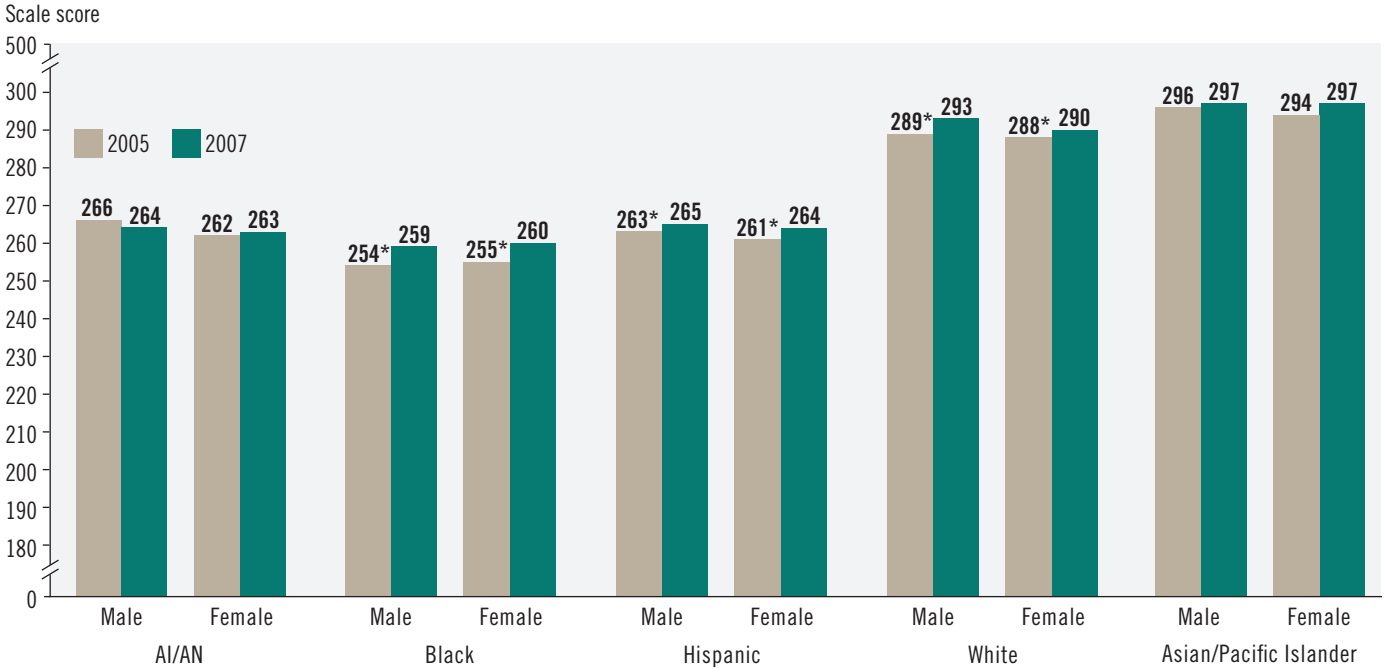
In 2007, at grade 8, AI/AN male students scored higher than Black male students, with no significant difference in the scores of AI/AN and Black female students. Only among White students did male eighth-graders outscore their female peers. For AI/AN, Black, Hispanic, and Asian/Pacific Islander eighth-graders, there was no significant difference between male and female students' average scores.

Figure 27. **Average scores in NAEP mathematics at grade 4, by race/ethnicity and gender: 2005 and 2007**

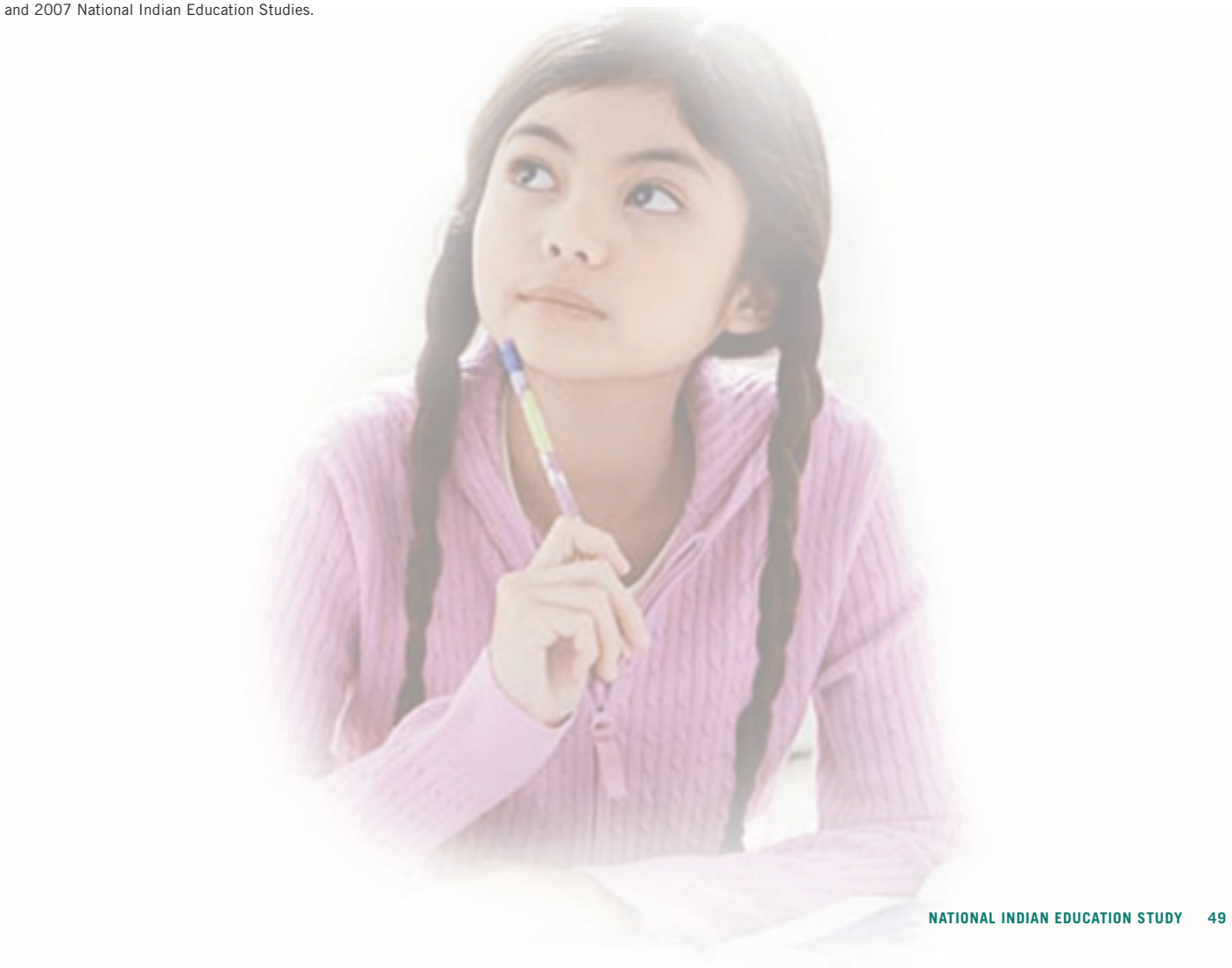


* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

Figure 28. **Average scores in NAEP mathematics at grade 8, by race/ethnicity and gender: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.



Fifty-five to sixty-four percent of AI/AN, Black, and Hispanic students eligible for free school lunch

Table 16 shows the percentage of students assessed in NAEP mathematics by grade, race/ethnicity, and eligibility for free or reduced-price school lunch in 2007. Among fourth-graders, 59 percent of AI/AN students, 64 percent of Black students, and 64 percent of Hispanic students assessed in mathematics in 2007 were eligible for free lunch. Among eighth-graders, 55 percent of AI/AN students, 58 percent of Black students, and 58 percent of Hispanic students assessed in mathematics in 2007 were eligible for free lunch. See Technical Notes for more information about the National School Lunch Program.

Table 16. Percentage of students in NAEP mathematics, by eligibility for National School Lunch Program, grade, and race/ethnicity: 2007

Grade and race/ethnicity	Eligible for free lunch	Eligible for reduced-price lunch	Not eligible	Information not available
Grade 4				
AI/AN	59	7	32	2
Black	64	7	26	3
Hispanic	64	9	23	5
White	19	5	68	8
Asian/Pacific Islander	25	6	60	10
Grade 8				
AI/AN	55	6	35	4
Black	58	7	31	4
Hispanic	58	9	28	5
White	16	5	71	9
Asian/Pacific Islander	27	6	57	10

NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

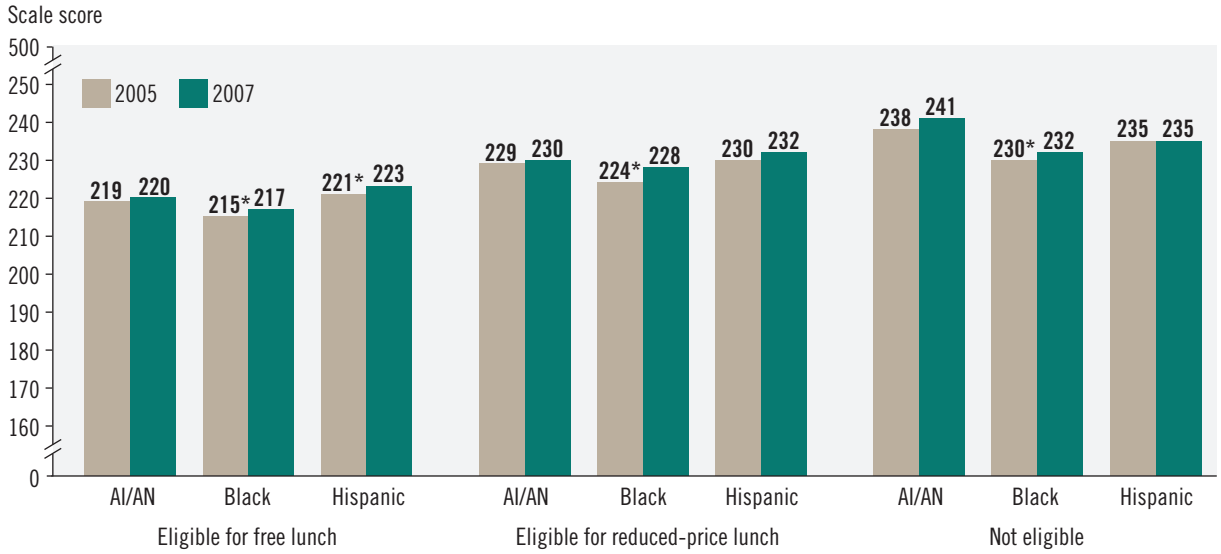
AI/AN students not eligible for school lunch program score higher than Black and Hispanic peers

There was no significant change between 2005 and 2007 in average mathematics scores for AI/AN fourth- or eighth-graders who were eligible for free or reduced-price school lunch (figures 29 and 30).

In 2007, the average mathematics score for AI/AN students eligible for free school lunch at grade 4 was higher than that of their Black peers and lower than that of their Hispanic peers. At eighth-grade, AI/AN students eligible for free school lunch scored lower than their Hispanic peers and not significantly different from their Black peers.

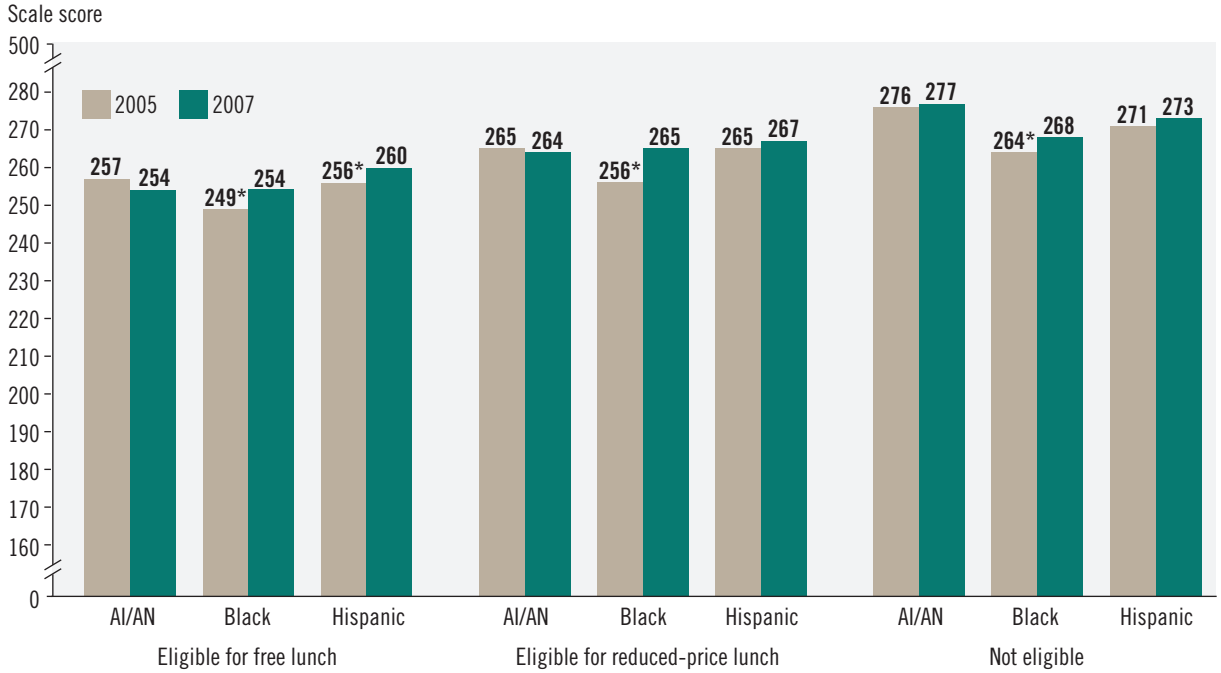
At both grades, AI/AN students who were not eligible for free or reduced-price school lunch scored higher than their Black and Hispanic counterparts.

Figure 29. **Average scores in NAEP mathematics at grade 4, by eligibility for National School Lunch Program and selected race/ethnicity categories: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

Figure 30. **Average scores in NAEP mathematics at grade 8, by eligibility for National School Lunch Program and selected race/ethnicity categories: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

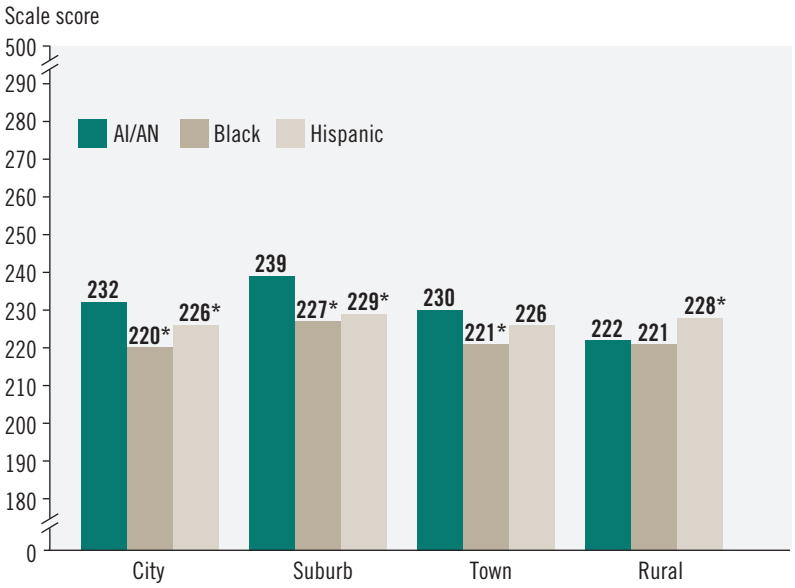
AI/AN students in city schools score higher than Black and Hispanic peers

The mathematics performance of AI/AN students and their Black and Hispanic peers varied depending on the location of the students' schools. In city and suburban schools, AI/AN fourth-graders had higher average scores than Black and Hispanic students in similar schools. In schools in town locations, AI/AN fourth-graders scored higher than their Black peers. AI/AN fourth-graders attending schools in rural locations had lower scores than their Hispanic peers (figure 31).

In city schools at grade 8, AI/AN students had higher scores than their Black and Hispanic counterparts in similar schools. AI/AN eighth-graders attending schools in rural locations had lower scores than their Hispanic peers (figure 32).

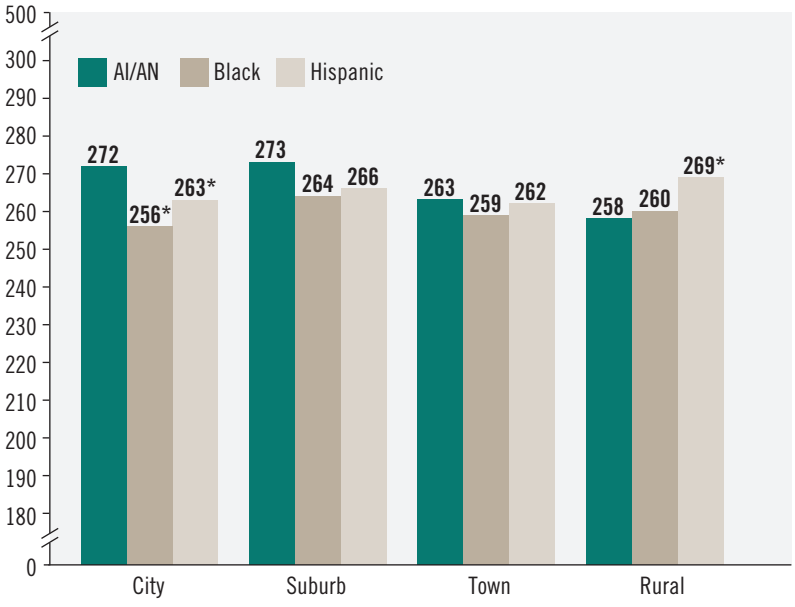
AI/AN fourth-graders attending schools in rural locations scored lower than AI/AN students in all other types of locations, and AI/AN students attending schools in suburban locations scored higher than their AI/AN counterparts in all other types of locations. At the eighth grade, AI/AN students attending schools in city locations scored higher than those in town and rural locations. See Technical Notes for more information on school locations (see also table A-4).

Figure 31. **Average scores in NAEP mathematics at grade 4, by type of school location and selected race/ethnicity categories: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 32. **Average scores in NAEP mathematics at grade 8, by type of school location and selected race/ethnicity categories: 2007**



* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

AI/AN fourth-graders in low density schools gain

School density refers to the percentage of AI/AN students enrolled in the school. Although not shown, 44 percent of AI/AN fourth-graders and 43 percent of AI/AN eighth-graders assessed in NAEP mathematics attended high density schools (those with at least a 25 percent AI/AN population).

High density schools were concentrated in rural locations (table 17). Compared to AI/AN students in low density schools, higher percentages of AI/AN students in high density schools were identified as eligible for free/reduced-priced school lunch and as English language learners.

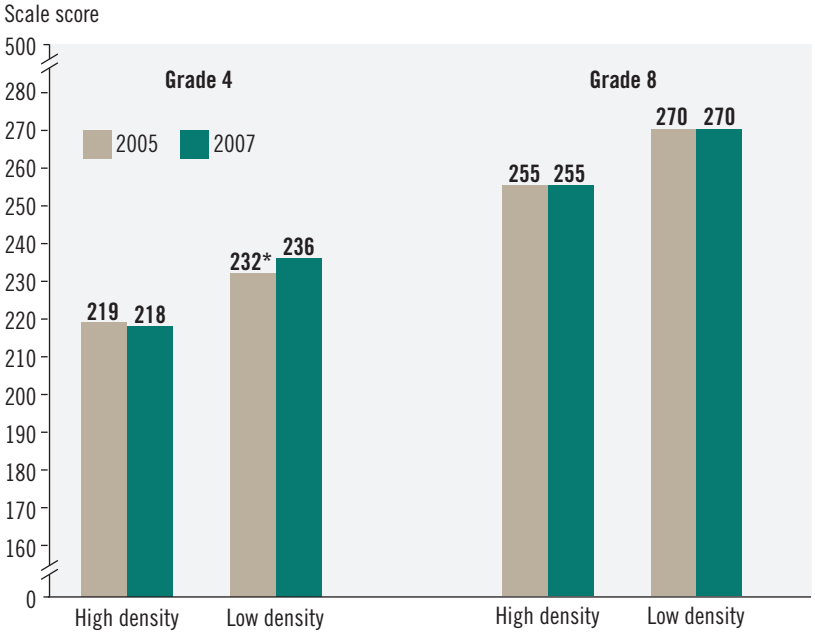
When looking at school density, the only significant change between 2005 and 2007 for AI/AN students in either grade was an increase in scores for fourth-graders in low density schools (figure 33). At both grades, AI/AN students at low density schools had higher average scores than their counterparts enrolled at high density schools in 2007.

Table 17. **Percentage of AI/AN students in NAEP mathematics, by grade, school density, and selected school and student characteristics: 2007**

School/student characteristics	Grade 4		Grade 8	
	High density	Low density	High density	Low density
School location				
City	2*	31	2*	29
Suburb	1*	24	1*	23
Town	23	19	20	21
Rural	74*	26	77*	26
Eligible for free/reduced-price lunch	81*	54	80*	47
Students with disabilities	12*	15	11	13
English language learners	17*	3	16*	2

* Significantly different ($p < .05$) from AI/AN students attending low density schools.
NOTE: AI/AN = American Indian/Alaska Native. School density indicates the proportion of AI/AN students enrolled. High density schools have 25 percent or more AI/AN students. Low density schools have less than 25 percent. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 33. **Average scores in NAEP mathematics for AI/AN students, by grade and school density: 2005 and 2007**



* Significantly different ($p < .05$) from 2007.
NOTE: AI/AN = American Indian/Alaska Native. School density indicates the proportion of AI/AN students enrolled. High density schools have 25 percent or more AI/AN students. Low density schools have less than 25 percent.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 and 2007 National Indian Education Studies.

AI/AN students in public schools score higher than their peers in BIE schools

Tables 18-A and 18-B show a brief profile of AI/AN fourth- and eighth-graders who attended public and BIE schools and were assessed in NAEP mathematics. While 87 to 89 percent of AI/AN students attended public schools, 6 to 7 percent of AI/AN students attended BIE schools. Ninety-three percent of AI/AN students enrolled in BIE schools attended schools in rural locations, and ninety-four percent were eligible for free/reduced-price school lunch. AI/AN students who attended public schools had higher average mathematics scores than their AI/AN peers attending BIE schools at both grades.

Table 18-A. **Percentage of AI/AN students and average scores in NAEP mathematics, by grade and type of school: 2007**

	Grade 4		Grade 8	
Type of school	Percentage	Average score	Percentage	Average score
Public	89	229	87	265
BIE	7*	207*	6*	244*

* Significantly different ($p < .05$) from AI/AN students attending public schools.
NOTE: AI/AN = American Indian/Alaska Native. BIE = Bureau of Indian Education. The percentages do not sum to 100 because results are not shown for Department of Defense and private schools.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Table 18-B. **Percentage of AI/AN students and average scores in NAEP mathematics, by type of school, grade, and selected school and student characteristics: 2007**

	Public schools		BIE schools	
Grade and school/student characteristics	Percentage	Average score	Percentage	Average score
Grade 4				
School location				
City	19	232	#	‡
Suburb	14	239	4*	‡
Town	23	230	2*	‡
Rural	43	225	93*	207*
Eligible for free/reduced-price lunch	66	223	94*	207*
Students with disabilities	14	210	13	186*
English language learners	8	204	29*	197*
Grade 8				
School location				
City	18	270	#	‡
Suburb	14	274	3*	‡
Town	23	263	4*	‡
Rural	45	262	93*	244*
Eligible for free/reduced-price lunch	60	258	94*	243*
Students with disabilities	12	235	15	216*
English language learners	8	238	20*	230*

Rounds to zero.
‡ Reporting standards not met. Sample size was insufficient to permit a reliable estimate.
* Significantly different ($p < .05$) from AI/AN students attending public schools.
NOTE: AI/AN = American Indian/Alaska Native. BIE = Bureau of Indian Education. Results are not shown for Department of Defense and private schools. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

State Mathematics Results

Results for 11 states with relatively large populations of American Indian/Alaska Native (AI/AN) students are reported for NIES 2007. The AI/AN student enrollment in these states represents more than 50 percent of the AI/AN student enrollment in the nation. NIES state-level data include results from AI/AN students who attended public and BIE schools. The national AI/AN sample referenced as a point of comparison to these state results was also made up of public and BIE school students only.

In examining the results for the selected states, the variations in educational contexts, such as different school types, demographic factors, and socioeconomic factors, should be considered.

School and student characteristics vary by state

The following two tables show the percentage of AI/AN students within each of the selected states by a variety of school and demographic categories including different school types and socioeconomic factors that should be considered when interpreting the results. The data in these two tables provide a snapshot of the diverse settings represented by the selected states.

For example, at grades 4 and 8, in four of the states (Arizona, New Mexico, North Dakota, and South Dakota) at least 17 percent of AI/AN students attended BIE schools (table 19-A). In the other seven selected states, 6 percent or less of AI/AN students attended BIE schools.

Table 19-A. **Percentage of AI/AN students assessed in NAEP mathematics, by various school characteristics, grade, and selected states: 2007**

	Type of school		School location				School density	
Grade and state	Public	BIE	City	Suburb	Town	Rural	High	Low
Grade 4								
Nation	92	8	18	14	21	47	44	56
Alaska	100	#	23*	2*	15	59*	68*	32*
Arizona	75*	25*	23	4*	10	63*	68*	32*
Minnesota	97*	3*	15	21	18	46	31	69
Montana	100	#	14	1*	23	62	73*	27*
New Mexico	71*	29*	17	5*	19	59	69*	31*
North Carolina	100	#	7*	5*	17	71	64*	36*
North Dakota	80*	20*	14	6*	12	68*	74*	26*
Oklahoma	100	#	10*	8*	36*	46	58*	42*
Oregon	100	#	22	#	39*	39	15*	85*
South Dakota	72*	28*	13	1	8*	77*	81*	19*
Washington	94	6	20	32*	15	33*	25*	75*
Grade 8								
Nation	93	7	17	14	22	48	43	57
Alaska	100	#	20	2	14*	65*	60*	40*
Arizona	83*	17*	18	7	15	60	71*	29*
Minnesota	97*	3*	11	7	31	50	25*	75*
Montana	99*	1*	13	2*	23	63*	63*	37*
New Mexico	80*	20*	10*	4*	10*	76*	78*	22*
North Carolina	100	#	10	#	35	55	60*	40
North Dakota	72*	28*	10*	5*	14*	71*	70*	30*
Oklahoma	99*	1*	6*	11	32*	50	67*	33*
Oregon	100	#	26	9	42*	23*	13*	87*
South Dakota	63*	37*	13	#	9*	78*	78*	22*
Washington	95	5	21	43*	13*	24*	16*	84*

Rounds to zero.
* Significantly different ($p < .05$) from AI/AN students in the nation.
NOTE: AI/AN = American Indian/Alaska Native. BIE = Bureau of Indian Education. School density indicates the proportion of AI/AN students enrolled. High density schools have 25 percent or more AI/AN students. Low density schools have less than 25 percent. The percentages under the type of school category may not sum to 100 because results are not shown for Department of Defense and private schools. The percentages under the school location and school density categories may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

In most of the selected states at both grades, more than 50 percent of AI/AN students attended rural schools. In comparison to the national percentage, most of the selected states had higher percentages of AI/AN students at both grades attending high density schools.

The percentages of AI/AN students eligible for free school lunch ranged from 45 percent in grade 8 in Oregon to 91 percent in grade 4 in South Dakota (table 19-B). The percentages of grade 4 AI/AN students identified as English language learners ranged from 1 percent (Minnesota, Oklahoma, and Washington) to 38 percent (New Mexico). At grade 8, the percentages of AI/AN students identified as English language learners ranged from 2 percent (Washington) to 37 percent (Alaska).

Table 19-B. **Percentage of AI/AN students assessed in NAEP mathematics, by various student characteristics, grade, and selected states: 2007**

Grade and state	Eligibility for National School Lunch Program			Students with disabilities	English language learners
	Eligible for free lunch	Eligible for reduced-price lunch	Not eligible		
Grade 4					
Nation	60	8	32	14	9
Alaska	62	6	30	17	28*
Arizona	74*	10	15*	12	21*
Minnesota	62	#	38	16	1*
Montana	77*	8	15*	12	24*
New Mexico	88*	1*	12*	9*	38*
North Carolina	56	9	35	16	#
North Dakota	86*	2*	11*	19	7
Oklahoma	52*	11*	37*	12	1*
Oregon	55	12	32	20	6
South Dakota	91*	1*	8*	16	14*
Washington	52	3	45*	17	1*
Grade 8					
Nation	56	7	36	13	9
Alaska	60	4*	36	14	37*
Arizona	70*	6	23*	10	12
Minnesota	54	#	46	25	#
Montana	59	10	31	16	32*
New Mexico	83*	1*	16*	11	35*
North Carolina	60	11	29	21	#
North Dakota	82*	3*	15*	17	14
Oklahoma	52	10*	38	9	3*
Oregon	45	14	41	14	5
South Dakota	83*	2*	16*	14	6*
Washington	55	#	43	12	2*

Rounds to zero.
* Significantly different ($p < .05$) from AI/AN students in the nation.
NOTE: AI/AN = American Indian/Alaska Native. The percentages under the eligibility for National School Lunch Program category may not sum to 100 percent because results are not shown for students whose eligibility status was not available.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

AI/AN fourth-graders in Oklahoma and Minnesota score higher than AI/AN peers in the nation

At grade 4, AI/AN students in Oklahoma and Minnesota had higher average scores than their peers in the nation, while AI/AN students in 6 out of the 11 selected states had scores that were lower. Figure 34 shows the average mathematics scores for grade 4 AI/AN students from the selected states and the nation.

Figure 35 shows achievement-level results for the selected states. The percentages of AI/AN students performing at or above the *Basic* level ranged from 51 percent in Arizona to 80 percent in Oklahoma.

Figure 34. **Cross-state comparison of average scores in NAEP mathematics for AI/AN students at grade 4: 2007**

Jurisdiction (Average score)	Nation	Other 39 states[1]	Oklahoma	Minnesota	North Carolina	Washington	North Dakota	Montana	Oregon	Alaska	New Mexico	South Dakota	Arizona
Nation (228)		▼	▼	▼			▲	▲		▲	▲	▲	▲
Other 39 states[1] (235)	▲						▲	▲	▲	▲	▲	▲	▲
Oklahoma (234)	▲						▲	▲	▲	▲	▲	▲	▲
Minnesota (234)	▲						▲	▲	▲	▲	▲	▲	▲
North Carolina (229)										▲	▲	▲	▲
Washington (226)											▲	▲	▲
North Dakota (223)	▼	▼	▼	▼								▲	▲
Montana (222)	▼	▼	▼	▼								▲	▲
Oregon (220)		▼	▼	▼									
Alaska (218)	▼	▼	▼	▼	▼								
New Mexico (217)	▼	▼	▼	▼	▼	▼							
South Dakota (215)	▼	▼	▼	▼	▼	▼	▼	▼					
Arizona (213)	▼	▼	▼	▼	▼	▼	▼	▼					

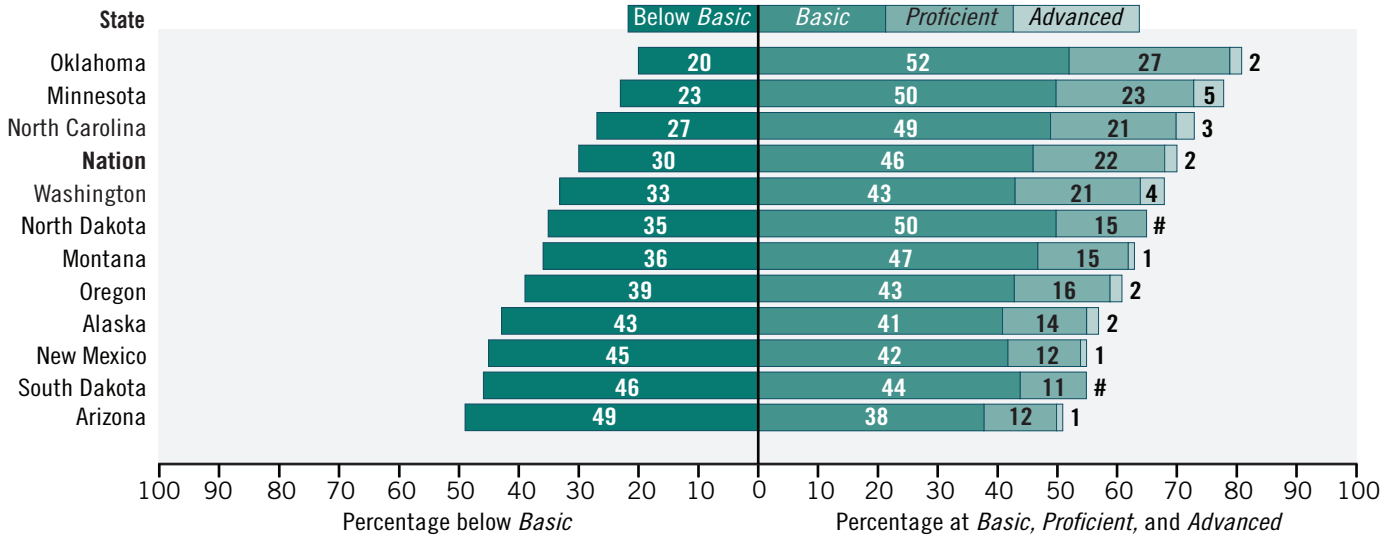
▲ The jurisdiction had a higher average score than the jurisdiction listed at the top of the column.

No statistically significant difference detected from the jurisdiction listed at the top of the column.

▼ The jurisdiction had a lower average score than the jurisdiction listed at the top of the column.

[1] The "other 39 states" category includes all states not shown and the District of Columbia.
NOTE: AI/AN = American Indian/Alaska Native. Read across the row corresponding to a jurisdiction listed to the left of the chart. Match the shading intensity (and arrow direction) to the chart's key to determine whether the average score for students in this jurisdiction was found to be higher than (up arrow), not significantly different from (blank cell), or lower than (down arrow) the average score for students in the jurisdiction in the column heading.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 35. **Percentage of AI/AN students in NAEP mathematics at grade 4, by achievement level and selected states: 2007**



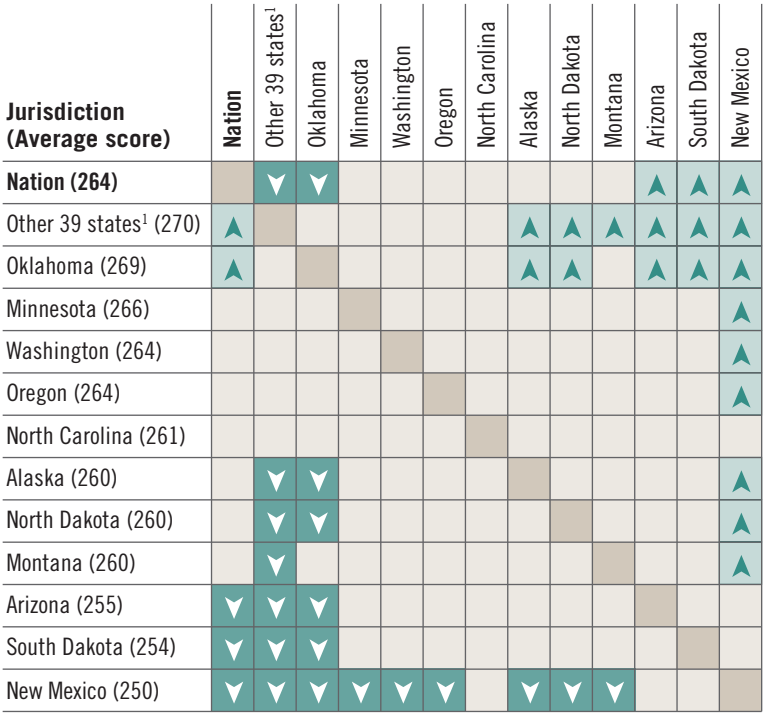
Rounds to zero.
NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

AI/AN eighth-graders in Oklahoma score higher than AI/AN peers in the nation

Compared to AI/AN grade 8 students in the nation, AI/AN students in Oklahoma had higher average scores, and their AI/AN peers in Arizona, South Dakota, and New Mexico had lower average scores (figure 36). The average scores of AI/AN eighth-graders in the other seven selected states were not significantly different from the scores of AI/AN students in the nation.

Figure 37 shows achievement-level results for the selected states. The percentages of AI/AN students performing at or above the *Basic* level ranged from 37 percent in New Mexico to 60 percent in Oklahoma.

Figure 36. **Cross-state comparison of average scores in NAEP mathematics for AI/AN students at grade 8: 2007**



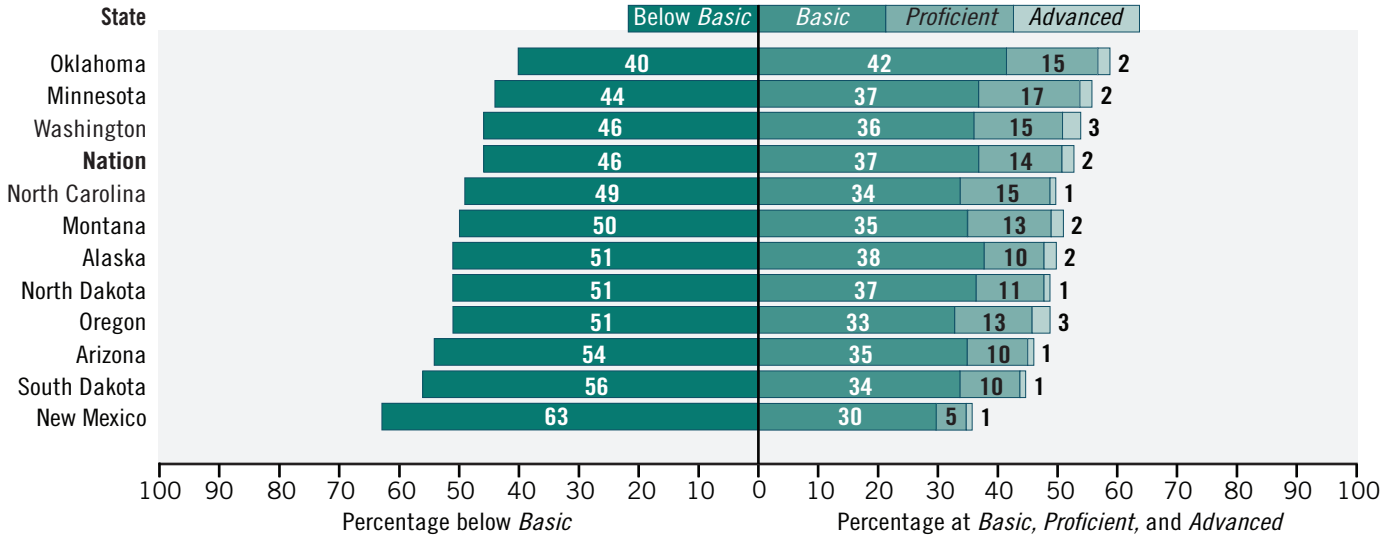
The jurisdiction had a higher average score than the jurisdiction listed at the top of the column.

No statistically significant difference detected from the jurisdiction listed at the top of the column.

The jurisdiction had a lower average score than the jurisdiction listed at the top of the column.

[1] The "other 39 states" category includes all states not shown and the District of Columbia.
NOTE: AI/AN = American Indian/Alaska Native. Read across the row corresponding to a jurisdiction listed to the left of the chart. Match the shading intensity (and arrow direction) to the chart's key to determine whether the average score for students in this jurisdiction was found to be higher than (up arrow), not significantly different from (blank cell), or lower than (down arrow) the average score for students in the jurisdiction in the column heading.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 37. **Percentage of AI/AN students in NAEP mathematics at grade 8, by achievement level and selected states: 2007**



NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Regional Mathematics Results

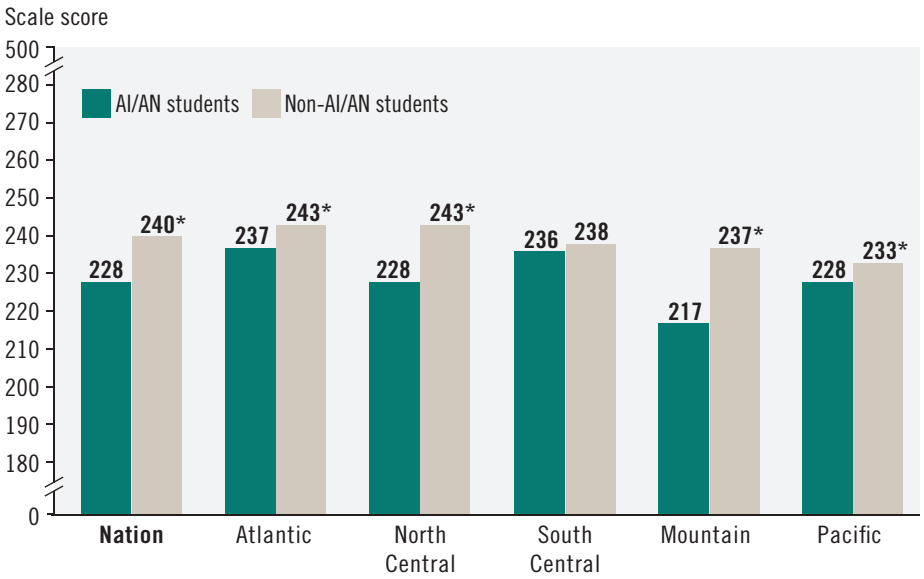
Mathematics results are also reported for the five NIES-defined regions: Atlantic, North Central, South Central, Mountain, and Pacific. These regions, which differ from the typical regions used in other NAEP reports, are based on U.S. Census divisions and are configured to align with the overall distribution of the American Indian/Alaska Native student population. The regional results are based on samples from students enrolled in all types of schools (public, private, BIE, and Department of Defense) and reflect the combined samples from all of the states within each region.

AI/AN results vary across regions

At grade 4, AI/AN students scored lower on average than non-AI/AN students in each of the regions except for South Central (figure 38). The score difference between non-AI/AN and AI/AN students was 12 points at the national level. The score differences in the regions ranged from 2 points (not statistically significant) in the South Central region to 20 points in the Mountain region.

Approximately 74 percent of the grade 4 AI/AN students assessed in mathematics attended schools in the South Central, Mountain, and Pacific regions combined (table 20).

Figure 38. **Average scores in NAEP mathematics at grade 4, by region and student group: 2007**



* Significantly different ($p < .05$) from AI/AN students in the same region.
NOTE: AI/AN = American Indian/Alaska Native.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Table 20. **Percentage of AI/AN and non-AI/AN students assessed in NAEP mathematics at grade 4, by region: 2007**

Region	AI/AN students	Non-AI/AN students
Atlantic	9	36*
North Central	17	22*
South Central	28	19*
Mountain	28	7*
Pacific	18	17

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

With the exception of the Atlantic region (in which there was no significant difference in average scores), AI/AN eighth-graders in each of the regions had lower average scores than non-AI/AN students (figure 39). At the national level, the score difference between non-AI/AN and AI/AN eighth-graders was 18 points. The difference in average scores within the regions ranged from 7 points (not statistically significant) in the Atlantic region to 26 points in the Mountain region.

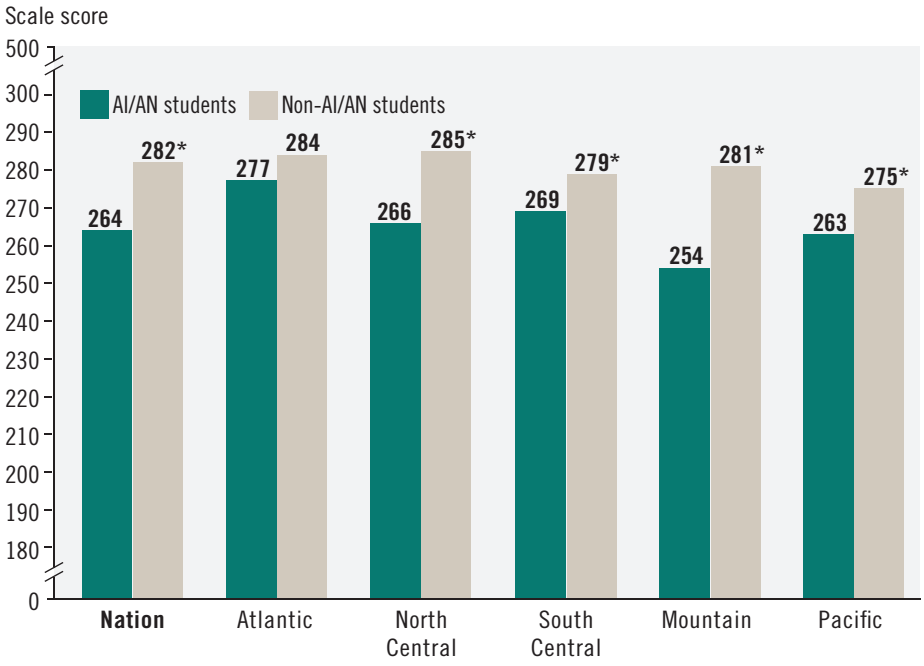
Approximately 74 percent of the grade 8 AI/AN students assessed in mathematics attended schools in the South Central, Mountain, and Pacific regions combined (table 21).

Table 21. **Percentage of AI/AN and non-AI/AN students assessed in NAEP mathematics at grade 8, by region: 2007**

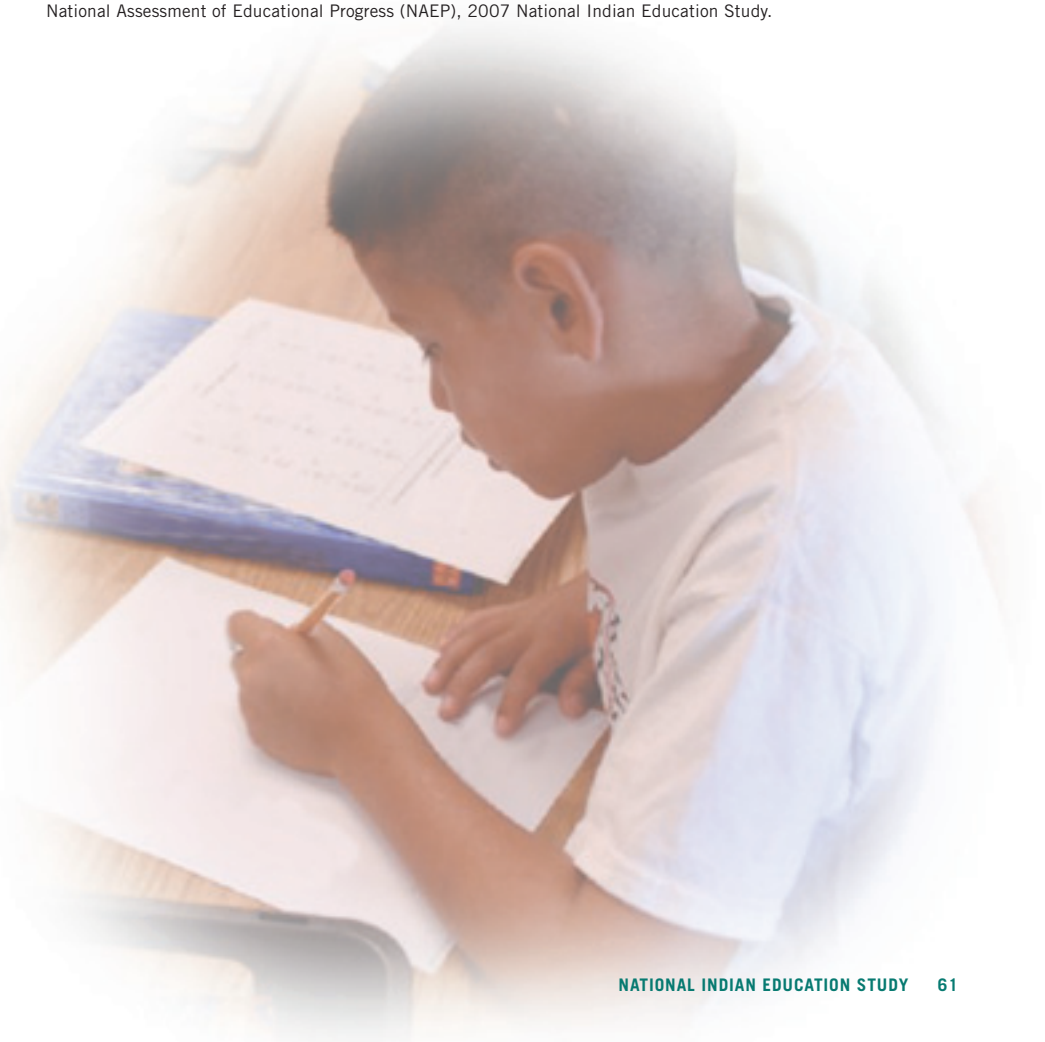
Region	AI/AN students	Non-AI/AN students
Atlantic	10	37*
North Central	16	22*
South Central	23	17*
Mountain	31	7*
Pacific	20	17

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Figure 39. **Average scores in NAEP mathematics at grade 8, by region and student group: 2007**



* Significantly different ($p < .05$) from AI/AN students in the same region.
NOTE: AI/AN = American Indian/Alaska Native.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.



Assessment Content at Grade 4

To interpret the results in meaningful ways, it is important to understand the content of the assessment. Content was varied to reflect differences in the skills students were expected to have at each grade. The proportion of the assessment devoted to each of the mathematics content areas in each grade can be found in table 13.

Of the 166 questions that made up the fourth-grade mathematics assessment, the largest percentage (40 percent) focused on number properties and operations. It was expected that fourth-graders should have a solid grasp of whole numbers and a beginning understanding of fractions.

In measurement, the emphasis was on length, including perimeter, distance, and height. Students were expected to demonstrate knowledge of common customary and metric units. In geometry, students were expected to be familiar with simple figures in two and three dimensions and their attributes. In data analysis and probability, students were expected to demonstrate understanding of how data are collected and organized and basic concepts of probability. In algebra at this grade, the emphasis was on recognizing, describing, and extending patterns and rules.

MATHEMATICS ACHIEVEMENT LEVELS AT GRADE 4

The following descriptions are abbreviated versions of the full achievement-level descriptions for grade 4 mathematics. The cut score depicting the lowest score representative of that level is noted in parentheses. The full descriptions can be found at http://www.nagb.org/frameworks/math_07.pdf.

Basic (214): Fourth-graders performing at the *Basic* level should be able to estimate and use basic facts to perform simple computations with whole numbers; show some understanding of fractions and decimals; and solve some simple real-world problems in all NAEP content areas. Students at this level should be able to use—though not always accurately—four-function calculators, rulers, and geometric shapes. Their written responses are often minimal and presented without supporting information.

Proficient (249): Fourth-graders performing at the *Proficient* level should be able to use whole numbers to estimate, compute, and determine whether results are reasonable. They should have a conceptual understanding of fractions and decimals; be able to solve real-world problems in all NAEP content areas; and use four-function calculators, rulers, and geometric shapes appropriately. Students performing at the *Proficient* level should employ problem-solving strategies such as identifying and using appropriate information. Their written solutions should be organized and presented both with supporting information and explanations of how they were achieved.

Advanced (282): Fourth-graders performing at the *Advanced* level should be able to solve complex nonroutine real-world problems in all NAEP content areas. They should display mastery in the use of four-function calculators, rulers, and geometric shapes. These students are expected to draw logical conclusions and justify answers and solution processes by explaining why, as well as how, they were achieved. They should go beyond the obvious in their interpretations and be able to communicate their thoughts clearly and concisely.

What Fourth-Graders Know and Can Do in Mathematics

The item map below is useful for understanding performance at different levels on the scale. The scale scores on the left represent the average scores for students who were likely to get the items correct. The lower-boundary scores at each achievement level are noted in boxes. The descriptions of selected assessment questions are listed on the right along with the corresponding mathematics content areas.

For example, the map shows that fourth-graders performing in the middle of the *Basic* range (students with an average score of 225) were likely to be able to identify a fraction modeled by a picture. Students performing in the middle of the *Proficient* range (with an average score of 267) were likely to be able to explain how to find the perimeter of a given shape.

GRADE 4 NAEP MATHEMATICS ITEM MAP

	Scale score	Content area	Question description
	500		
Advanced	330	**Data analysis and probability**	Label sections in a spinner to satisfy a given condition
	318	**Number properties and operations**	*Add three fractions with like denominators*
	296	**Algebra**	*Relate input to output from a table of values*
	294	**Number properties and operations**	*Solve a story problem involving addition and subtraction* (shown on page 64)
	290	**Measurement**	*Find area of a square with inscribed triangle* (shown on page 65)
	289	**Geometry**	*Recognize the result of folding a given shape*
	287	**Data analysis and probability**	Identify color with highest chance of being chosen (shown on page 67)
	282		
Proficient	279	**Number properties and operations**	Solve a story problem requiring multiple operations
	279	**Data analysis and probability**	*Identify picture representing greatest probability*
	267	**Measurement**	Explain how to find the perimeter of a given shape
	264	**Number properties and operations**	*Solve a story problem involving money*
	263	**Algebra**	*Identify number that would be in a pattern*
	262	**Geometry**	*Determine the number of blocks used to build a figure*
	255	**Number properties and operations**	*Use place value to determine the amount of increase*
	250	**Geometry**	*Identify the 3-D shape resulting from folding paper*
	249	**Data analysis and probability**	*Determine probability of a specific outcome*
	249		
Basic	245	**Number properties and operations**	Recognize property of odd numbers
	243	**Number properties and operations**	Multiply two decimal numbers
	232	**Measurement**	*Determine attribute being measured from a picture*
	230	**Number properties and operations**	*Subtract a three-digit number from a four-digit number*
	227	**Algebra**	*Identify number sentence that models a balanced scale* (shown on page 68)
	225	**Number properties and operations**	*Identify a fraction modeled by a picture*
	220	**Algebra**	*Identify an expression that represents a scenario*
	218	**Number properties and operations**	*Find a sum based on place value*
	217	**Geometry**	*Identify congruent triangles*
	214		
	211	**Data analysis and probability**	Complete a bar graph
	205	**Geometry**	*Use reason to identify figure based on description* (shown on page 66)
	202	**Measurement**	*Identify appropriate unit for measuring length*
	202	**Number properties and operations**	*Identify place value representation of a number*
	191	**Algebra**	*Find unknown in whole number sentence*
	0		

NOTE: Regular type denotes a constructed-response question. *Italic* type denotes a multiple-choice question. The position of a question on the scale represents the average scale score attained by students who had a 65 percent probability of successfully answering a constructed-response question, or a 74 percent probability of correctly answering a four-option multiple-choice question. For constructed-response questions, the question description represents students' performance rated as completely correct. Scale score ranges for mathematics achievement levels are referenced on the map.

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

Sample Multiple-Choice Question—Number Properties and Operations

This sample question measures fourth-graders' performance in the number properties and operations content area. In particular, it addresses the "Number operations" subtopic, which focuses on computation, the effects of operations on numbers, and the relationships between operations. The framework objective measured is "Solve application problems involving numbers and operations." Students were not permitted to use a calculator to solve this problem.

Thirty-one percent of AI/AN fourth-graders selected the correct answer (choice B). One way to arrive at this answer is first to use subtraction to determine that the bridge was built in 1926, and then use addition to determine that it was 50 years old in 1976. The most common incorrect choice (choice A), which was selected by 39 percent of fourth-graders, can be obtained by subtracting 50 years from 2001. The other incorrect answer choices (C and D) represent computation errors.

The Ben Franklin Bridge was 75 years old in 2001. In what year was the bridge 50 years old?

- (A) 1951
- (B) 1976
- (C) 1984
- (D) 1986

Percentage of fourth-grade students in each response category in 2007

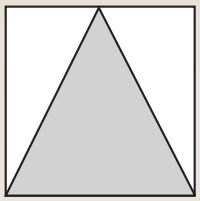
Student group	Choice A	Choice B	Choice C	Choice D	Omitted
Nation (all students)	39	**36**	10	14	1
AI/AN students	39	**31**	11	17	3

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.

Sample Multiple-Choice Question—Measurement

This sample question measures fourth-graders' performance in the measurement content area. This question addresses the "Measuring physical attributes" subtopic, which focuses on identifying attributes that can be measured, comparing objects or estimating the size of an object, using measurement instruments, and solving problems involving perimeter and area of simple plane figures. The framework objective measured by this question is "Compare objects with respect to a given attribute, such as length, area, volume, time, or temperature." A calculator was not available for this question.

Forty-three percent of AI/AN fourth-graders selected the correct answer (choice C). To answer this question, the student could reason that the area of the triangle, which is equal to "½ × base × height," is also equal to "½ × base of the square × height of the square," or equivalent to ½ times the area of the square. Since the area of the triangle is equal to 4, the area of the square is equal to twice the area of the triangle, which is 2 × 4 = 8 square inches. Incorrect answer choices are 4 (choice B), which is the area of the triangle, one-half of 4 (choice A), and 4^2 (choice D).



If the area of the shaded triangle is 4 square inches, what is the area of the entire square?

- (A) 2 square inches
- (B) 4 square inches
- (C) 8 square inches
- (D) 16 square inches

Percentage of fourth-grade students in each response category in 2007

Student group	Choice A	Choice B	Choice C	Choice D	Omitted
Nation (all students)	12	17	**48**	22	1
AI/AN students	15	22	**43**	19	1

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.

Sample Multiple-Choice Question—Geometry

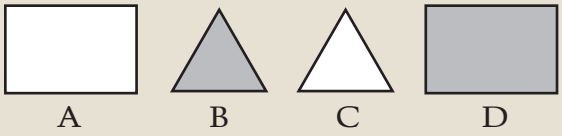
This sample question measures fourth-graders' performance in the geometry content area. This question addresses the "Mathematical reasoning" subtopic, which focuses on reasoning about geometric figures and their properties. The framework objective measured by this question is "Distinguish which objects in a collection satisfy a given geometric definition and explain choices." A calculator was not available for this question.

Eighty-seven percent of AI/AN fourth-graders selected the correct answer (choice D), the shaded rectangle.

Percentage of fourth-grade students in each response category in 2007

Student group	Choice A	Choice B	Choice C	Choice D	Omitted
Nation (all students)	5	3	1	**90**	1
AI/AN students	6	3	3	**87**	1

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.



Melissa chose one of the figures above.

- **The figure she chose was shaded.**
- **The figure she chose was <u>not</u> a triangle.**

Which figure did she choose?

Ⓐ **A**

Ⓑ **B**

Ⓒ **C**

Ⓓ **D**

Sample Constructed-Response Question—Data Analysis and Probability

This sample question measures fourth-graders' performance in the data analysis and probability content area. It addresses the "Probability" subtopic, which focuses on simple probability and counting or representing the outcomes of a given event. The framework objective measured by this question is "Use informal probabilistic thinking to describe chance events." A calculator was not available for this question.

Student responses for this question were rated using the following three-level scoring guide:

Correct—Response indicates that a red cube is most likely to be picked and indicates that the probability is 3 out of 6 (or equivalent).

Partial—Response indicates that a red cube is most likely to be picked or indicates that the probability is 3 out of 6 (or equivalent).

Incorrect—All incorrect responses.

The student response on the right was rated as "Correct" because both parts of the question were answered correctly. Eleven percent of AI/AN fourth-graders gave a response that was rated "Correct" for this question. Seventy percent of AI/AN fourth-graders provided a response rated as "Partial."

Percentage of fourth-grade students in each response category in 2007

Student group	Correct	Partial	Incorrect	Omitted
Nation (all students)	22	67	10	1
AI/AN students	11	70	18	1

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because a small percentage of responses that did not address the assessment task are not shown.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.

There are 6 cubes of the same size in a jar.

2 cubes are yellow.

3 cubes are red.

1 cube is blue.

Chuck is going to pick one cube without looking. Which color is he most likely to pick?

red

What is the probability of this color being picked?

3 out of 6

Sample Multiple-Choice Question—Algebra

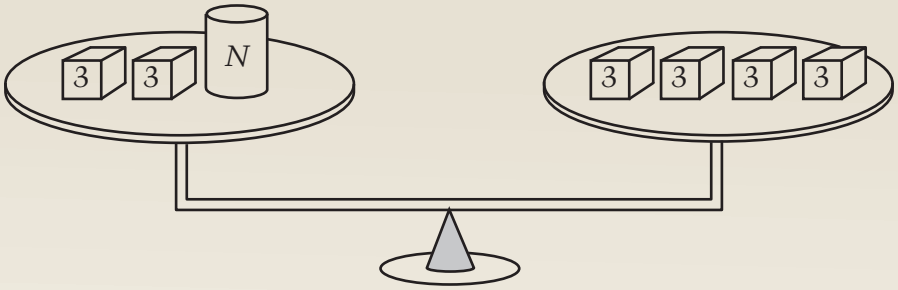
This sample question measures fourth-graders' performance in the algebra content area. This question addresses the "Variables, expressions, and operations" subtopic, which focuses on representing unknown quantities and expressing simple mathematical relationships with symbols. The framework objective measured by this question is "Express simple mathematical relationships using number sentences." A calculator was available for this question.

Seventy-two percent of AI/AN fourth-graders selected the correct answer (choice A). Answering this question correctly requires recognizing that each block on the scale represents the quantity "three," and the cylinder represents a specific, but unknown, quantity. The incorrect answer choices are obtained by using the number of blocks instead of the weight of the blocks on the right side of the scale (choice B), the left side of the scale (choice C), or both (choice D).

Percentage of fourth-grade students in each response category in 2007

Student group	Choice A	Choice B	Choice C	Choice D	Omitted
Nation (all students)	**79**	5	9	5	2
AI/AN students	**72**	9	9	8	2

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.



The weights on the scale above are balanced. Each cube weighs 3 pounds. The cylinder weighs *N* pounds. Which number sentence best describes this situation?

(A) $6 + N = 12$

(B) $6 + N = 4$

(C) $2 + N = 12$

(D) $2 + N = 4$

Assessment Content at Grade 8

Of the 168 questions that made up the eighth-grade mathematics assessment, the largest percentage (approximately 30 percent) focused on algebra. The emphasis was on students' understanding of algebraic representations, patterns, and functions; linearity; and algebraic expressions, equations, and inequalities. The knowledge and skills expected at grade 8 in number properties and operations include computing with rational numbers, common irrational numbers, and numbers in scientific notation, and using numbers to solve problems involving proportionality and rates. In the measurement content area, students were expected to be familiar with area, volume, angles, and rates. In geometry, eighth-graders were expected to be familiar with parallel and perpendicular lines, angle relations in polygons, cross sections of solids, and the Pythagorean theorem. In data analysis and probability, students were expected to use a variety of techniques for organizing and summarizing data, analyzing statistical claims, and demonstrating an understanding of the terminology and concepts of probability.

MATHEMATICS ACHIEVEMENT LEVELS AT GRADE 8

The following descriptions are abbreviated versions of the full achievement-level descriptions for grade 8 mathematics. The cut score depicting the lowest score representative of that level is noted in parentheses. The full descriptions can be found at http://www.nagb.org/frameworks/math_07.pdf.

Basic (262): Eighth-graders performing at the *Basic* level should complete problems correctly with the help of structural prompts such as diagrams, charts, and graphs. They should be able to solve problems in all NAEP content areas through the appropriate selection and use of strategies and technological tools, including calculators, computers, and geometric shapes. Students at this level also should be able to use fundamental algebraic and informal geometric concepts in problem solving. As they approach the *Proficient* level, students at the *Basic* level should be able to determine which of the available data are necessary and sufficient for correct solutions and use them in problem solving. However, these eighth-graders show limited skill in communicating mathematically.

Proficient (299): Eighth-graders performing at the *Proficient* level should be able to conjecture, defend their ideas, and give supporting examples. They should understand the connections among fractions, percents, decimals, and other mathematical topics such as algebra and functions. Students at this level are expected to have a thorough understanding of *Basic* level arithmetic operations—an understanding sufficient for problem solving in practical situations. Quantity and spatial relationships in problem solving and reasoning should be familiar to them, and they should be able to convey underlying reasoning skills beyond the level of arithmetic. They should be able to compare and contrast mathematical ideas and generate their own examples. These students should make inferences from data and graphs, apply properties of informal geometry, and accurately use the tools of technology. Students at this level should understand the process of gathering and organizing data and be able to calculate, evaluate, and communicate results within the domain of statistics and probability.

Advanced (333): Eighth-graders performing at the *Advanced* level should be able to probe examples and counterexamples in order to shape generalizations from which they can develop models. Eighth-graders performing at the *Advanced* level should use number sense and geometric awareness to consider the reasonableness of an answer. They are expected to use abstract thinking to create unique problem-solving techniques and explain the reasoning processes underlying their conclusions.

What Eighth-Graders Know and Can Do in Mathematics

The item map below illustrates the range of mathematical knowledge and skills demonstrated by eighth-graders. For example, students performing near the middle of the *Basic* range (with an average score of 278) were likely to be able to estimate time given a rate and a distance. Students performing near the top of the *Proficient* range (with an average score of 325) were likely to be able to complete a table and write an algebraic expression.

GRADE 8 NAEP MATHEMATICS ITEM MAP

	Scale score	Content area	Question description
	500		
	~		
Advanced	364	**Geometry**	Model a geometrical situation given specific conditions
	355	**Measurement**	*Estimate side length of a square given area*
	342	**Algebra**	*Identify the graph of a linear equation*
	340	**Number properties and operations**	*Interpret a number expressed in scientific notation*
	337	**Geometry**	Find container height given dimensions of contents (shown on page 73)
	334	**Data analysis and probability**	Identify best method for selecting a sample
	333		
Proficient	329	**Algebra**	*Convert a temperature from Fahrenheit to Celsius*
	328	**Data analysis and probability**	*Identify which statistic is represented by a response*
	325	**Algebra**	Complete a table and write an algebraic expression
	320	**Number properties and operations**	*Determine distance given rate and time*
	317	**Number properties and operations**	Analyze a mathematical relationship (shown on page 71)
	314	**Algebra**	*Use a formula to solve a problem*
	311	**Number properties and operations**	*Divide large numbers in a given context*
	308	**Measurement**	Determine value of marks on a scale
	306	**Geometry**	*Determine measure of an angle in a figure*
	304	**Number properties and operations**	*Identify fractions listed in ascending order*
	301	**Algebra**	*Determine an equation relating sales and profit* (shown on page 75)
	299		
Basic	296	**Data analysis and probability**	*Identify relationship in a scatterplot* (shown on page 74)
	296	**Number properties and operations**	*Convert raw points to a percentage*
	287	**Data analysis and probability**	Explain which survey is better
	278	**Number properties and operations**	*Estimate time given a rate and a distance*
	276	**Algebra**	*Determine an expression to model a scenario*
	268	**Measurement**	*Determine width after proportional enlargement*
	265	**Algebra**	*Identify point on a graph with specified coordinates*
	262		
	261	**Algebra**	*Evaluate an expression for a specific value*
	259	**Data analysis and probability**	*Recognize misrepresented data*
	258	**Measurement**	*Determine dimensions that give the greatest volume* (shown on page 72)
	258	**Geometry**	*Identify the result of combining two shapes*
	257	**Algebra**	*Solve an algebraic equation*
	254	**Number properties and operations**	*Use place value to write a number*
	~		
	0		

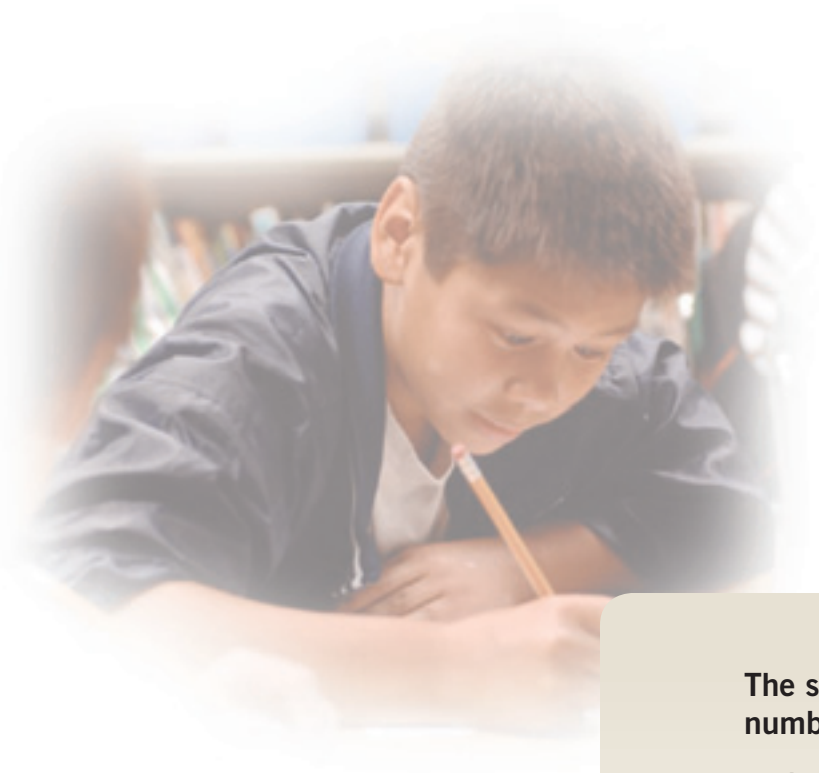
NOTE: Regular type denotes a constructed-response question. *Italic* type denotes a multiple-choice question. The position of a question on the scale represents the average scale score attained by students who had a 65 percent probability of successfully answering a constructed-response question, a 74 percent probability of correctly answering a four-option multiple-choice question, or a 72 percent probability of correctly answering a five-option multiple-choice question. For constructed-response questions, the question description represents students' performance rated as completely correct. Scale score ranges for mathematics achievement levels are referenced on the map.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.

Sample Constructed-Response Question—Number Properties and Operations

This sample question measures eighth-graders' performance in the number properties and operations content area. It addresses the "Properties of number and operations" subtopic, which focuses on recognizing, describing, and explaining properties of integers and operations. The framework objective measured by this question is "Explain or justify a mathematical concept or relationship." A calculator was available for this question.

Student responses for this question were rated using a two-level scoring guide, rating responses as "Correct" or "Incorrect."

Twenty-nine percent of grade 8 AI/AN students correctly responded to this question. The student response below was rated as "Correct." It showed that if two of the three numbers are 23 and 62, then the third number must be 88, and therefore, 62 cannot be the largest of the three numbers.



Percentage of eighth-grade students in each response category in 2007

Student group	Correct	Incorrect	Omitted
Nation (all students)	**42**	55	2
AI/AN students	**29**	69	2

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because a small percentage of responses that did not address the assessment task are not shown.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.

The sum of three numbers is 173. If the smallest number is 23, could the largest number be 62?

○ Yes ● No

Explain your answer in the space below.

62 + 23 = 85 and 173 - 85 = 88. 88 would have to be the third number and 88 is larger than 62.

Sample Multiple-Choice Question—Measurement

This sample question measures eighth-graders' performance in the measurement content area. It addresses the "Measuring physical attributes" subtopic, which focuses on comparing objects or estimating the size of an object with respect to a measurement attribute (such as length), using appropriate measurement instruments, solving problems involving the perimeter or area of plane figures, and solving problems involving the volume or surface area of solids. The framework objective measured by this question is "Compare objects with respect to length, area, volume, angle measurement, weight, or mass." A calculator was not available for this question.

Sixty-seven percent of AI/AN eighth-graders selected the correct answer (choice A). By comparing the refrigerator dimensions, it is possible to identify the refrigerator with the largest capacity without computing the volumes. For example, the refrigerator in choice A has one dimension that is equal to a dimension of the refrigerators in choices B and C, and two dimensions that are both greater than the other two dimensions in these refrigerators. Therefore, choices B and C do not have the largest capacity. Similarly, the refrigerator in choice A has a larger capacity than either of the refrigerators in choices D and E.

Mr. Elkins plans to buy a refrigerator. He can choose from five different refrigerators whose interior dimensions, in inches, are given below. Which refrigerator has the greatest capacity (volume)?

- (A) $42 \times 34 \times 30$
- (B) $42 \times 30 \times 32$
- (C) $42 \times 28 \times 32$
- (D) $40 \times 34 \times 30$
- (E) $40 \times 30 \times 28$

Percentage of eighth-grade students in each response category in 2007

Student group	Choice A	Choice B	Choice C	Choice D	Choice E	Omitted
Nation (all students)	**76**	9	6	6	2	1
AI/AN students	**67**	15	7	7	3	1

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.

Sample Constructed-Response Question—Geometry

This sample question measures eighth-graders' performance in the geometry content area. It addresses the "Relationships between geometric figures" subtopic, which focuses on applying geometric properties, solving problems, representing and analyzing situations in two and three dimensions, and solving problems using the Pythagorean theorem. The framework objective measured by this question is "Represent problem situations with simple geometric models to solve mathematical or real-world problems." A calculator was available for this question.

Student responses for this question were rated using the following three-level scoring guide:

Correct—Response indicates that the minimum height of the can is 18 centimeters and gives a correct diagram or a complete explanation.

Partial—Response indicates that the minimum height of the can is 18 centimeters without supporting work, or the response gives a correct diagram or explanation without indicating that the height is 18, or the response gives an incorrect height with work supporting the height that is given.

Incorrect—All incorrect responses.

Nine percent of grade 8 AI/AN students correctly responded to this question. The first response below was rated as "Correct," explaining that since the radius of each ball is 3 centimeters, the diameter of each ball is 6 centimeters, and therefore the height is $6 \times 3 = 18$ centimeters. The second response shows a common response that was rated "Partial," giving a correct diagram supporting an incorrect answer of 9 centimeters. This answer was obtained by computing the minimum height of a can holding three balls each with a diameter of 3 centimeters (instead of a radius of 3 centimeters).

Percentage of eighth-grade students in each response category in 2007

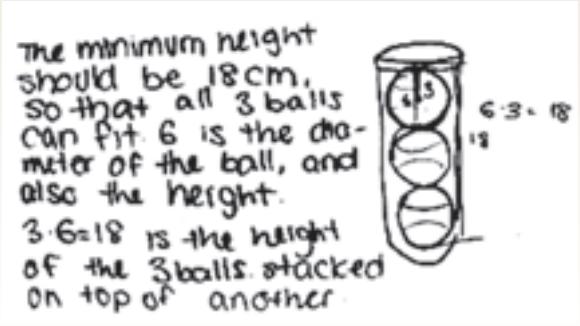
Student group	Correct	Partial	Incorrect	Omitted
Nation (all students)	**18**	20	48	13
AI/AN students	**9**	16	59	13

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because a small percentage of responses that did not address the assessment task are not shown.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.

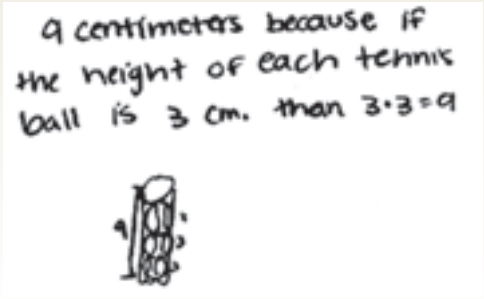
Three tennis balls are to be stacked one on top of another in a cylindrical can. The radius of each tennis ball is 3 centimeters. To the nearest whole centimeter, what should be the minimum height of the can?

Explain why you chose the height that you did. Your explanation should include a diagram.

Student Response—Correct



Student Response—Partial



Sample Multiple-Choice Question—Data Analysis and Probability

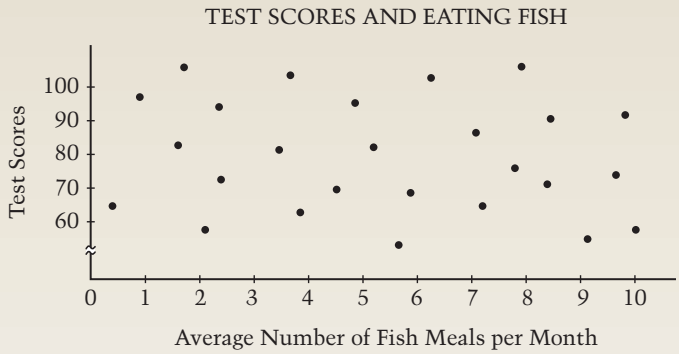
This sample question measures eighth-graders' performance in the data analysis and probability content area. It addresses the "Data representation" subtopic, which focuses on reading and interpreting data, solving problems by estimating and computing with data, and comparing different representations of data. The framework objective measured by this question is "Read or interpret data, including interpolating or extrapolating from data." A calculator was available for this question.

Fifty-three percent of eighth-grade AI/AN students selected the correct answer for this question (choice A). The incorrect answer choices for this question represent various misinterpretations of the relationship between test scores and the average number of fish meals per month.

Percentage of eighth-grade students in each response category in 2007

Student group	Choice A	Choice B	Choice C	Choice D	Choice E	Omitted
Nation (all students)	**62**	11	9	12	5	1
AI/AN students	**53**	18	11	12	5	1

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.



For a science project, Marsha made the scatterplot above that gives the test scores for the students in her math class and the corresponding average number of fish meals per month. According to the scatterplot, what is the relationship between test scores and the average number of fish meals per month?

- (A) **There appears to be no relationship.**
- (B) **Students who eat fish more often score higher on tests.**
- (C) **Students who eat fish more often score lower on tests.**
- (D) **Students who eat fish 4–6 times per month score higher on tests than those who do not eat fish that often.**
- (E) **Students who eat fish 7 times per month score lower on tests than those who do not eat fish that often.**

Sample Multiple-Choice Question—Algebra

This sample question measures eighth-graders' performance in the algebra content area. It addresses the "Algebraic representations" subtopic, which focuses on analyzing, interpreting, and translating among different representations of linear relationships; representing points in a rectangular coordinate system; and recognizing common nonlinear relationships in meaningful contexts. The framework objective measured by this question is "Translate between different representations of linear expressions using symbols, graphs, tables, diagrams, or written descriptions." A calculator was available for this question.

Forty-three percent of AI/AN eighth-graders selected the correct answer (choice B). The most common incorrect answer selected by AI/AN students (choice D), which was selected by 18 percent of the students, is an alternate way to represent the relationship between the number of cards sold and the profit on Monday, but it does not represent the relationship on the other days. Choice C is another way to represent the relationship on Monday only. Choice A results from interchanging the variables for the number of cards sold and the amount of profit, and choice E can be obtained by interchanging the variables and considering Thursday only.

Percentage of eighth-grade students in each response category in 2007

Student group	Choice A	Choice B	Choice C	Choice D	Choice E	Omitted
Nation (all students)	17	**54**	13	9	6	1
AI/AN students	17	**43**	17	18	5	1

NOTE: AI/AN = American Indian/Alaska Native. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
Number Sold, n	4	0	5	2	3	6
Profit, p	$2.00	$0.00	$2.50	$1.00	$1.50	$3.00

Angela makes and sells special-occasion greeting cards. The table above shows the relationship between the number of cards sold and her profit. Based on the data in the table, which of the following equations shows how the number of cards sold and profit (in dollars) are related?

(A) $p = 2n$

(B) $p = 0.5n$

(C) $p = n - 2$

(D) $p = 6 - n$

(E) $p = n + 1$

Technical Notes

Sampling and Weighting

The schools and students participating in NAEP assessments are selected to be representative both nationally and for public schools at the state level. While national and regional results reflect the performance of students in public schools, Bureau of Indian Education (BIE) schools[1], Department of Defense schools, and private schools, state-level results presented in this report reflect the performance of public and BIE school students only. For comparison purposes within the state results section, the national sample is composed of public and BIE school students only.

The samples of American Indian/Alaska Native students participating in the 2007 NAEP reading and mathematics assessments represent augmentations of the sample of American Indian/Alaska Native students who would usually be selected by NAEP. This allows more detailed reporting of performance for this group. Prior to 2005, BIE schools were identified as part of the national sample, and the resulting number of participating schools was usually small, fewer than five per grade. In 2005, BIE schools were sampled as a part of each state sample, at the same rate as public schools in a given state. That means, roughly speaking, that a BIE student had the same probability of selection as a public school student in the same state. As a result, about 30 BIE schools were included per grade, thereby increasing the number of American Indian/Alaska Native students in the sample. In 2007, there were even larger samples of BIE schools than in 2005. All BIE schools and students were included in the sample. The BIE population represents approximately 135 schools at grade 4 and 115 schools at grade 8. In terms of the number of students, the BIE population represents approximately 3,000 students at grade 4 and 3,100 students at grade 8.

In 2005, seven states had sufficient samples of AI/AN students to report state-level data. In 2007, a total of 11 states had sufficiently large samples, with Minnesota, North Carolina, Oregon, and Washington being added to the original 7 selected states from 2005. While 6 of the 11 selected states had sufficient AI/AN students without oversampling, schools in 5 of the selected states were oversampled in 2007: Arizona, Minnesota, North Carolina, Oregon, and Washington. Schools with relatively large percentages (at least 10%) of AI/AN students were oversampled by factors ranging from 2 to 6 based on state and grade. When AI/AN students are widely dispersed among schools, school oversampling is not effective.

The basic approach taken was to create a new stratum in each state that contains schools with a "high" percentage of AI/AN students, and then to increase the "measure of size" of these schools by an oversampling factor, thereby increasing their probability of selection. The increase in the expected sample size of AI/AN students was then calculated.

Using different sampling rates for different subgroups of the population, and consequently applying different weights, is generally not as efficient as a sampling scheme which gives each unit in the population an equal chance of selection. The precision achieved by a sample selected in this way could be achieved by a smaller sample size (typically called the "effective" sample size) if sampling rates were the same for each subgroup.

Table TN-1. **Number of participating schools with AI/AN students and number of participating AI/AN students, by grade, subject, and type of school: 2007**

	Grade 4				Grade 8			
	Reading		Mathematics		Reading		Mathematics	
Type of school	Schools	Students	Schools	Students	Schools	Students	Schools	Students
Public	1,330	4,300	1,300	4,500	1,150	3,700	1,150	3,600
BIE	120	1,000	120	1,100	100	1,000	100	1,000

NOTE: AI/AN = American Indian/Alaska Native. BIE = Bureau of Indian Education. The numbers of schools are rounded to the nearest ten, and the numbers of students are rounded to the nearest hundred. Numbers are not shown for Department of Defense and private schools.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

[1] In 2005, referred to as Bureau of Indian Affairs (BIA) schools.

In the process of identifying viable options for oversampling AI/AN students, it was necessary to make some assumptions:

- that a maximum of 50, but ideally no more than 25–30, schools be added to the state sample for each grade;
- that an effective student sample size of about 100 is required per subject per grade in each state; and
- that there is no substantial increase in the design effect resulting from the increased clustering of sampled AI/AN students.

Each school that participated in the assessment, and each student assessed, represents a portion of the population of interest. Results are weighted to make appropriate inferences between the student samples and the respective populations from which they are drawn. Sampling weights account for the disproportionate representation of the selected sample. This includes oversampling of schools with high concentrations of students from certain minority groups and lower sampling rates of students who attend very small nonpublic schools.

School and Student Participation Rates

To ensure unbiased samples, NCES and the Governing Board established participation rate standards that states were required to meet in order for their results to be reported. The required participation rate of at least 85 percent was met by the populations for which results are presented in this report. In both reading and mathematics, the national school participation rates were 98 percent for grade 4 and 97 percent for grade 8; and the student participation rates were 95 percent for grade 4 and 92 percent for grade 8. Student participation rates for American Indian/Alaska Native students were 93 percent for grade 4 in reading and mathematics, 91 percent in grade 8 mathematics, and 92 percent in grade 8 reading. School participation rates for BIE schools were 87 percent in grade 4 and 86 percent in grade 8 in both reading and mathematics.

Interpreting Statistical Significance

Comparisons over time or between groups are based on statistical tests that consider both the size of the differences and the standard errors of the two statistics being compared. Standard errors are margins of error, and estimates based on smaller groups are likely to have larger margins of error. The size of the standard errors may also be influenced by other factors such as how representative the students assessed are of the entire population.

When an estimate has a large standard error, a numerical difference that seems large may not be statistically significant. Differences of the same magnitude may or may not be statistically significant depending upon the size of the standard errors of the estimates. For example, a 2-point gain between 2005 and 2007 for non-AI/AN students may be statistically significant, while a 2-point gain for AI/AN students may not be.

Race/Ethnicity

In all NAEP assessments, data about student race/ethnicity are collected from two sources: school records and student self-reports. Prior to 2002, NAEP used students' self-reported race as the primary race/ethnicity reporting variable. Beginning in 2002, the race/ethnicity variable presented in NAEP reports has been based on the race reported by the school. When school-recorded information is missing, student-reported data are used to determine race/ethnicity.

Schools sampled for NAEP are asked to provide lists of all students in the target grade(s) along with basic demographic information, including race/ethnicity. Students are categorized into one of five mutually exclusive categories plus "other." Administration Schedules—also referred to as student rosters—are created that include the list of sampled students along with their basic demographic information. These data are checked and updated during data collection. This race/ethnicity information is available for all sampled students: those who participated and those who were absent or excluded.

All students who take a NAEP assessment complete a section of general student background questions, including questions about their race/ethnicity. Separate questions are asked about students' Hispanic ethnic background and about students' race. This race/ethnicity information is available only for students who participated in the assessment and not for those who were absent or excluded.

The mutually exclusive racial/ethnic categories are White (non-Hispanic), Black (non-Hispanic), Hispanic, Asian/Pacific Islander, American Indian (including Alaska Native), and Unclassified. Unclassified students are those whose school-reported race was "other," "unavailable," or missing, or who self-reported more than one race category (i.e., "multi-racial") or none. Hispanic students may be of any race. Information based on student self-reported race/ethnicity is available on the NAEP Data Explorer (http://nces.ed.gov/nationsreportcard/nde).

National School Lunch Program

NAEP first began collecting data in 1996 on student eligibility for the National School Lunch Program (NSLP) as an indicator of poverty. Under the guidelines of NSLP, children from families with incomes below 130 percent of the poverty level are eligible for free meals. Those from families with incomes between 130 and 185 percent of the poverty level are eligible for reduced-price meals. (For the period July 1, 2006 through June 30, 2007, for a family of four, 130 percent of the poverty level was $26,000, and 185 percent was $37,000.) For more information on NSLP, visit http://www.fns.usda.gov/cnd/lunch/.

School Density

School density indicates the proportion of AI/AN students enrolled in a given school. High density schools are defined by the Office of Indian Education (OIE) as schools in which at least 25 percent of the students are American Indian or Alaska Native. All other schools are classified as low density. This concept has been used by educational researchers for many years and is the basis for the terms "low Indian enrollment" and "high Indian enrollment" schools.

Bureau of Indian Education Schools

There are 184 BIE schools and dormitories located on or near 63 reservations that serve approximately 47,000 students in 23 states. Schools funded by the BIE are either operated by the BIE or by tribes under contracts or grants. BIE-operated schools are under the direct auspices of the BIE, and tribally operated schools are managed by individual federally recognized tribes with grants or contracts from the BIE. The BIE, formerly the Office of Indian Education Programs, in the Department of the Interior, oversees the BIE elementary and secondary school programs.

Type of Location

NAEP results are reported for four mutually exclusive categories of school locations: city, suburb, town, and rural. The categories are based on standard definitions established by the Federal Office of Management and Budget using population and geographic information from the U.S. Census Bureau. Schools are assigned to these categories in the NCES Common Core of Data (CCD) based on their physical address. The classification system was revised for 2007; therefore, trend comparisons to previous years are not available. The new categories ("locale codes") are based on a school's proximity to an urbanized area (a densely settled core with densely settled surrounding areas). This is a change from the original system based on metropolitan statistical areas. To distinguish the two systems, the new system is referred to as "urban-centric locale codes." More detail on the locale codes is available at http://nces.ed.gov/ccd/rural_locales.asp.

The urban-centric locale code system classifies territory into four major types: city, suburban, town, and rural. Each type has three subcategories. For city and suburb, these are gradations of size—large, midsize, and small. Towns and rural areas are further distinguished by their distance from an urbanized area. They can be characterized as fringe, distant, or remote.

One of the primary advantages of the locale framework is the use of explicit distance measures to identify town and rural subtypes. Unlike the previous CCD framework that differentiates towns on the basis of population size, the new typology classifies towns according to their proximity to larger urban cores. This approach considers potential spatial relationships and acknowledges the likely interaction between urban cores based on their relative locations. Rural subtypes are similar in that they identify rural territory relative to urban cores. This distinction avoids the often-misleading distance proxy based on county metro status. More importantly, the explicit distance indicators offer the opportunity to identify and differentiate rural schools and school systems in relatively remote areas, from those that may be located just outside an urban core.

Table TN-2. **Definitions of the 12 urban-centric locale code categories: 2006**

City	
City, Large:	Territory inside an urbanized area and inside a principal city with population of 250,000 or more.
City, Midsize:	Territory inside an urbanized area and inside a principal city with population less than 250,000 and greater than or equal to 100,000.
City, Small:	Territory inside an urbanized area and inside a principal city with population less than 100,000.
Suburb	
Suburb, Large:	Territory outside a principal city and inside an urbanized area with population of 250,000 or more.
Suburb, Midsize:	Territory outside a principal city and inside an urbanized area with population less than 250,000 and greater than or equal to 100,000.
Suburb, Small:	Territory outside a principal city and inside an urbanized area with population less than 100,000.
Town	
Town, Fringe:	Territory inside an urban cluster that is less than or equal to 10 miles from an urbanized area.
Town, Distant:	Territory inside an urban cluster that is more than 10 miles and less than or equal to 35 miles from an urbanized area.
Town, Remote:	Territory inside an urban cluster that is more than 35 miles from an urbanized area.
Rural	
Rural, Fringe:	Census-defined rural territory that is less than or equal to 5 miles from an urbanized area, as well as rural territory that is less than or equal to 2.5 miles from an urban cluster.
Rural, Distant:	Census-defined rural territory that is more than 5 miles but less than or equal to 25 miles from an urbanized area, as well as rural territory that is more than 2.5 miles but less than or equal to 10 miles from an urban cluster.
Rural, Remote:	Census-defined rural territory that is more than 25 miles from an urbanized area and is also more than 10 miles from an urban cluster.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Documentation to the NCES Common Core of Data Public Elementary/Secondary School Locale Code File: School Year 2003–04," (NCES 2006–332).

Drawing Inferences From the Results

The reported statistics are estimates and are therefore subject to a measure of uncertainty. There are two sources of such uncertainty. First, NAEP uses a sample of students rather than testing all students. Second, all assessments have some amount of uncertainty related to the fact that they cannot ask all questions that might be asked in a content area. The magnitude of this uncertainty is reflected in the standard error of each of the estimates. When the percentages or average scale scores of certain groups are compared, the estimated standard error should be taken into account. Therefore, the comparisons are based on statistical tests that consider the estimated standard errors of the statistics being compared and the magnitude of the difference between the averages or percentages.

The differences between statistics—such as comparisons of two groups of students' average scale scores and percentages of students at various achievement levels—that are discussed in this report are determined by using standard errors. Comparisons are based on statistical tests that consider both the size of the differences and the standard errors of the two statistics being compared. Estimates based on smaller groups are likely to have relatively large standard errors. As a consequence, a numerical difference that seems large may not be statistically significant. Furthermore, differences of the same magnitude may or may not be statistically significant, depending upon the size of the standard errors of the statistics. For example, a 2-point gain between 2005 and 2007 for non-AI/AN students may be statistically significant, while a 2-point gain for AI/AN students may not be. The differences described in this report have been determined to be statistically significant at the .05 level with appropriate adjustments for part-to-whole and multiple comparisons (Benjamini and Hochberg 1995).

Any difference between scores or percentages that is identified as higher, lower, larger, or smaller in this report, including within-group differences not marked in tables and charts, meets the requirements for statistical significance.

While the standard error reflects the precision of the sample mean, the standard deviation reflects the variability of scores within a group in the original scale of measurement. Thus, standard deviations for two groups can be used to understand both the variability of NAEP reading and mathematics scores among AI/AN students, and among all other students at each grade level. Table TN-3 shows the standard deviations of the scores of AI/AN students and of all other students for each subject and grade.

Table TN-3. **Standard deviations of NAEP average scores, by student group, grade, and subject: 2007**

Grade and subject	Standard deviation	
	AI/AN students	Non-AI/AN students
Grade 4		
Reading	40.2	35.6
Mathematics	30.1	28.6
Grade 8		
Reading	38.5	34.8
Mathematics	36.4	36.0

NOTE: AI/AN = American Indian/Alaska Native.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

The standard deviation measures how widely spread the values in a data set are. If many data points are close to the mean, then the standard deviation is small; if many data points are far from the mean, then the standard deviation is large.

Weighting and Variance Estimation

A complex sample design was used to select the students who were assessed. The properties of a sample selected through such a design could be very different from those of a simple random sample, in which every student in the target population has an equal chance of selection and in which the observations from different sampled students can be considered to be statistically independent of one another. Therefore, the properties of the sample for the data collection design were taken into account during the analysis of the assessment data.

One way that the properties of the sample design were addressed was by using sampling weights to account for the fact that the probabilities of selection were not identical for all students. All population and subpopulation characteristics based on the assessment data were estimated using sampling weights. These weights included adjustments for school and student nonresponse.

Not only must appropriate estimates of population characteristics be derived, but appropriate measures of the degree of uncertainty must be obtained for those statistics. Two components of uncertainty are accounted for in the variability of statistics based on student ability: (1) the uncertainty due to sampling only a relatively small number of students, and (2) the uncertainty due to sampling only a relatively small number of cognitive questions. The first component accounts for the variability associated with the estimated percentages of students who had certain background characteristics or who had a certain rating for their responses to a task.

Because NAEP uses complex sampling procedures, conventional formulas for estimating sampling variability that assume simple random sampling are inappropriate. NAEP uses a jackknife replication procedure to estimate standard errors. The jackknife standard error provides a reasonable measure of uncertainty for any student information that can be observed without error. However, because each student typically responds to only a few questions within a content area, the scale score for any single student would be imprecise. In this case, NAEP's marginal estimation methodology can be used to describe the performance of groups and subgroups of students. The estimate of the variance of the students' posterior scale score distributions (which reflect the imprecision due to lack of measurement accuracy) is computed. This component of variability is then included in the standard errors of NAEP scale scores.

Analyzing Group Differences in Averages and Percentages

Statistical tests determine whether, based on the data from the groups in the sample, there is strong enough evidence to conclude that the averages or percentages are actually different for those groups in the population. If the evidence is strong (i.e., the difference is statistically significant), the report describes the group averages or percentages as being different (e.g., one group performed higher or lower than another group), regardless of whether the sample averages or percentages appear to be approximately the same. The reader is cautioned to rely on the results of the statistical tests rather than on the apparent magnitude of the difference between sample averages or percentages when determining whether the sample differences are likely to represent actual differences among the groups in the population.

To determine whether a real difference exists between the average scale scores (or percentages of a certain attribute) for two groups in the population, one needs to obtain an estimate of the degree of uncertainty associated with the difference between the averages (or percentages) of these groups for the sample. This estimate of the degree of uncertainty, called the "standard error of the difference" between the groups, is obtained by taking the square of each group's standard error, summing the squared standard errors, and taking the square root of that sum.

$$SE_{A-B} = \sqrt{(SE_A^2 + SE_B^2)}$$

The standard error of the difference can be used, just like the standard error for an individual group average or percentage, to help determine whether differences among groups in the population are real. The difference between the averages or percentages of the two groups plus or minus 1.96 standard errors of the difference represents an approximately 95 percent confidence interval. If the resulting interval includes zero, there is insufficient evidence to claim a real difference between the groups in the population. If the interval does not contain zero, the difference between the groups is statistically significant at the .05 level.

The following example of comparing groups addresses the problem of determining whether the average mathematics scale score of group A is higher than that of group B. The sample estimates of the average scale scores and estimated standard errors are as follows:

Group	Average scale score	Standard error
A	218	0.9
B	216	1.1

The difference between the estimates of the average scale scores of groups A and B is 2 points (218 – 216). The standard error of this difference is

$$\sqrt{(0.9^2 + 1.1^2)} = 1.4$$

Thus, an approximately 95 percent confidence interval for this difference is plus or minus 1.96 standard errors of the difference:

$$2 \pm 1.96 \times 1.4$$
$$2 \pm 2.7$$
$$(-0.7, 4.7)$$

The value zero is within the confidence interval; therefore, there is insufficient evidence to conclude that group A's performance is statistically different from group B.
The procedure above is appropriate to use when it is reasonable to assume that the groups being compared have been independently sampled for the assessment. Such an assumption is clearly warranted when comparing results for one state with another. This is the approach used for NAEP reports when comparisons involving independent groups are made. The assumption of independence is violated to some degree when comparing group results for the nation or a particular state (e.g., comparing national 2005 results for male and female students), since these samples of students have been drawn from the same schools.

When the groups being compared do not share students (as is the case, for example, of comparing male and female students), the impact of this violation of the independence assumption on the outcome of the statistical tests is assumed to be small, and NAEP, by convention, has, for computational convenience, routinely applied the procedures described above to those cases as well.

When making comparisons of results for groups that share a considerable proportion of students in common, it is not appropriate to ignore such dependencies. In such cases, NAEP has used procedures appropriate to comparing dependent groups. When the dependence in group results is due to the overlap in samples (e.g., when a subgroup is being compared to a total group), a simple modification of the usual standard error of the difference formula can be used. The formula for such cases is

$$SE_{\text{Total-Subgroup}} = \sqrt{(SE^2_{\text{Total}} + SE^2_{\text{Subgroup}} - 2pSE^2_{\text{Subgroup}})}$$

where p is the proportion of the total group contained in the subgroup. This formula was used for this report when a state was compared to the aggregate nation.

Conducting Multiple Tests

The procedures used to determine whether group differences in the samples represent actual differences among the groups in the population and the certainty ascribed to intervals (e.g., a 95 percent confidence interval) are based on statistical theory that assumes that only one confidence interval or test of statistical significance is being performed. However, there are times when many different groups are being compared (i.e., multiple sets of confidence intervals are being analyzed). For multiple comparisons, statistical theory indicates that the certainty associated with the entire set of comparisons is less than that attributable to each individual comparison from the set. To hold the significance level for the set of comparisons at a particular level (e.g., .05), the standard methods must be adjusted by multiple comparison procedures (Miller 1981). The procedure used by NAEP is the Benjamini-Hochberg False Discovery Rate (FDR) procedure (Benjamini and Hochberg 1995).

Unlike other multiple comparison procedures that control the familywise error rate (i.e., the probability of making even one false rejection in the set of comparisons), the FDR procedure controls the expected proportion of falsely rejected hypotheses. (A "family" in this context is the number of categories to be compared for a given variable. This might be 6 within the race/ethnicity variable or 50 when considering states.) Furthermore, the FDR procedure used in NAEP is considered appropriately less conservative than familywise procedures for large families of comparisons (Williams, Jones, and Tukey 1999). Therefore, the FDR procedure is more suitable for multiple comparisons in NAEP than are other procedures.

Cautions in Interpretation

It is possible to examine NAEP performance results for groups of students defined by various background factors measured by NAEP, such as whether their teachers use certain instructional techniques or how much reading material is available in their homes. However, a relationship that exists between achievement and another variable does not reveal its underlying cause, which may be influenced by a number of other variables. Similarly, the assessments do not reflect the influence of unmeasured variables. The results are most useful when they are considered in combination with other knowledge about the student population and the educational system, such as trends in instruction, changes in the school-age population, and societal demands and expectations.

Accommodations and Exclusions in NAEP

Testing accommodations, such as extra testing time or individual rather than group administration, are provided for students with disabilities or English language learners who could not fairly and accurately demonstrate their abilities without modified test administration procedures.

Even with the availability of accommodations, there still remains a portion of students excluded from the NAEP assessment. Variations in exclusion and accommodation rates, due to differences in policies and practices regarding the identification and inclusion of students with disabilities and English

Table TN-4. AI/AN students with disabilities and English language learners identified, excluded, and assessed in NAEP reading, as a percentage of all AI/AN students, by grade and selected states: 2007

	Students with disabilities				English language learners			
Grade and state	Identified	Excluded	Assessed with accommodations	Assessed without accommodations	Identified	Excluded	Assessed with accommodations	Assessed without accommodations
Grade 4								
Nation	17	6	6	4	10	1	2	7
Alaska	18	4	8	7	28	4	6	17
Arizona	14	5	7	3	22	3	2	17
Minnesota	22	8	7	7	3	#	1	1
Montana	15	5	8	2	28	3	11	14
New Mexico	14	6	4	4	41	6	6	30
North Carolina	21	5	11	5	#	#	#	#
North Dakota	26	14	4	8	8	3	1	4
Oklahoma	19	9	6	4	1	1	#	#
Oregon	21	3	3	14	11	#	#	11
South Dakota	19	9	3	7	12	2	1	9
Washington	19	8	4	7	1	#	#	1
Grade 8								
Nation	17	5	8	4	9	1	2	6
Alaska	16	2	10	4	37	1	13	23
Arizona	14	6	5	2	13	2	3	8
Minnesota	22	8	9	5	#	#	#	#
Montana	22	6	12	4	31	4	12	16
New Mexico	15	6	4	5	33	4	4	25
North Carolina	11	2	8	1	#	#	#	#
North Dakota	24	14	4	6	15	5	2	8
Oklahoma	16	6	7	4	1	#	#	1
Oregon	15	4	8	3	5	#	1	4
South Dakota	17	7	5	5	6	1	1	4
Washington	15	3	9	2	2	#	#	1

Rounds to zero.
NOTE: AI/AN = American Indian/Alaska Native. The national and state results reported here include only public and Bureau of Indian Education (BIE) schools.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

language learners, should be taken into consideration when comparing students' performance over time and across states. While the effect of exclusion is not precisely known, comparisons of performance results could be affected if exclusion rates are comparatively high or vary widely over time. More information about NAEP's policy on inclusion of special-needs students is available at http://nces.ed.gov/nationsreportcard/about/inclusion.asp.

Tables TN-4 and TN-5 show the percentages of AI/AN students identified as students with disabilities or English language learners, excluded, and assessed with accommodations for the nation and selected states for 2007.

Table TN-5. **AI/AN students with disabilities and English language learners identified, excluded, and assessed in NAEP mathematics, as a percentage of all AI/AN students, by grade and selected states: 2007**

	Students with disabilities				English language learners			
Grade and state	Identified	Excluded	Assessed with accommodations	Assessed without accommodations	Identified	Excluded	Assessed with accommodations	Assessed without accommodations
Grade 4								
Nation	17	3	10	4	9	#	3	6
Alaska	19	2	12	5	28	#	9	18
Arizona	13	2	8	3	20	#	6	14
Minnesota	19	4	12	4	1	#	#	1
Montana	15	3	10	2	26	2	9	14
New Mexico	12	4	6	3	38	2	11	25
North Carolina	17	2	11	4	#	#	#	#
North Dakota	23	6	13	4	9	2	3	4
Oklahoma	17	6	7	4	1	#	#	1
Oregon	22	2	13	7	6	#	2	4
South Dakota	17	1	9	7	14	#	3	11
Washington	21	5	13	3	1	#	#	1
Grade 8								
Nation	16	4	8	4	9	1	2	6
Alaska	18	4	9	4	36	1	11	24
Arizona	13	3	4	6	14	2	2	10
Minnesota	27	3	19	5	#	#	#	#
Montana	21	6	12	3	33	3	11	19
New Mexico	12	2	6	4	35	1	9	26
North Carolina	22	1	16	5	#	#	#	#
North Dakota	24	8	13	3	16	3	5	8
Oklahoma	17	8	6	2	3	#	1	2
Oregon	20	7	8	5	5	1	#	4
South Dakota	17	3	9	5	6	#	1	5
Washington	17	6	9	2	2	#	#	2

Rounds to zero.
NOTE: AI/AN = American Indian/Alaska Native. The national and state results reported here include only public and Bureau of Indian Education (BIE) schools.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

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Data Appendix

Additional data tables (including standard errors) to support the findings in this report can be found at http://nces.ed.gov/nationsreportcard/nies/.

Table A-1. **Average scores and achievement-level results (with standard errors) in NAEP reading, by grade and race/ethnicity: 2007**

Grade and race/ethnicity	Average scale score	Percentage of students: At or above *Basic*	Percentage of students: At or above *Proficient*
Grade 4			
AI/AN	203 (1.2)	49 (1.4)	18 (1.1)
Black	203 (0.4)	46 (0.6)	14* (0.4)
Hispanic	205 (0.5)	50 (0.6)	17 (0.6)
White	231* (0.2)	78* (0.3)	43* (0.4)
Asian/Pacific Islander	232* (1.0)	77* (1.0)	46* (1.4)
Grade 8			
AI/AN	247 (1.2)	56 (1.9)	18 (1.3)
Black	245 (0.4)	55 (0.6)	13* (0.4)
Hispanic	247 (0.4)	58 (0.5)	15 (0.4)
White	272* (0.2)	84* (0.3)	40* (0.3)
Asian/Pacific Islander	271* (1.1)	80* (1.1)	41* (1.1)

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Standard errors of the estimates appear in parentheses.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Table A-2. **Average scores and achievement-level results (with standard errors) in NAEP mathematics, by grade and race/ethnicity: 2007**

Grade and race/ethnicity	Average scale score	Percentage of students: At or above *Basic*	Percentage of students: At or above *Proficient*
Grade 4			
AI/AN	228 (0.7)	70 (1.2)	25 (1.1)
Black	222* (0.3)	64* (0.6)	15* (0.4)
Hispanic	227 (0.3)	70 (0.5)	22* (0.4)
White	248* (0.2)	91* (0.2)	51* (0.4)
Asian/Pacific Islander	253* (0.8)	91* (0.7)	58* (1.3)
Grade 8			
AI/AN	264 (1.2)	53 (1.8)	16 (1.2)
Black	260* (0.4)	47* (0.7)	11* (0.3)
Hispanic	265 (0.4)	55 (0.7)	15 (0.4)
White	291* (0.3)	82* (0.3)	42* (0.3)
Asian/Pacific Islander	297* (0.9)	83* (0.8)	50* (1.1)

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Standard errors of the estimates appear in parentheses.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Table A-3. **Percentage of students (with standard errors) in NAEP reading, by type of school location, grade, and selected race/ethnicity categories: 2007**

Grade and race/ethnicity	City	Suburb	Town	Rural
Grade 4				
AI/AN	19 (1.3)	14 (1.3)	20 (1.5)	47 (2.0)
Black	49* (0.8)	31* (0.8)	8* (0.5)	12* (0.5)
Hispanic	46* (1.0)	36* (1.1)	9* (0.8)	9* (0.6)
Grade 8				
AI/AN	17 (1.4)	15 (1.4)	19 (1.8)	49 (2.1)
Black	46* (1.0)	32* (1.0)	8* (0.5)	14* (0.6)
Hispanic	45* (1.2)	36* (1.1)	8* (0.7)	10* (0.8)

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin. Standard errors of the estimates appear in parentheses.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

Table A-4. **Percentage of students (with standard errors) in NAEP mathematics, by type of school location, grade, and selected race/ethnicity categories: 2007**

Grade and race/ethnicity	City	Suburb	Town	Rural
Grade 4				
AI/AN	18 (1.3)	14 (1.3)	20 (1.5)	48 (1.9)
Black	49* (0.8)	30* (0.8)	8* (0.6)	12* (0.5)
Hispanic	46* (1.0)	36* (1.1)	9* (0.7)	9* (0.7)
Grade 8				
AI/AN	17 (1.6)	14 (1.6)	21 (1.8)	48 (2.1)
Black	46* (1.1)	32* (1.0)	8* (0.5)	14* (0.7)
Hispanic	45* (1.1)	37* (1.1)	8* (0.7)	10* (0.8)

* Significantly different ($p < .05$) from AI/AN students.
NOTE: AI/AN = American Indian/Alaska Native. Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin. Standard errors of the estimates appear in parentheses.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 National Indian Education Study.

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Student Artwork: *Untitled* by Michael Curley; tribal affiliation: Zuni

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The National Assessment of Educational Progress (NAEP) is a congressionally authorized project sponsored by the U.S. Department of Education. The National Center for Education Statistics, a department within the Institute of Education Sciences, administers NAEP. The Commissioner of Education Statistics is responsible by law for carrying out the NAEP project.

National Indian Education Study Technical Review Panel 2007

National Indian Education Study: Part I

May 2008

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