

NAEP 2013 Mathematics Grade 4

More states outperforming South Dakota

Math Grade 4 Highlights:

- In 2013, South Dakota's average scale score was **not significantly different** from the national average (241) on the NAEP 4th grade mathematics assessment.
- South Dakota's average scale score (241) was **higher** than 11 states but **lower** than 23 states and **not significantly different** from 15 states.
- 40% of South Dakota students scored **At or Above Proficient** in 2013, which is higher than 2003 (34%).
- More white students scored **At or Above Proficient** on NAEP in 2013 (48%) than in 2003 (38%).
- Only 12% of Native American students scored **At or Above Proficient** and 45% scored **Below Basic**.
- The achievement gap between white and Native American students in South Dakota (30 pts) was **larger** than the national average (22 pts).

What is NAEP?

The National Assessment of Educational Progress is administered in South Dakota public schools every other year and measures what students know and can do in math and reading. From January to March 2013, approximately 3,000 South Dakota 4th graders in two-thirds of elementary schools participated in NAEP in math. Student performance is reported as an average scale score on the NAEP math scale, which ranges from 0 to 500.

How did we do in 2013?

South Dakota's 4th grade math scores are higher than they were in 2003, but have remained flat since 2005. Overall, South Dakota scores are up four points in the last ten years. In that same time, the national average has risen seven points (**Figure 1**).

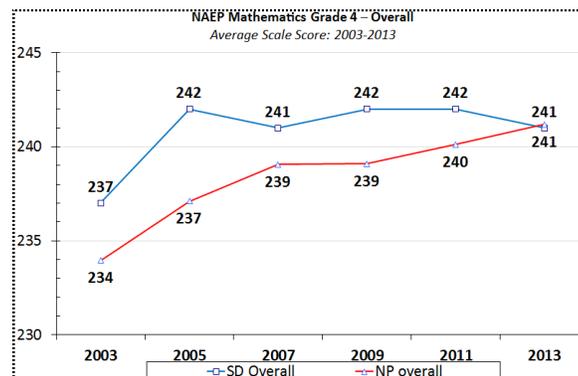


Figure 1: Average scale scores across time for South Dakota and the national public

Although South Dakota's average scale score has not fallen below the national average, our ranking compared to other states has fallen. In 2013, South Dakota scored higher than only 11 states, while in 2005 we scored higher than 27 states and lower than only five.

White students' average scale score of 247 was significantly higher than Hispanic students (226), black students (221) and Native American students (217). None of the racial/ethnic groups in the state increased achievement from 2011 to 2013.

The achievement gap for students identified as having a disability is the largest it has ever been. The gap in 2013 (25 points) is six points higher than it was in 2005 (19 points). The opposite is true for English language learners in South Dakota. For them, 2013's 29-point gap is the smallest it has ever been, and 10 points smaller than in 2005.

Students who were eligible for the National School Lunch Program, an indicator of family income, had an average scale score that was 20 points lower than students who were not eligible.

For more information, visit:

<http://doe.sd.gov/oats/NAEP.aspx>

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What is on the test?

Five different content areas:

- Number properties and operations
- Measurement
- Geometry
- Data analysis, statistics and probability
- Algebra

On the 4th grade mathematics assessment, questions are divided as follows: 40 percent number properties, 20 percent measurement, 15 percent each in geometry and algebra, and 10 percent data analysis. Testing time is split evenly between multiple choice and constructed response (both short and extended).

Can I see a multiple choice question?

Below is a number properties and operations item from the 2013 NAEP assessment:

$$\frac{2}{5} + \frac{3}{5} + \frac{4}{5} =$$

A. $\frac{7}{5}$ B. $\frac{8}{5}$ C. $\frac{9}{5}$ D. $\frac{9}{15}$

Forty-eight percent of South Dakota's 4th graders answered this question correctly (C). Forty-four percent of students in South Dakota chose option D.

Below is a geometry item:



Which statement is true about all four shapes shown?

- A. Each shape is a rectangle.
- B. Each shape is a quadrilateral.
- C. Each shape has two pairs of parallel sides.
- D. Each shape has one or more right angles.

Sixty-one percent of South Dakota students answered this question correctly (B).

Can I see a short answer question?

Below is an algebra item requiring an extended constructed response:

A yellow box holds 72 pencils.

$$\boxed{Y} \text{ is the same as } \boxed{72}.$$

Two red boxes hold as many pencils as 1 yellow box.

$$\boxed{R} \boxed{R} \text{ is the same as } \boxed{Y}.$$

Three blue boxes hold as many pencils as 1 red box.

$$\boxed{B} \boxed{B} \boxed{B} \text{ is the same as } \boxed{R}.$$

How many pencils does 1 blue box hold?

Answer: _____

Show or explain how you got your answer.

The correct explanation includes one of the following:

$$36 + 36 = 72 \quad (\text{or } 72 \div 2 = 36)$$

$$12 + 12 + 12 = 36 \quad (\text{or } 36 \div 3 = 12)$$

OR

If 3 blue boxes equal 1 red, then 6 blue boxes equal 2 red boxes.

$$72 \div 6 = 12$$

Constructed response items are graded using a rubric that focuses on the content of the answer, not spelling or grammar. Students can receive partial credit for responses.

Satisfactory

Answer of 12 with correct explanation

Partial

Answer of 12 with incomplete or no explanation, or explanation of, "I used a calculator"

Minimal

Answer of 18, 24 or 36 with supporting explanation

Incorrect

Answer of 18, 24 or 36 with incorrect or no explanation; other incorrect responses

Eighteen percent of South Dakota students' answers to this question were scored Satisfactory or Partial. Twelve percent of answers were scored Minimal and 63 percent were Incorrect.

Where can I get more information?

These sites offer NAEP data analysis:

- [NAEP Data Explorer](http://NAEP.Data Explorer)
- Nationsreportcard.gov

Released questions can be viewed and turned into classroom tests with the [NAEP Questions Tool](#).

Contact Alan Haarstad at Alan.Haarstad@state.sd.us with questions about NAEP or these online tools.

Released NAEP items, as well as other state and teacher developed assessment resources, can also be found on the [South Dakota Assessment Portal](#).

For more information on the South Dakota Assessment Portal, contact Matt Gill at Matthew.Gill@state.sd.us