



# NAEP 2009 Mathematics Results

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# NAEP 2009 Administration & Results Overview

- NAEP results are based on the state sample. Approximately 3000 students at 4<sup>th</sup> and 8<sup>th</sup> grade are sampled for math during each biennial administration.
- No one student takes the entire test as it would take approximately 6 hours for one subject.
- Results are reported in scale scores, percents at achievement levels, and in percentiles for the state and the nation. District, school, or student data are not reported.
- Results can be disaggregated based on demographic and survey variables.

# Overall Summary of Results for South Dakota

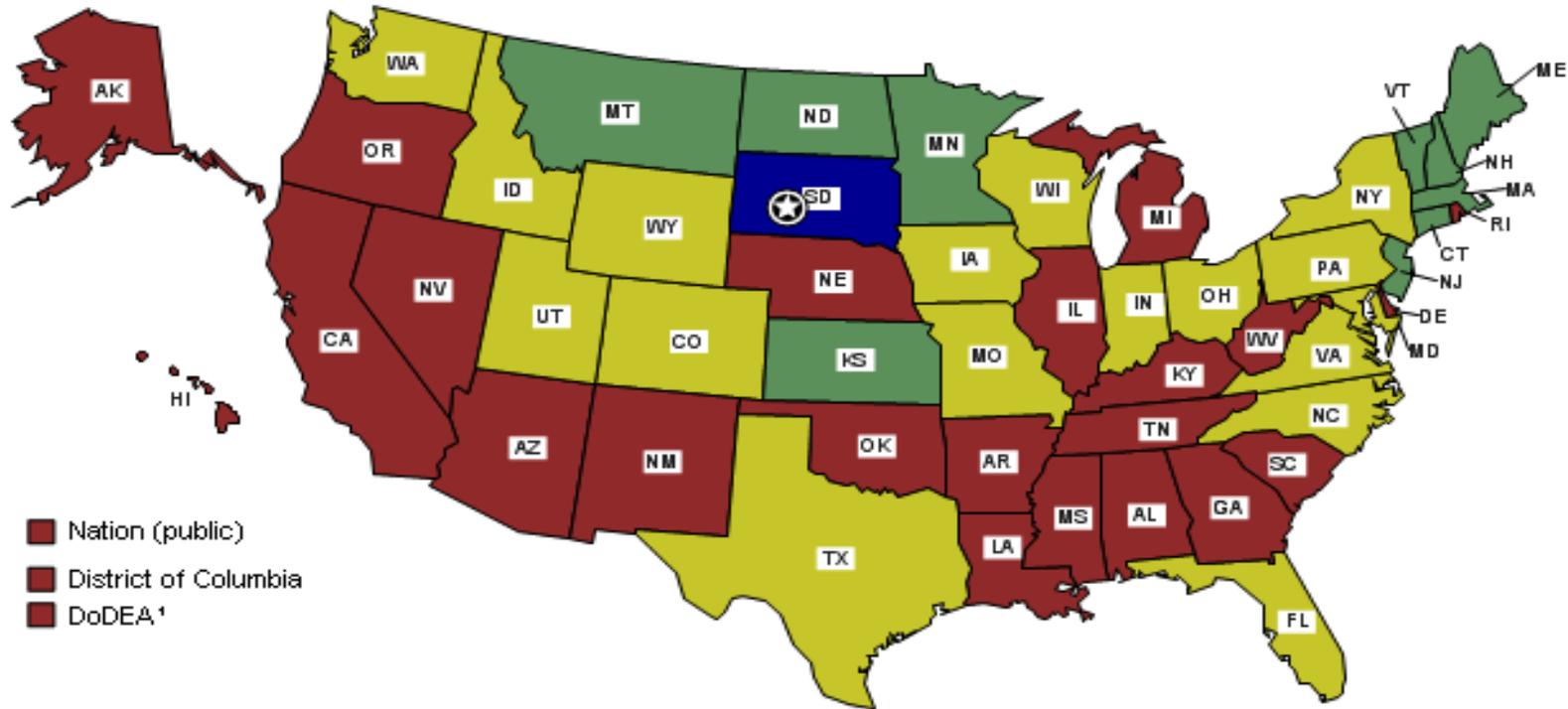
## Grade 4

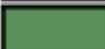
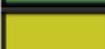
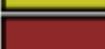
- SD 4<sup>th</sup> graders' average score was 242. This was significantly higher than the nation's public schools (239).
- The score of 242 is significantly higher than in 2003 (237) but not significantly different from 2007 (241).
- The percent of students scoring at or above Proficient was 42% and this was greater than that for the nation's public schools (38%).

## Grade 8

- SD 8<sup>th</sup> graders' average score was 291. This was significantly higher than the nation's public schools (282).
- The score of 291 is significantly higher than in 2003 ( 285) AND 2007 (288).
- The percent of students scoring at or above Proficient was 42% and this was greater than that for the nation's public schools (33%).

# Grade 4 Mathematics

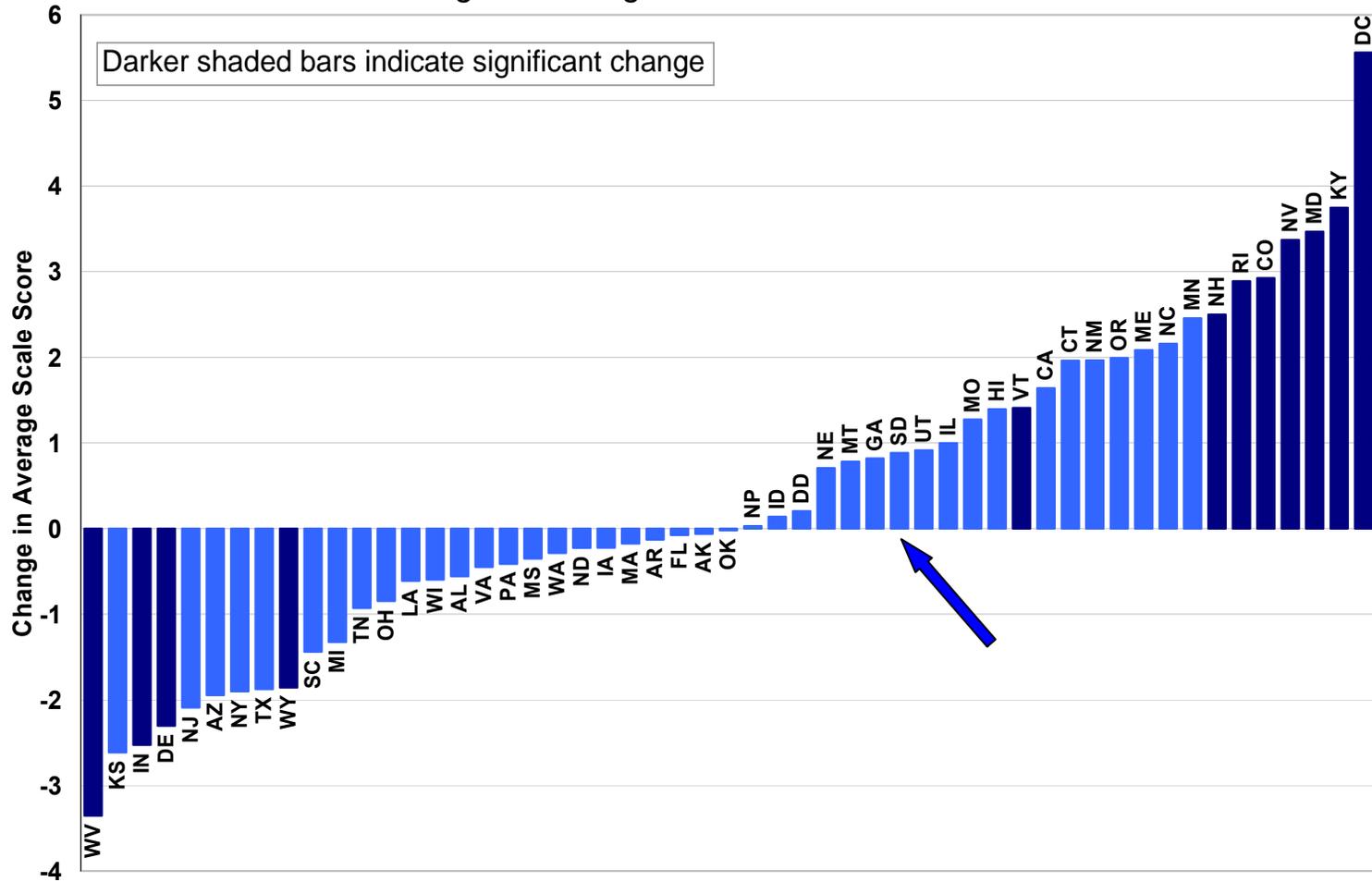


	Focal state/jurisdiction (South Dakota)
	Higher average scale score than South Dakota (10 jurisdictions)
	Not significantly different from South Dakota (17 jurisdictions)
	Lower average scale score than South Dakota (nation and 24 jurisdictions)

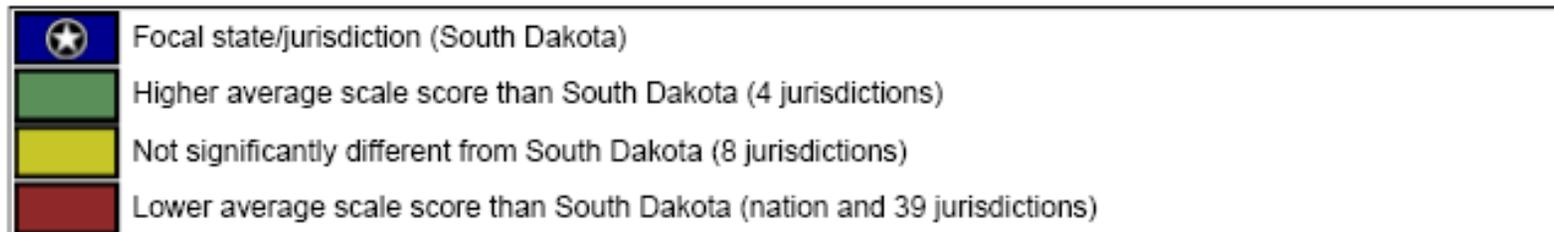
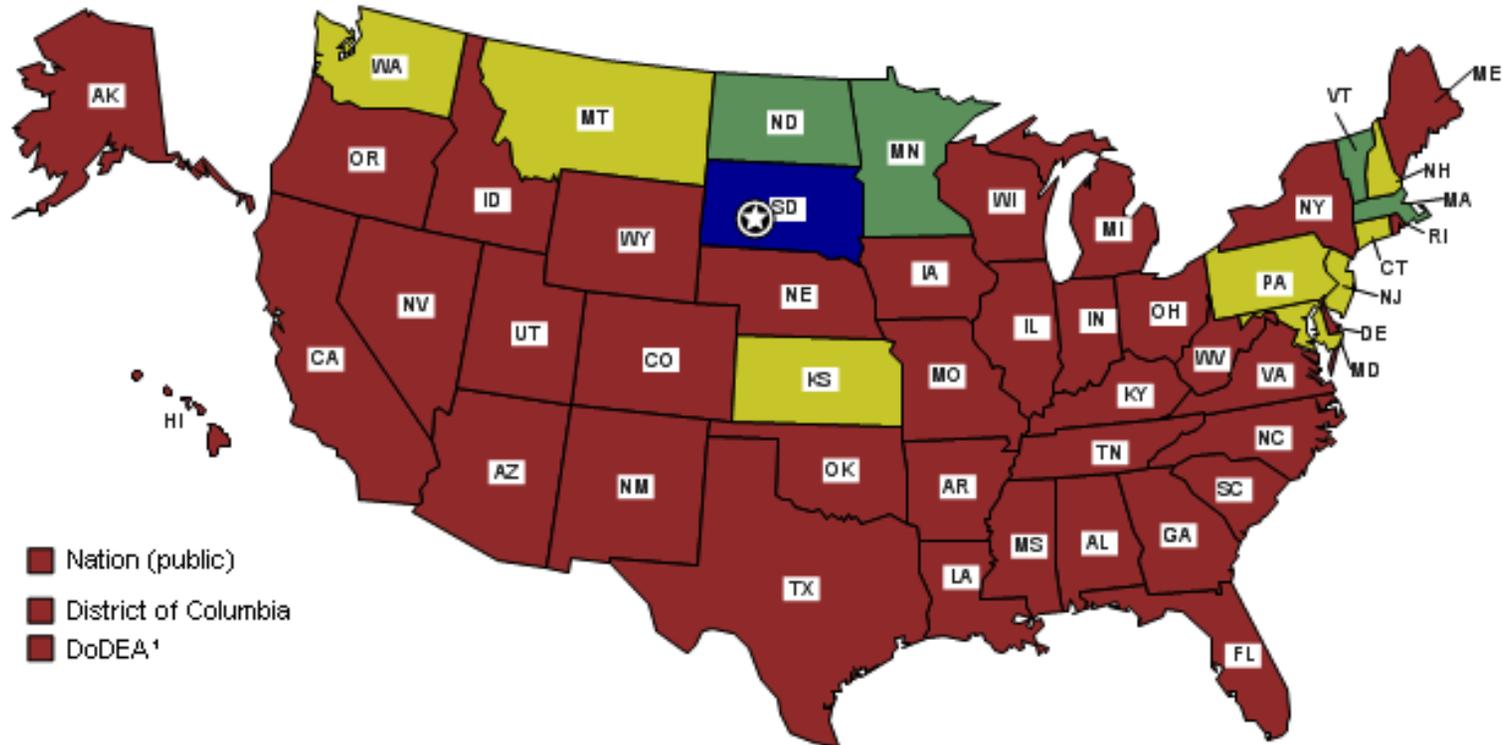
<sup>1</sup> Department of Defense Education Activity schools (domestic and overseas).  
 SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 Mathematics Assessment.

### NAEP Mathematics Grade 4 – Overall

*Change in Average Scale Score: 2007-2009*



## Grade 8 Mathematics

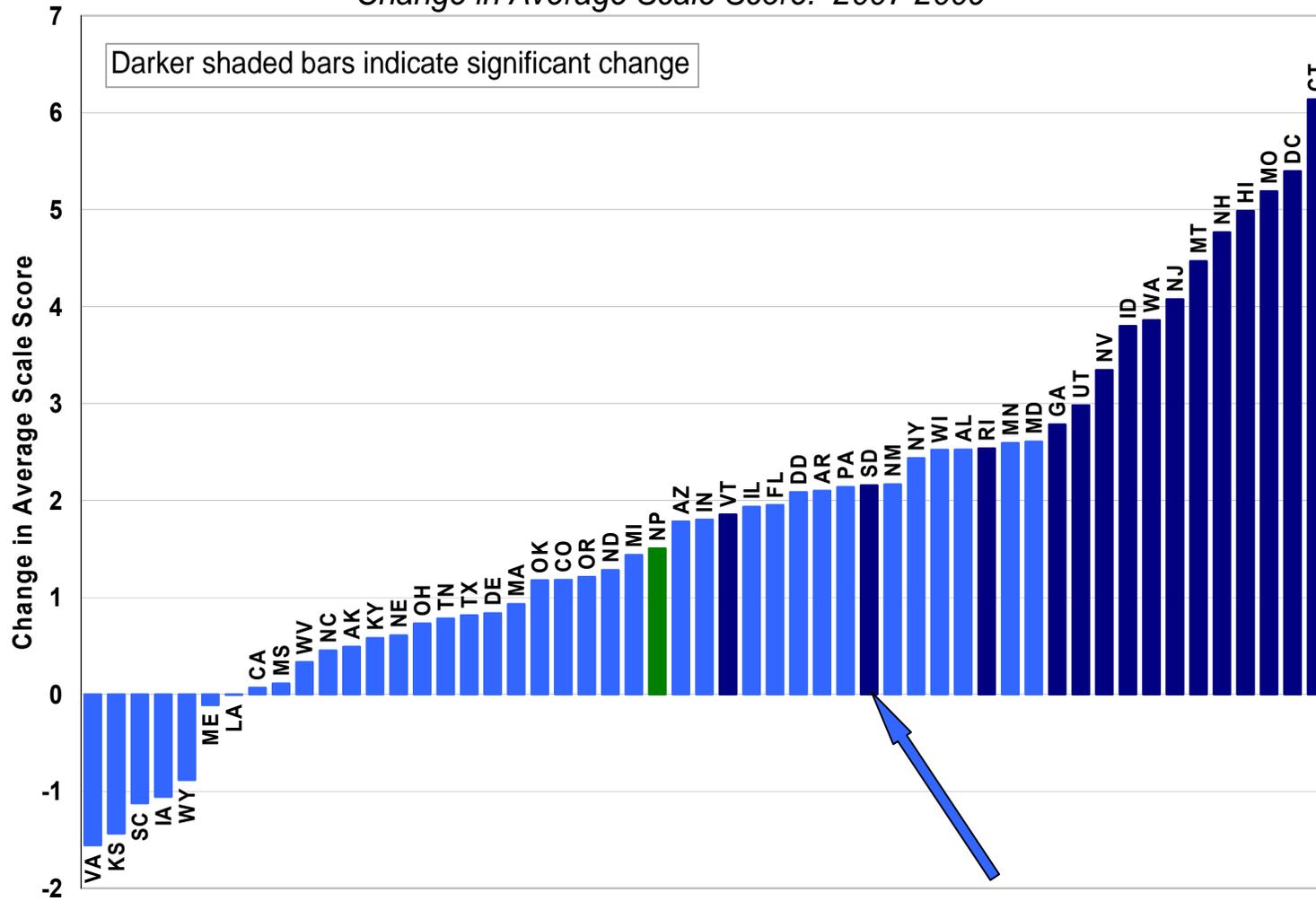


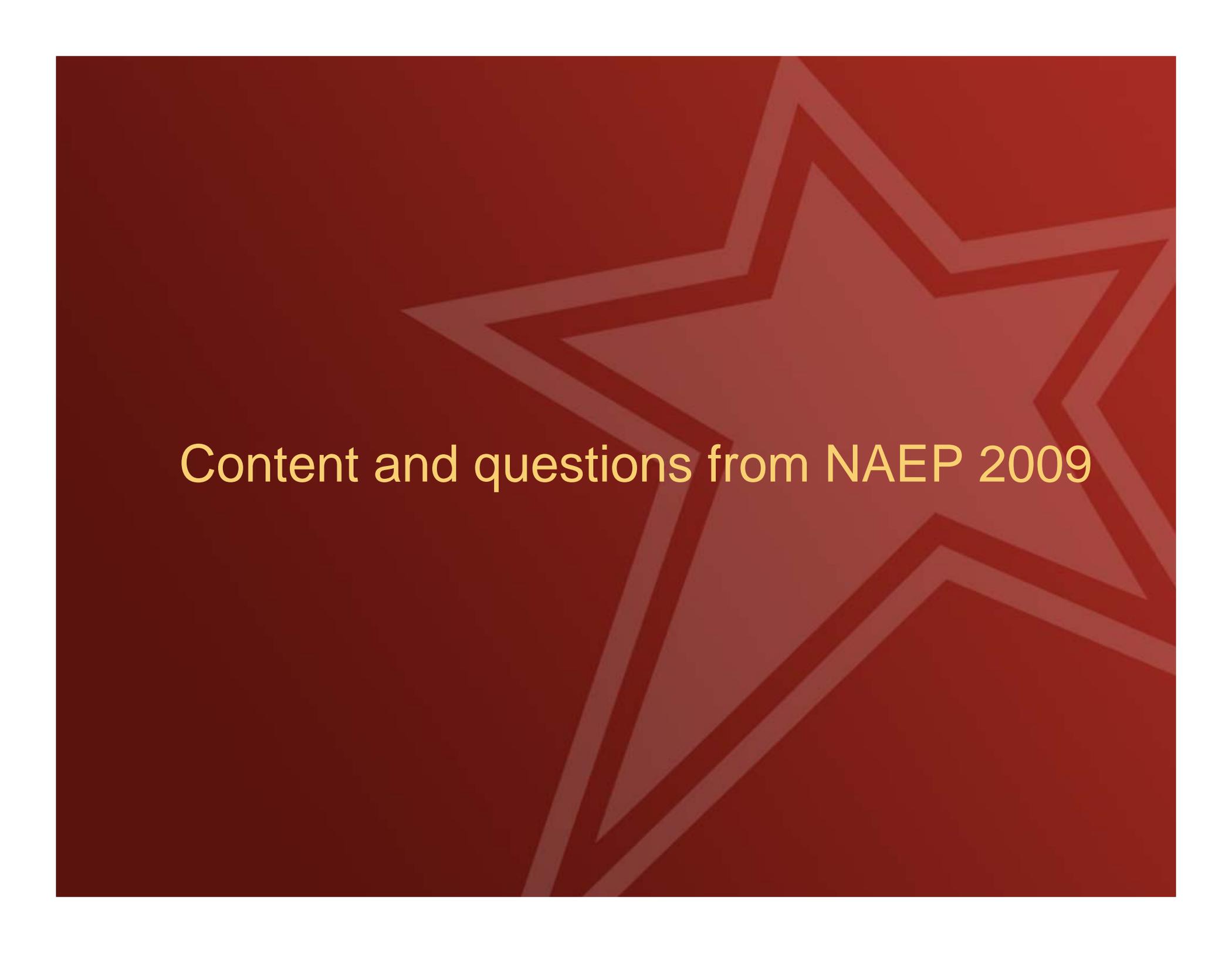
<sup>1</sup> Department of Defense Education Activity schools (domestic and overseas).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 Mathematics Assessment.

## NAEP Mathematics Grade 8 – Overall

Change in Average Scale Score: 2007-2009





# Content and questions from NAEP 2009

## Snapshot of Test Framework

**Content:** Number Properties & Operations, Measurement, Geometry, Algebra, & Data/Probability/Statistics

**Complexity:** Low, Moderate, High

**Item Types:** Multiple Choice, Constructed Response, Extended Constructed Response

**Calculator Use:** Specific blocks allow for calculator use

**Definition of Proficient:** Solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and appropriate analytical skills.

## Item Distribution for Grade 4 and 8

### 4<sup>th</sup> Grade

- Number Properties and Operations 40%
- Algebra 15%
- Geometry 15%
- Measurement 20%
- Data Analysis, Statistics, and Probability 10%

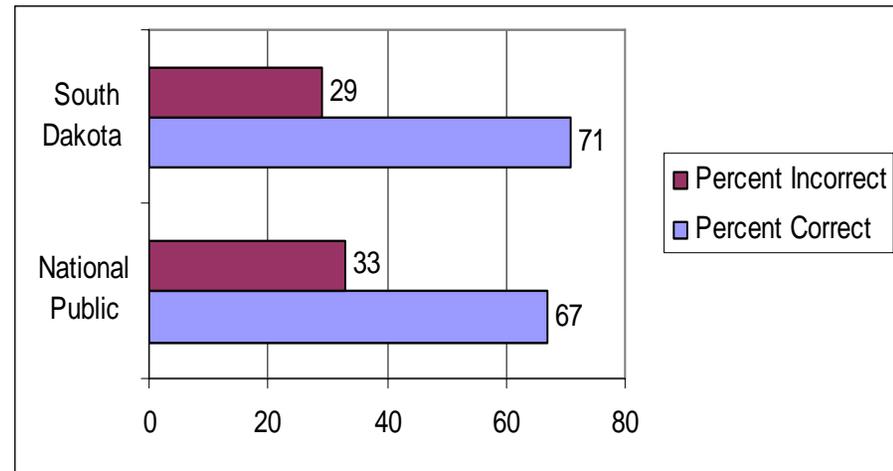
### 8<sup>th</sup> Grade

- Number Properties and Operations 20%
- Algebra 30%
- Geometry 20%
- Measurement 15%
- Data Analysis, Statistics, and Probability 15%

## 4<sup>th</sup> Grade – Number Properties & Operations

$$\begin{array}{r} 301 \\ - 75 \\ \hline \end{array}$$

- A\*. 226
- B. 235
- C. 236
- D. 374



Item is classified as easy.

South Dakota 3<sup>rd</sup> grade standards.

C was the most common incorrect answer.

## How do 4<sup>th</sup> graders compare to 8<sup>th</sup> graders?

A loaded trailer truck weighs 26,643 kilograms. When the trailer truck is empty, it weighs 10,547 kilograms. About how much does the load weigh?

- A. 14,000 kilograms
- \*B. 16,000 kilograms
- C. 18,000 kilograms
- D. 36,000 kilograms

- 52% of South Dakota's 4<sup>th</sup> graders answered correctly compared to 53% nationally.
- **87% of the 8<sup>th</sup> graders answered correctly compared to 84% nationally.**
- For 4th grade, the item is classified as a **medium** item. The same item is classified as **easy** for 8th grade.
- Concept of estimating and solving problems in SD standards starts in 3<sup>rd</sup> grade and 4<sup>th</sup> graders are expected to work with numbers in the ten thousands.

# Gr. 8 Algebra

Write the next two numbers in the number pattern.

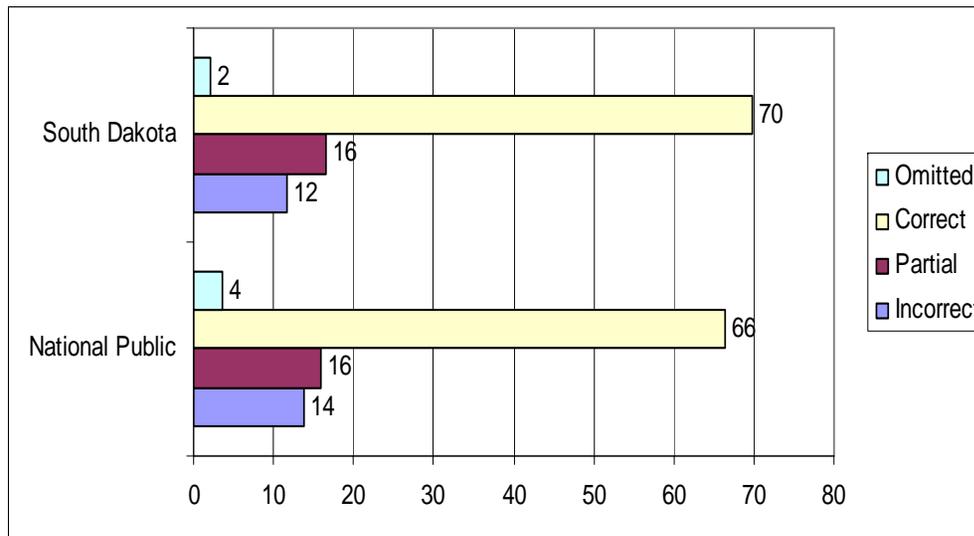
1    6    4    9    7    12    10  
\_\_\_\_\_

Write the rule that you used to find the two numbers you wrote.

Constructed response item

Classified as Easy

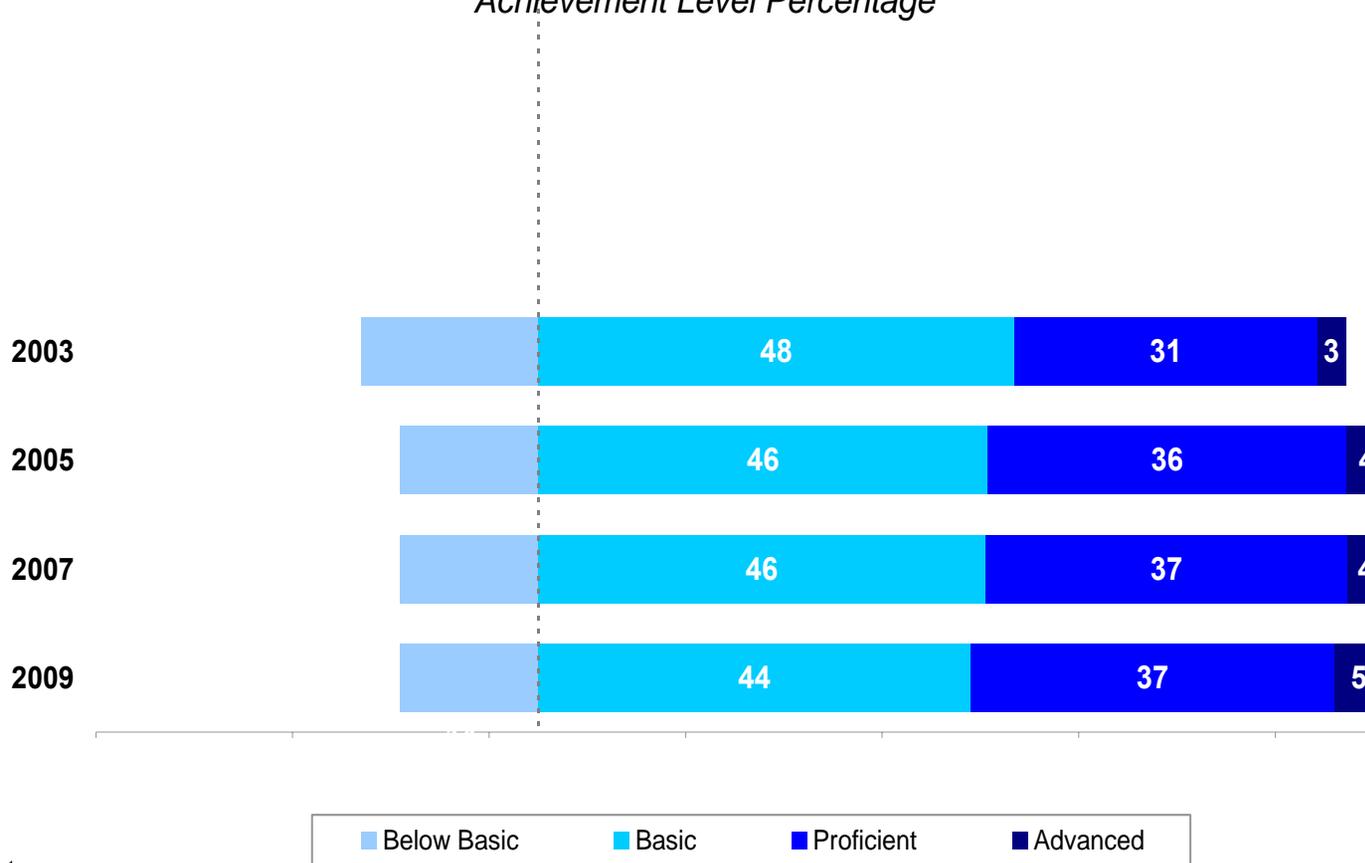
Identifying and extending a number pattern starts in the primary grades in South Dakota standards.





Results:  
Grade 4 Mathematics

**NAEP Mathematics Grade 4 – Overall**  
*Achievement Level Percentage*



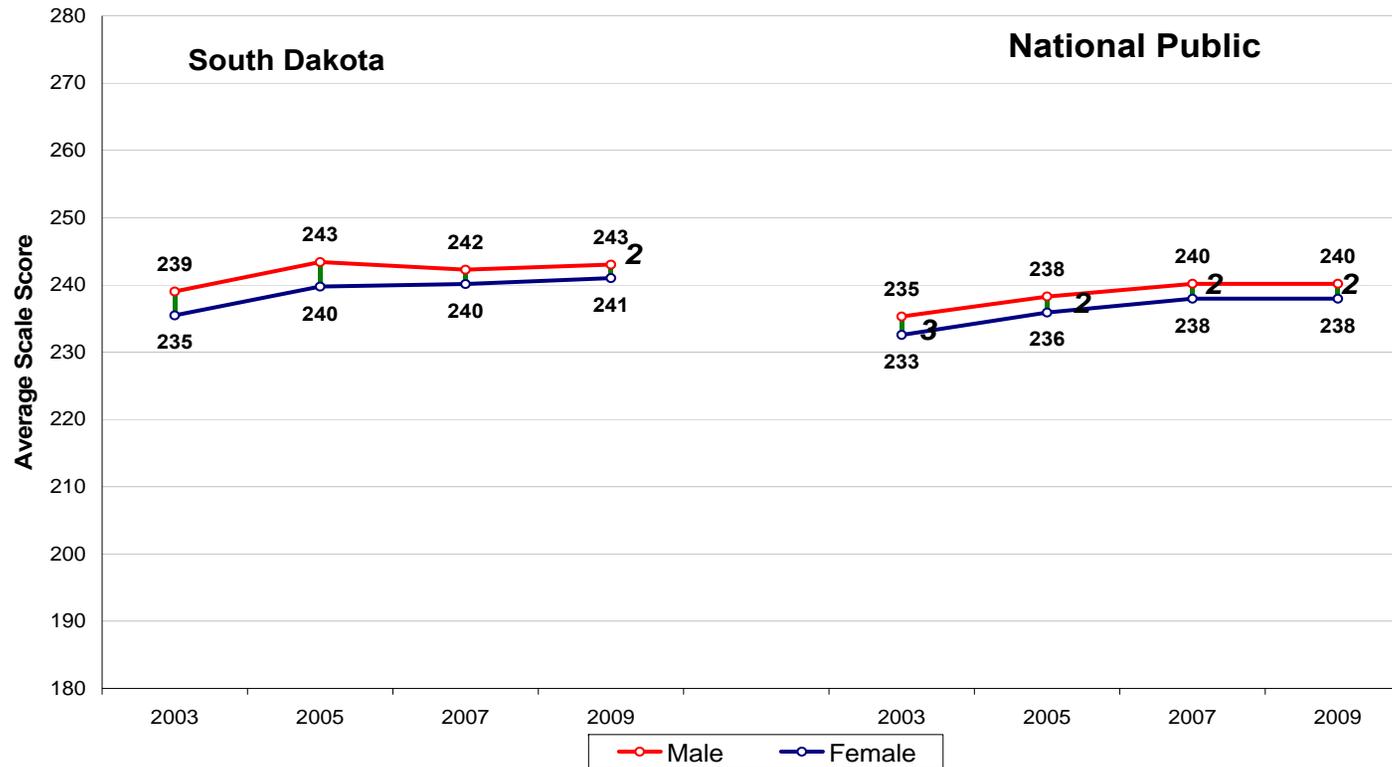
<sup>1</sup>Accommodations not permitted.

NOTE: Observed differences are not necessarily statistically significant.

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

# Do we have a gender gap in math?

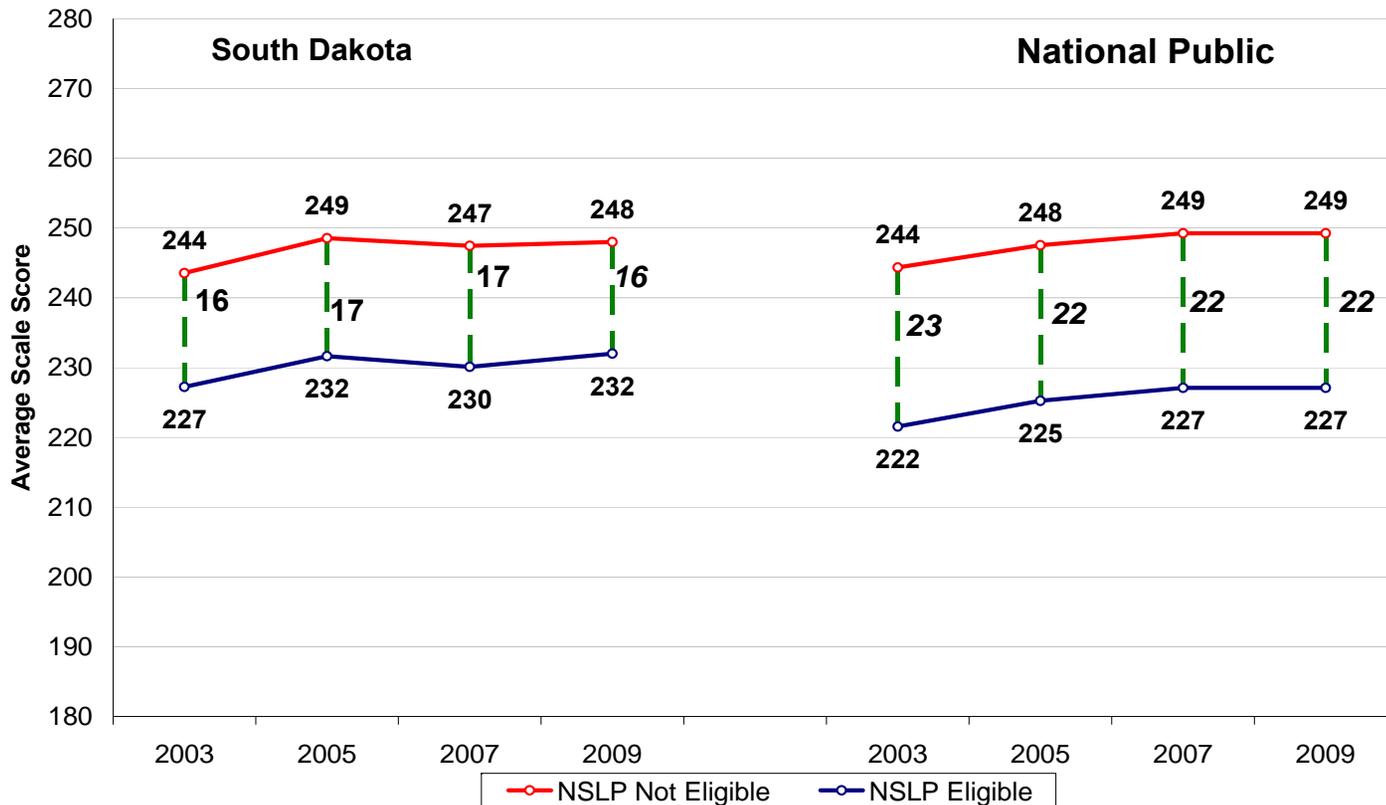
**NAEP Mathematics Grade 4 – Gender**  
*Gap - Average Scale Score: 2003-2009*



NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.  
 SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

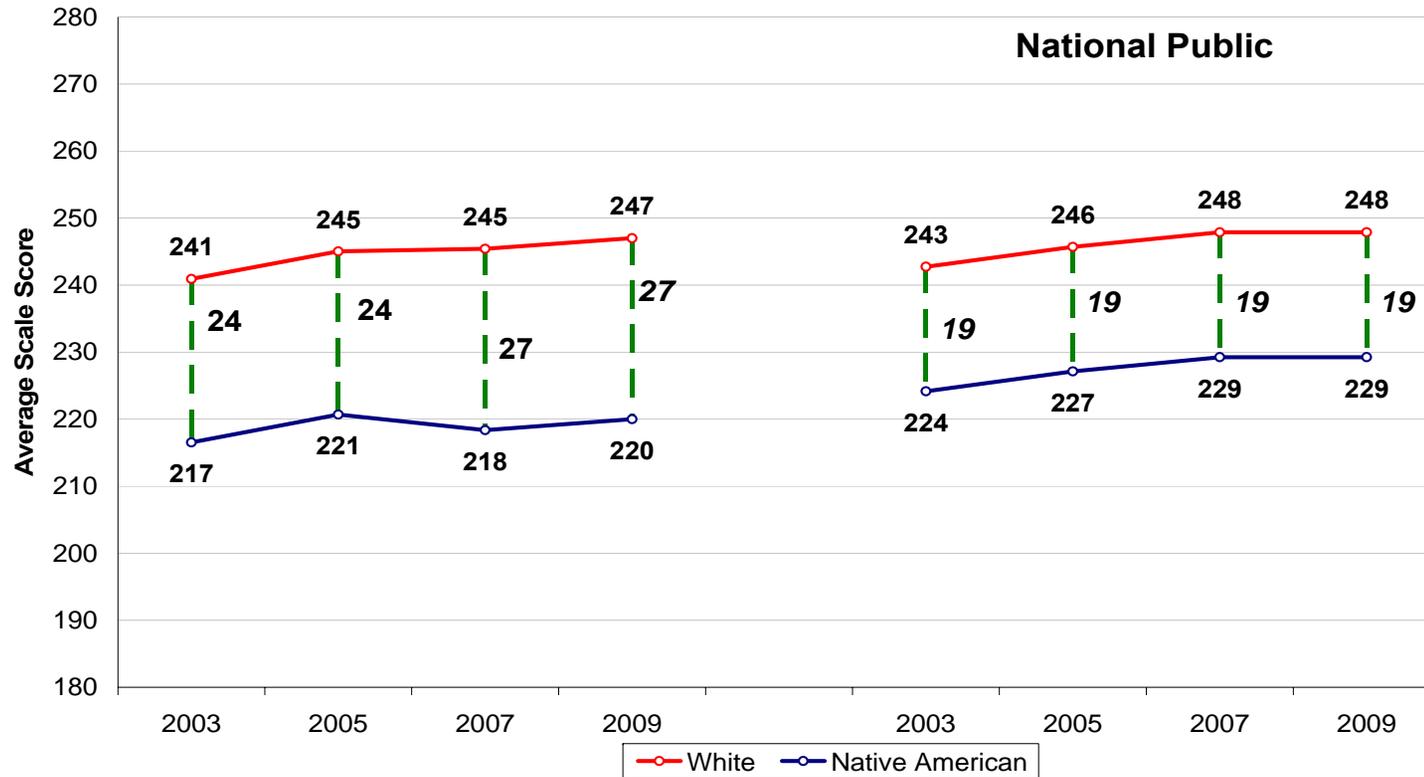
South Dakota's gap is significantly smaller than National Public's

**NAEP Mathematics Grade 4 – National School Lunch Program**  
*Gap - Average Scale Score: 2003-2009*



NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

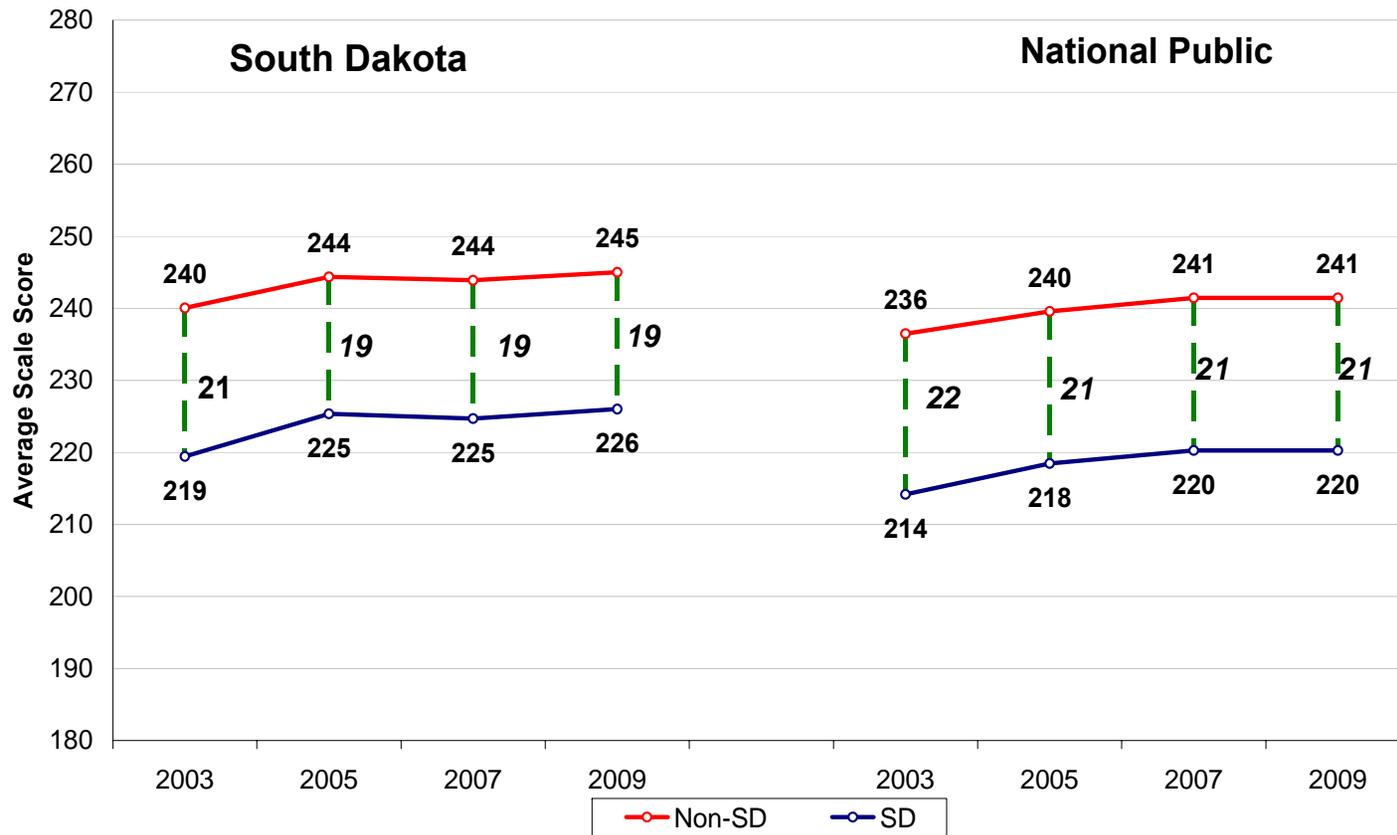
### NAEP Mathematics Grade 4 – White - Native American Gap - Average Scale Score: 2003-2009



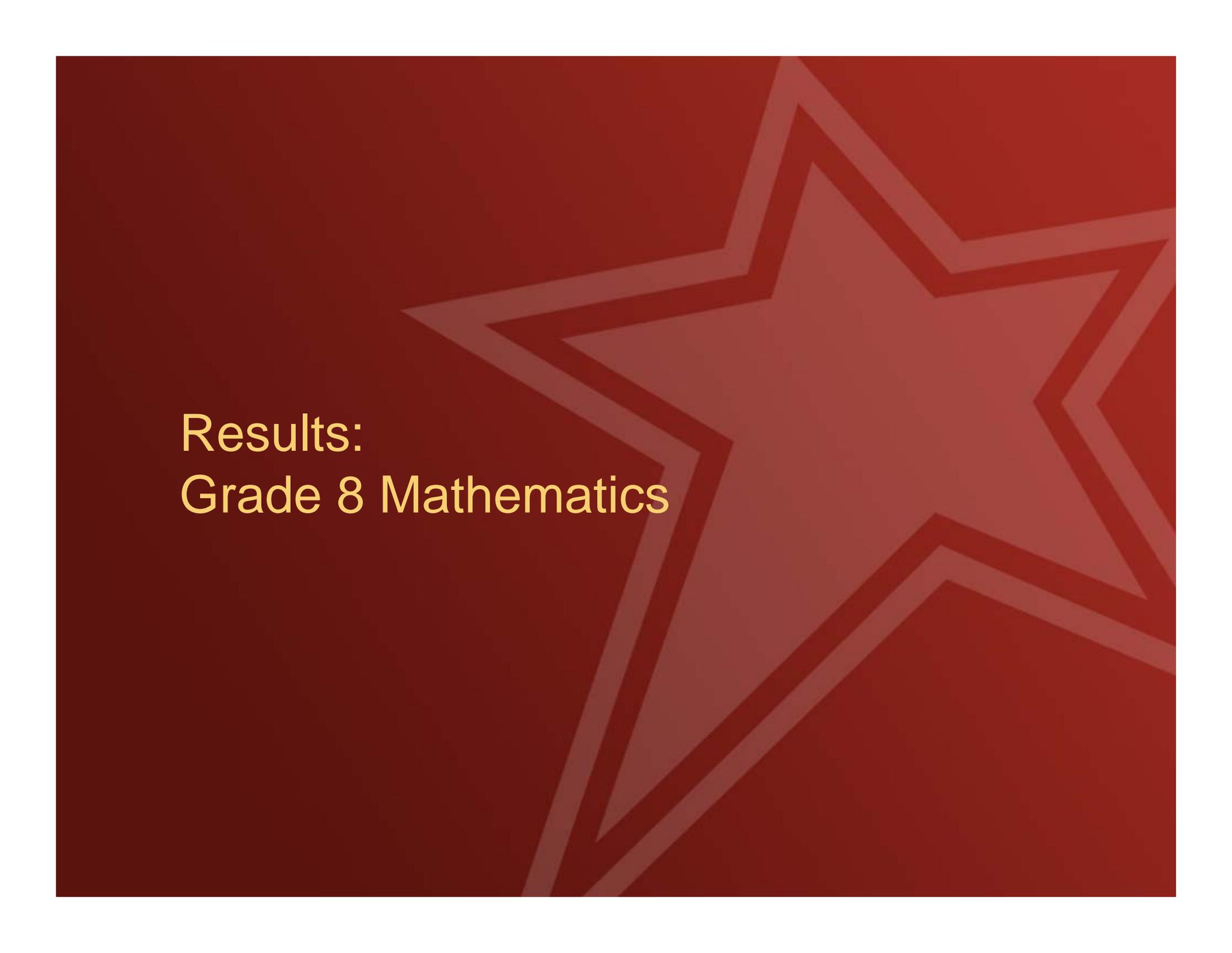
NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

# South Dakota's Gap for Students with Disabilities is smaller than the Nation's

**NAEP Mathematics Grade 4 – Students with Disabilities**  
*Gap - Average Scale Score: 2003-2009*

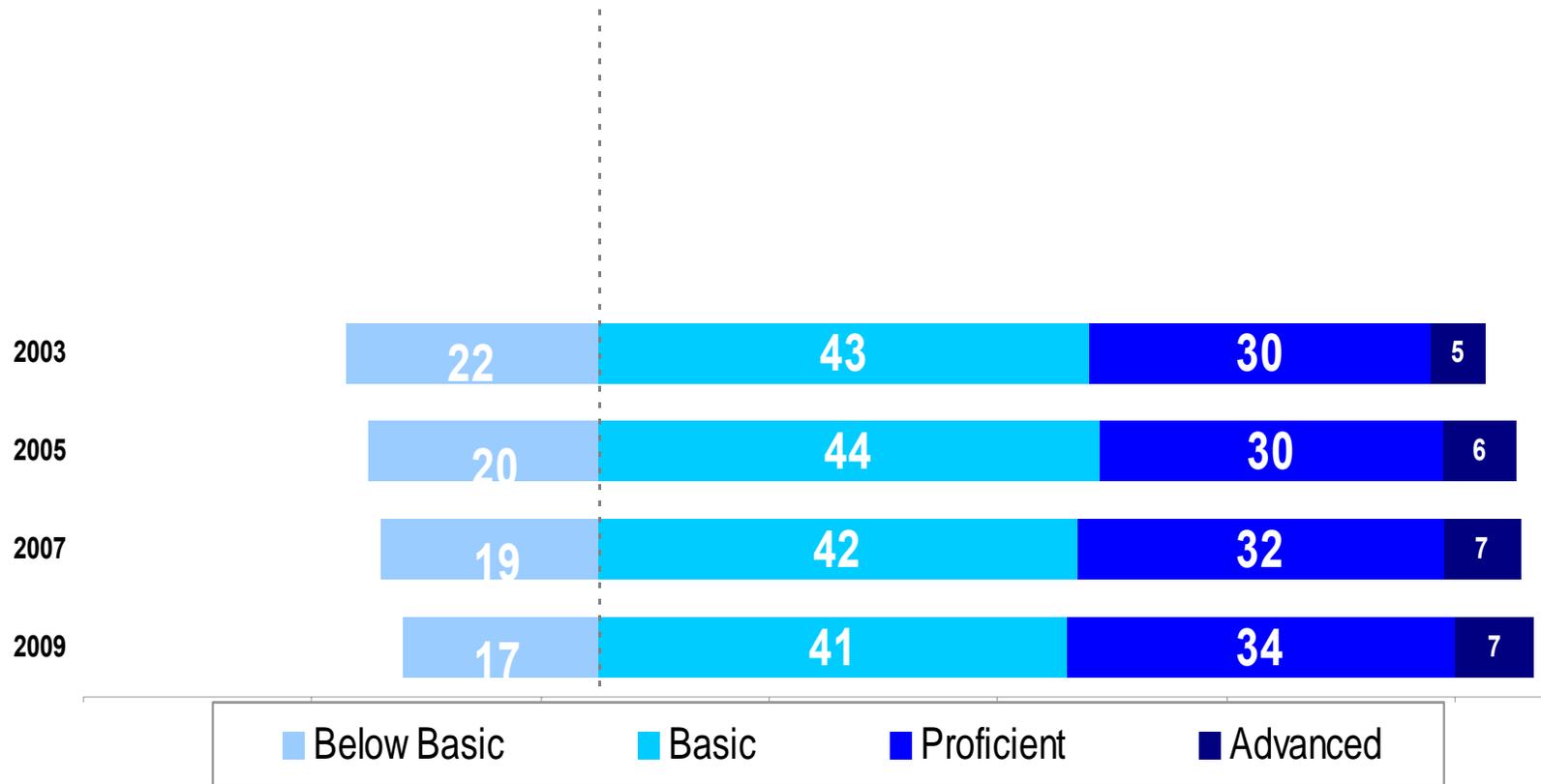


NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).



Results:  
Grade 8 Mathematics

### NAEP Mathematics Grade 8 – Overall *Achievement Level Percentage*



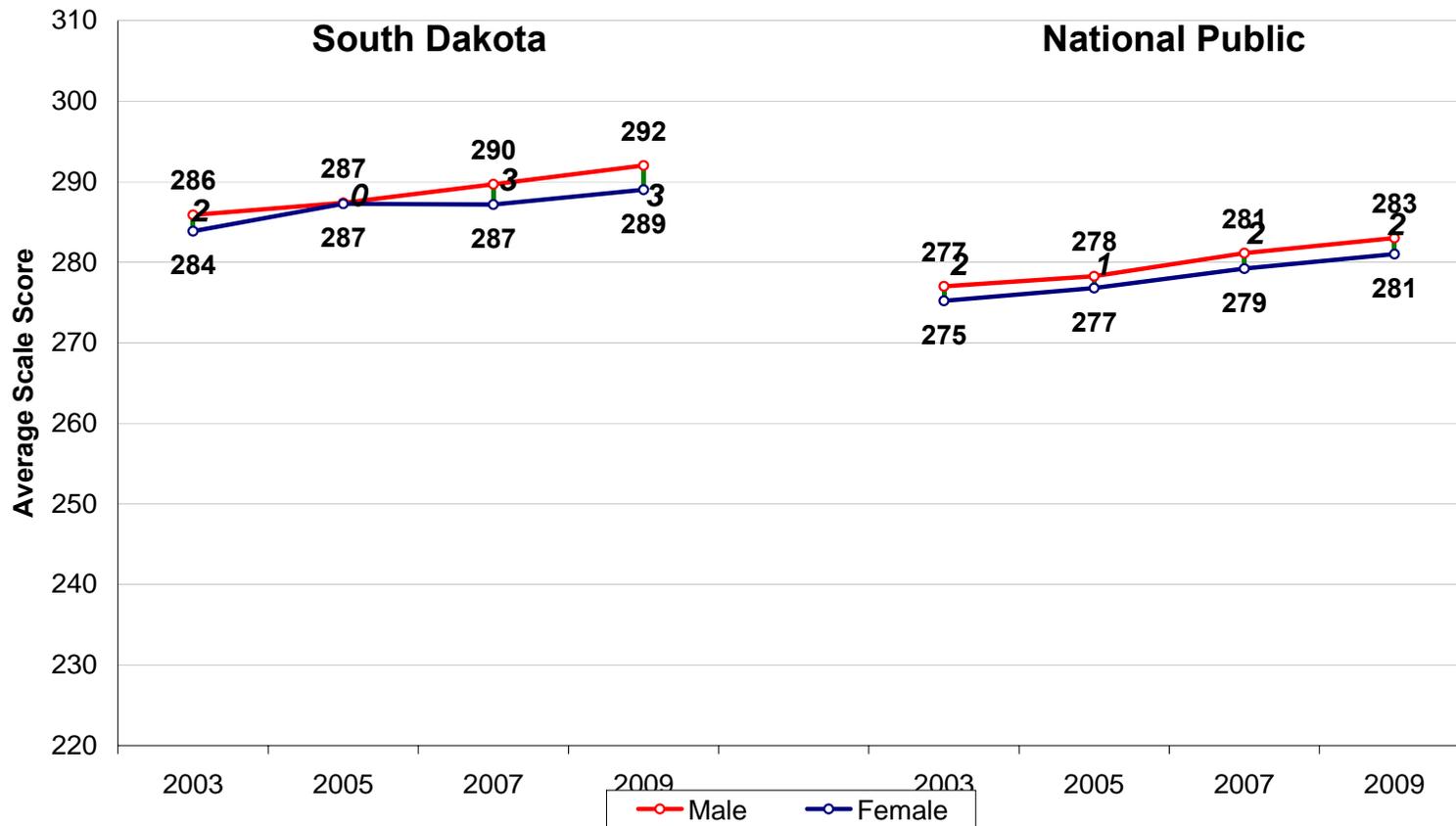
<sup>1</sup> Accommodations not permitted.

NOTE: Observed differences are not necessarily statistically significant.

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

# Is the gender gap growing?

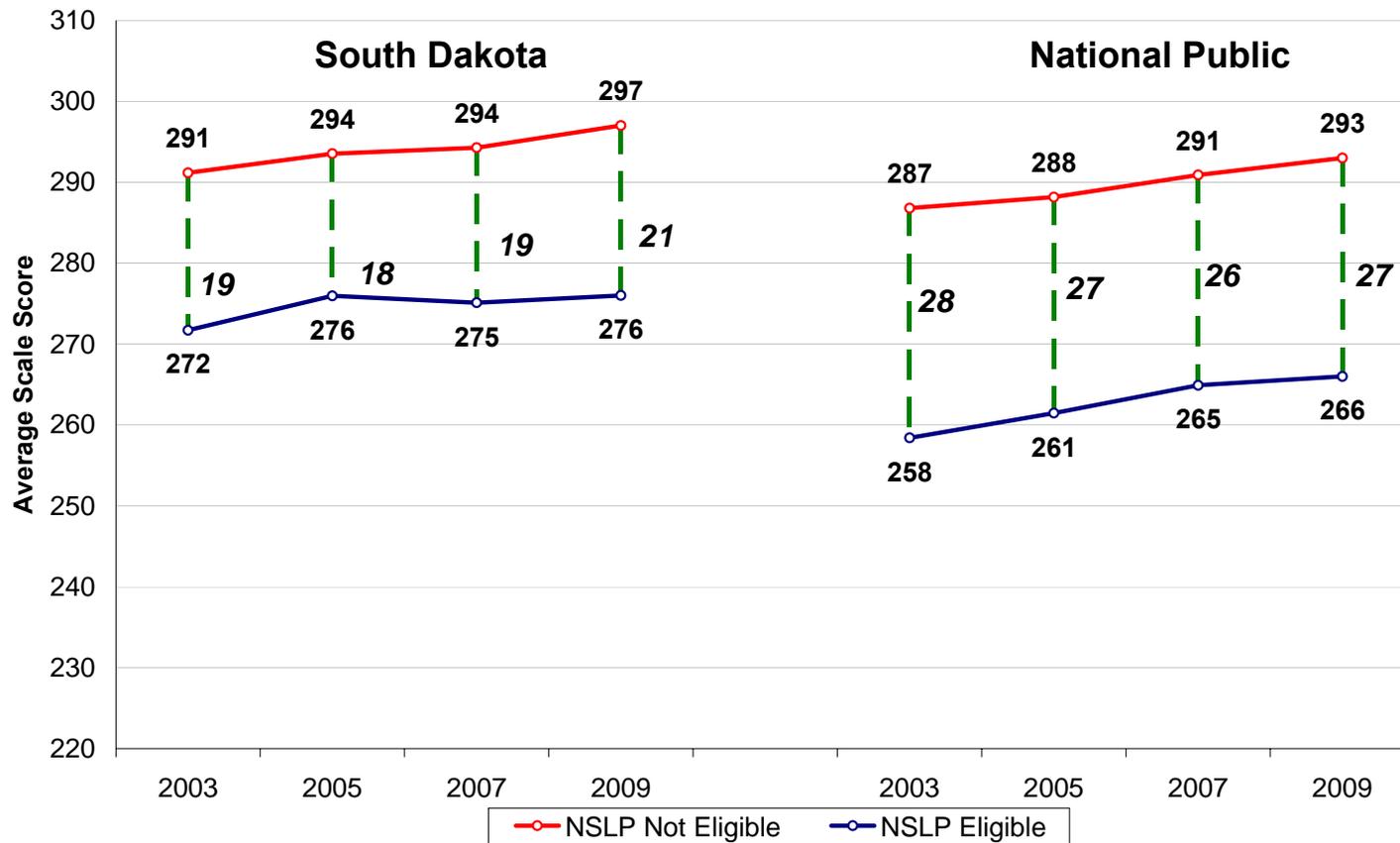
**NAEP Mathematics Grade 8 Gender**  
*Gap - Average Scale Score: 2003-2009*



NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

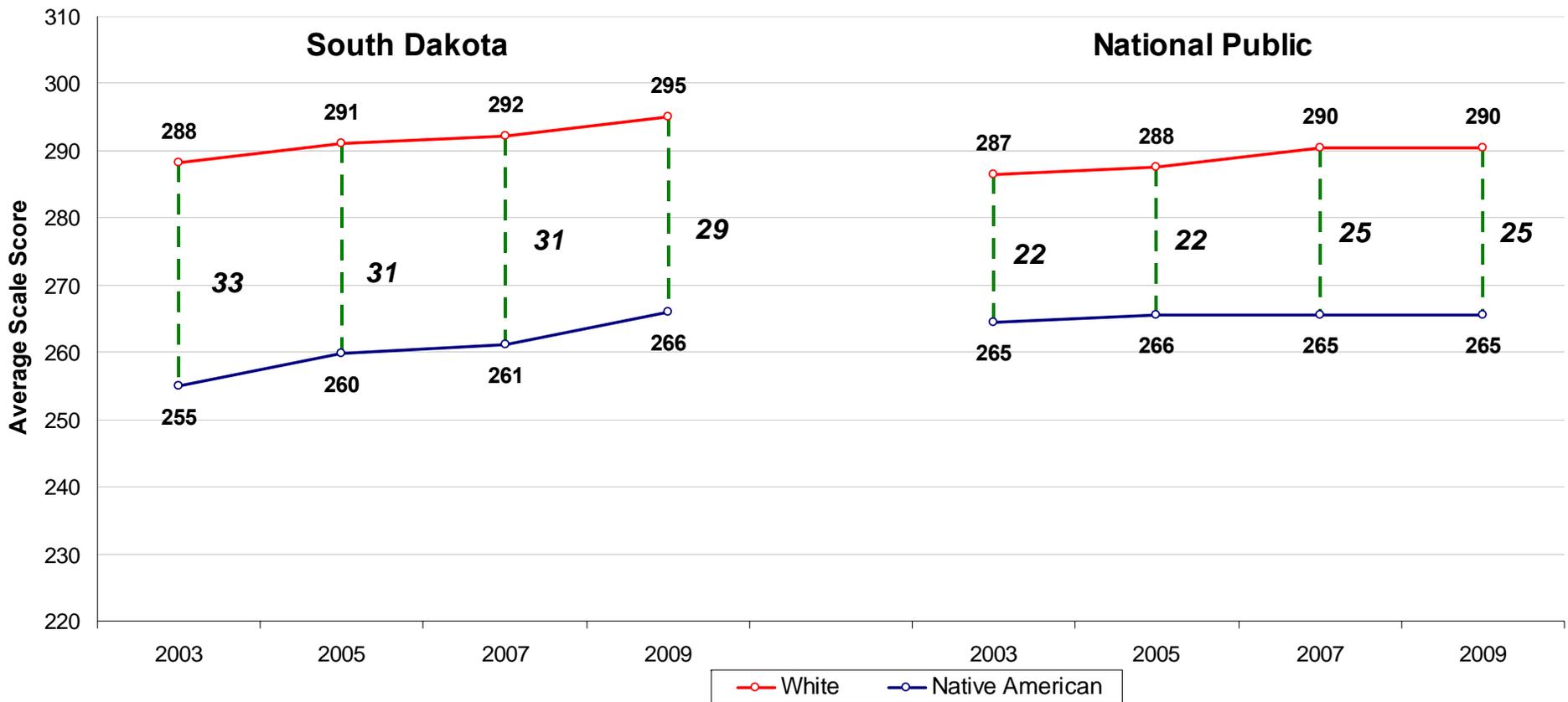
8<sup>th</sup> grade gap is significantly less than National Public

**NAEP Mathematics Grade 8 – National School Lunch Program**  
*Gap - Average Scale Score: 2003-2009*



NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

## NAEP Mathematics Grade 8 – White - Native American Gap - Average Scale Score: 2003-2009

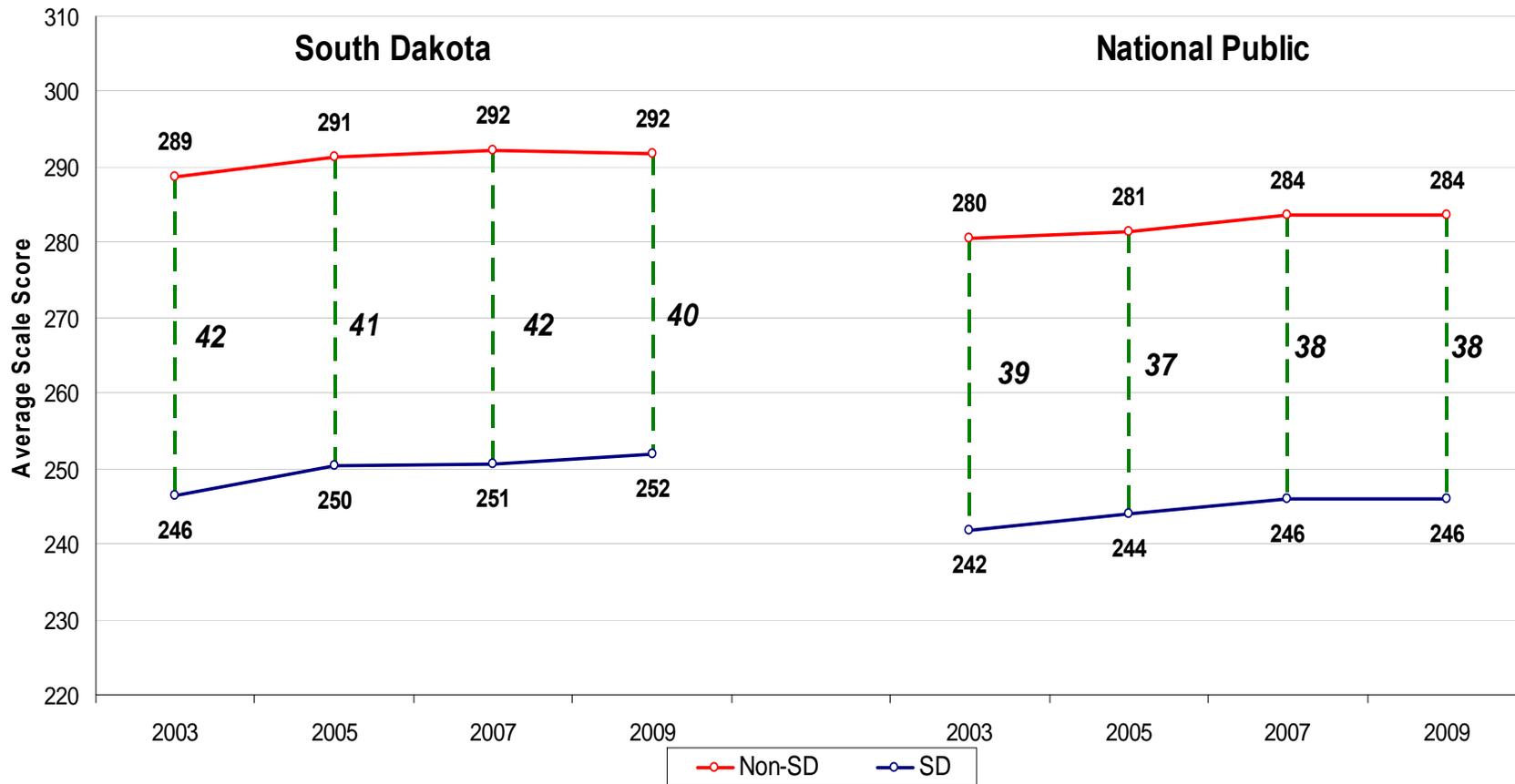


NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.

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

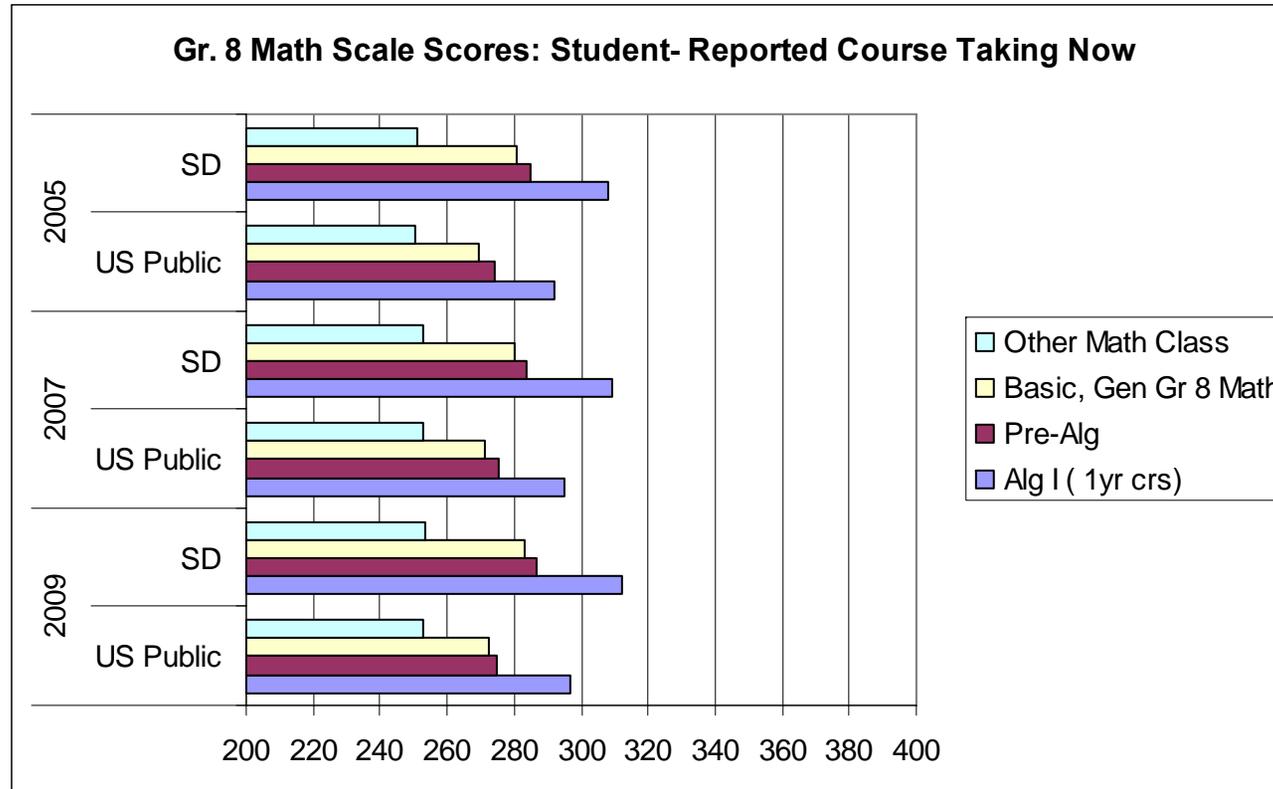
## NAEP Mathematics Grade 8 – Students with Disabilities

Gap - Average Scale Score: 2003-2009

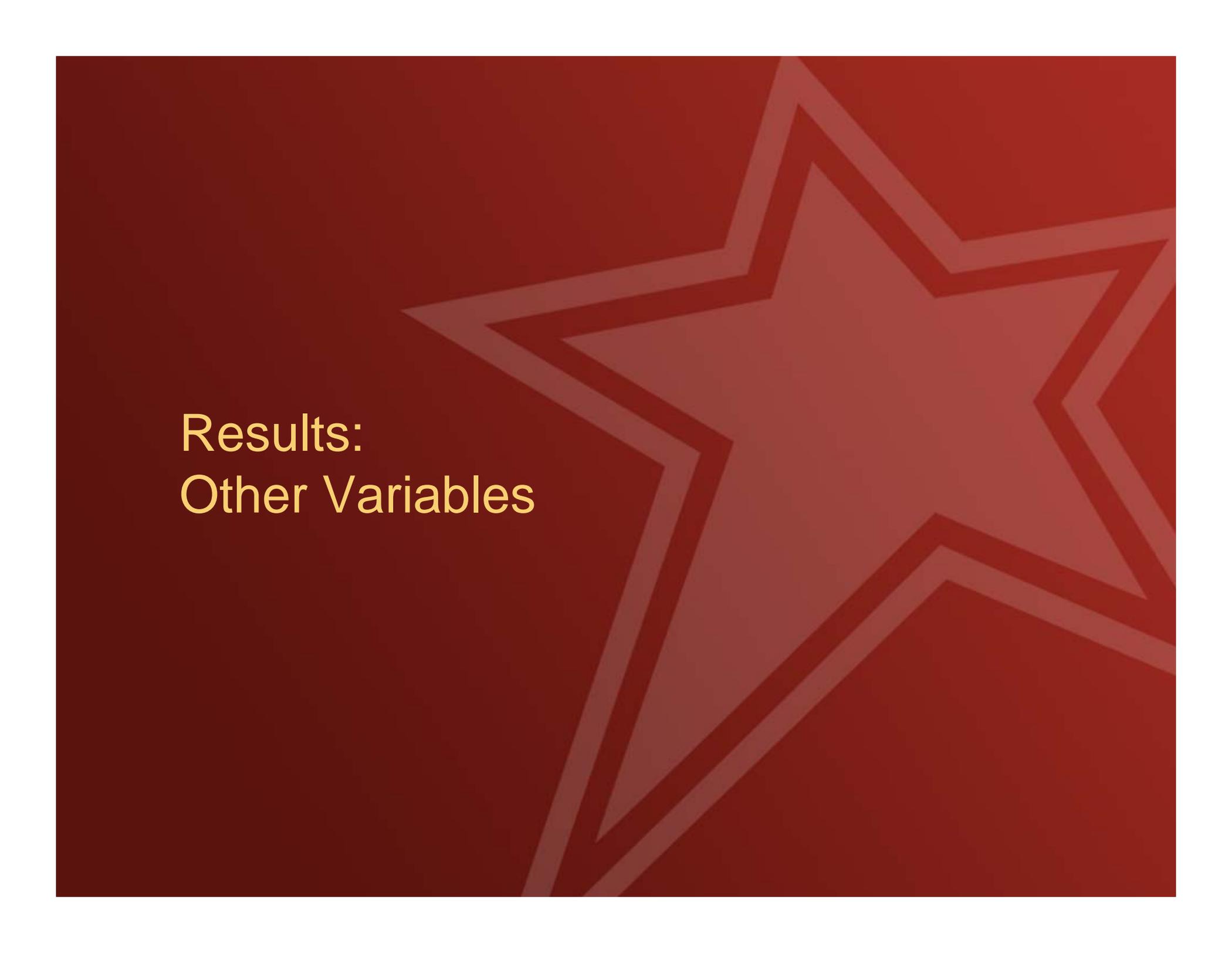


NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

## South Dakota students taking Algebra out score other students



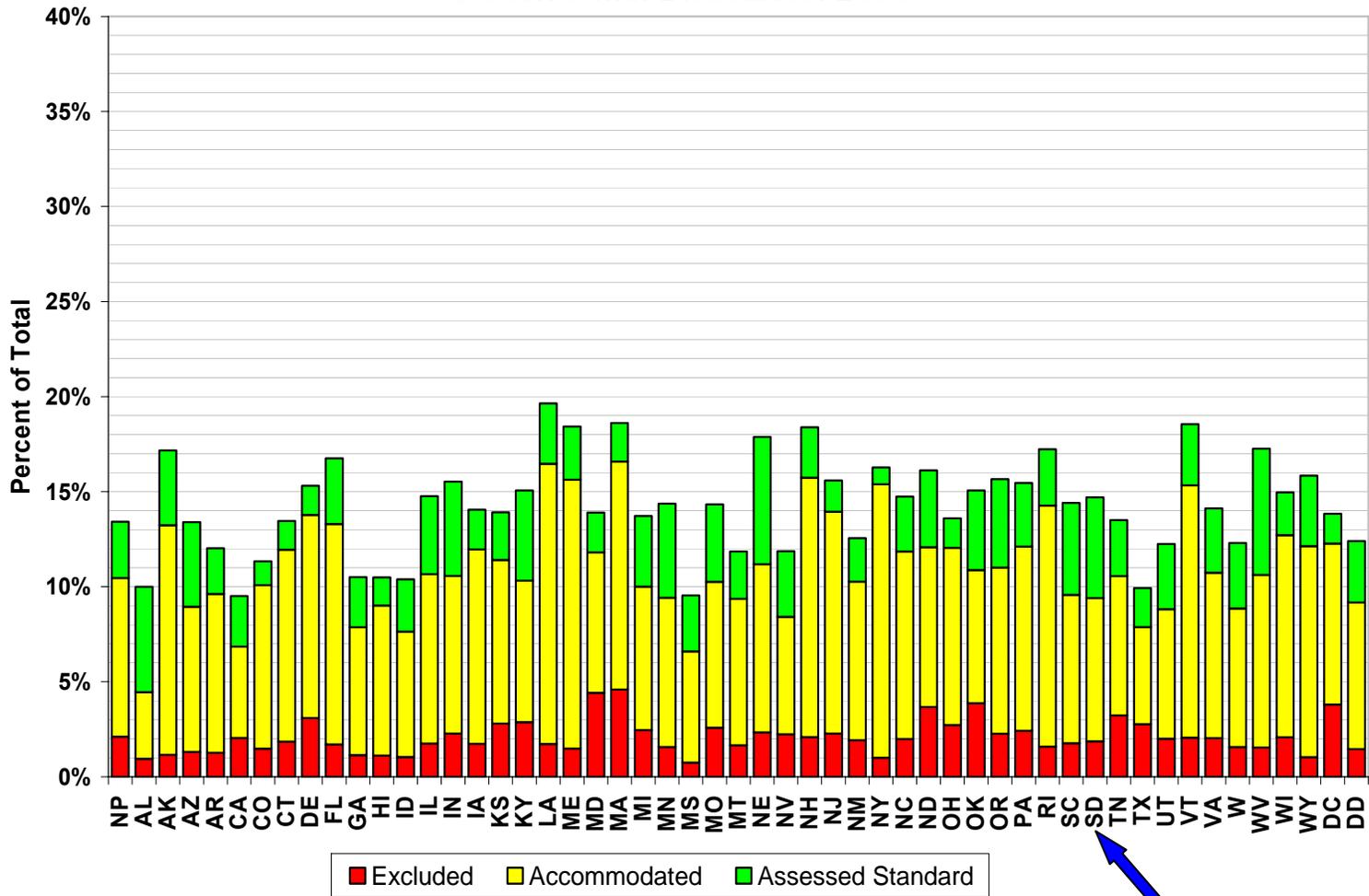
27% of South Dakota's 8<sup>th</sup> graders reported taking Alg. 1. Percent was similar for all other administrations. Nationally, 32% of the students reported taking Alg. 1 in 2009.



Results:  
Other Variables

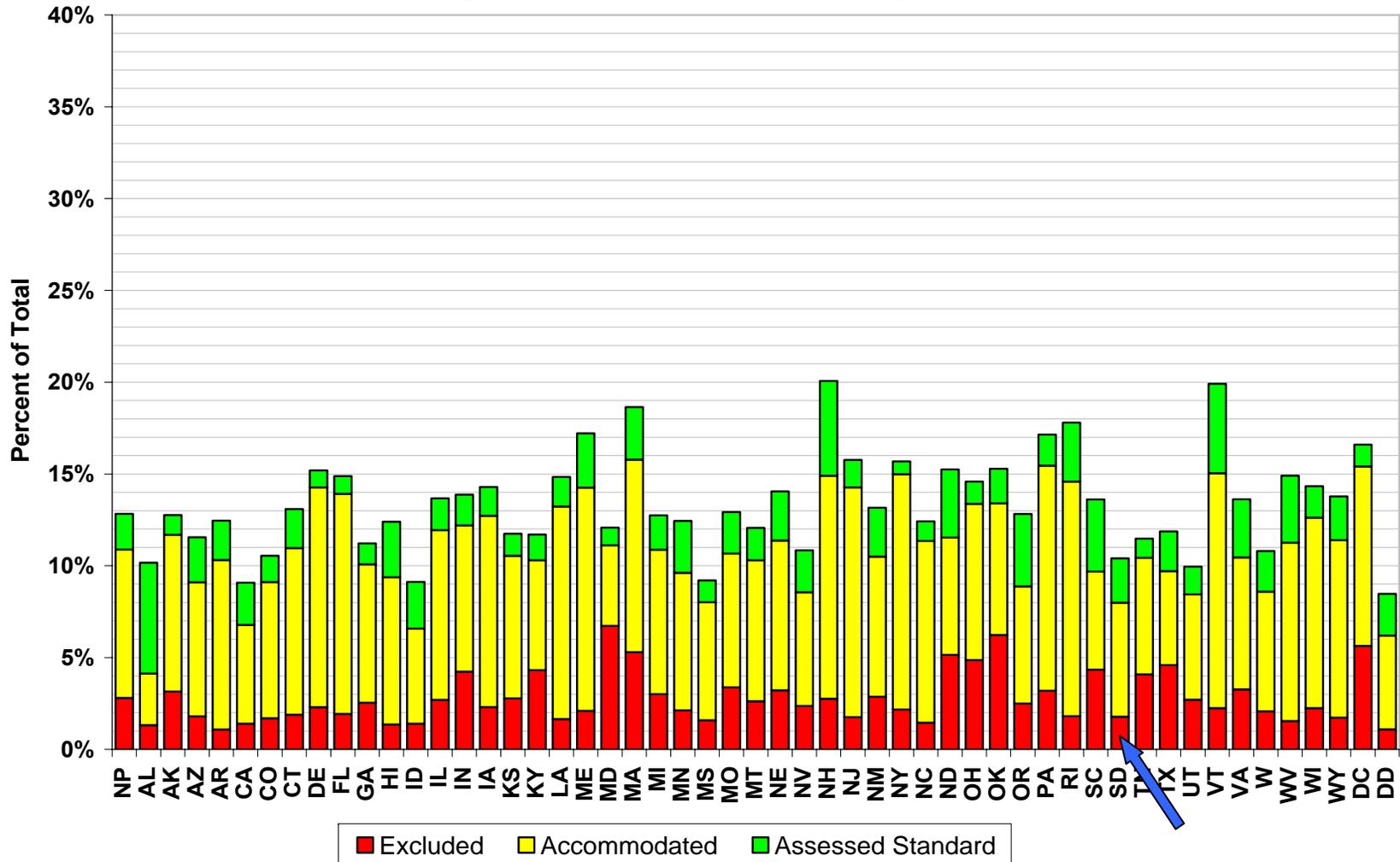
# How do our inclusion rates compare to the other states?

**NAEP Mathematics Grade 4**  
*Students with Disabilities: 2009*



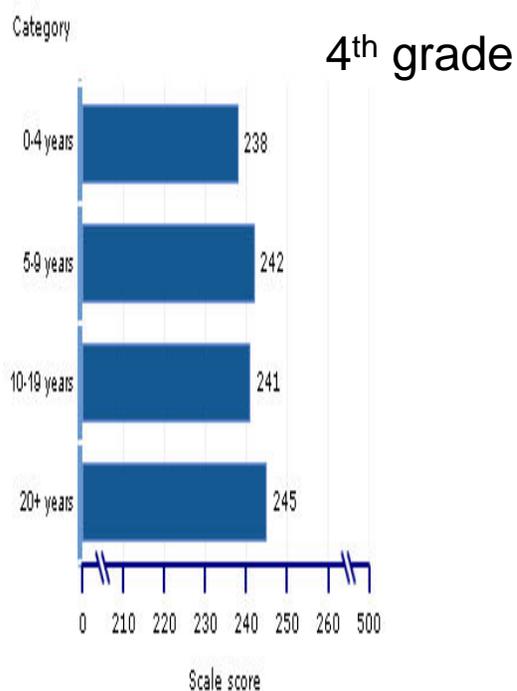
## NAEP Mathematics Grade 8

Students with Disabilities: 2009



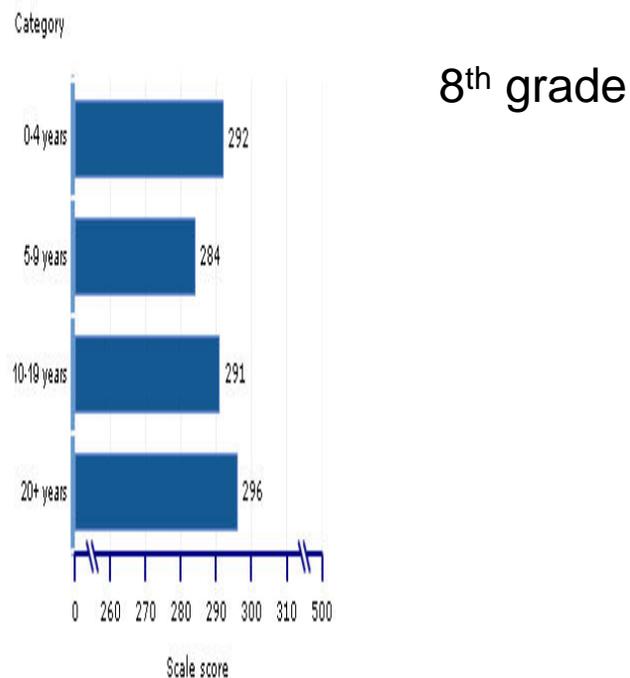
## Do experienced teachers make a difference in student achievement?

Average scale scores for mathematics, grade 4, by Years taught elementary or secondary [YRSEXP] for year and jurisdiction: 2009  
2009, South Dakota



NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 Mathematics Assessment.

Average scale scores for mathematics, grade 8, by Years taught math [YRSMATH] for year and jurisdiction: 2009  
2009, South Dakota



NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 Mathematics Assessment.