College- and Career-Ready Assessments

South Carolina
SC READY

Mathematics
Grades 3 through 5

Test Data Review Report 2023

Updated 1/30/2024

Introduction

On October 23, 2023, Data Recognition Corporation (DRC) and the South Carolina Department of Education (SCDE) Office of Assessment and Standards (OAS) convened a panel of educators to review item data from the SC READY assessment of the 2015 South Carolina College- and Career-Ready Math Standards. The panel discussed and analyzed items from the 2023 assessment, including information about how students performed on each item. The panel recognizes the hard work of South Carolina educators and offers these relevant and useful suggestions for improving instruction as an addendum to those from previous years.

General Observations and Comments

- Use manipulatives during instruction; ask students to create models to make math more meaningful and to build understanding.
- Algorithms (when indicated) and procedures should continue to be taught, but teachers should focus on reasoning and justification of the math.
- Mathematic academic vocabulary should be emphasized, including vocabulary introduced in previous years.
- Students should be able to explain their thinking through writing or drawing.
- Vertical planning may be a useful strategy to help teachers understand where students are coming from and where they are headed; it may also help build consistency of models, manipulatives, vocabulary, etc.

Grade 3

Number Sense and Base Ten

- Ensure that students have mastered basic multiplication facts.
- Incorporate real-world word problems into instruction of addition. Ask students to match expressions first before solving them.
- Provide more practice writing expanded form when zeros are present in standard form; provide problems with a missing place value.
- Use manipulatives to help teach multiplication by multiples of 10. Teach place value strategies rather than teaching to “add 0.”
- When teaching comparisons, use correct terminology and ensure students understand it. Ensure students know how to read comparisons symbols (e.g., “is greater than,” “is less than”).
- Present questions in multiple ways, not just computational problems.

Number Sense – Fractions

- Use manipulatives when introducing fractions and to reinforce the concept of equivalent fractions.
- Teach students to draw their own fraction models. Match fractions to concrete models so students can see what they represent and how they compare with other fractions.
- Provide opportunities to work with fractions that are greater than one and ask them to place those numbers on a number line. Ensure that students know how to determine the denominator when reading or plotting fractions on a number line.
- Practice comparing fractions with the same denominator or the same numerator. Encourage students to create rules or look for patterns.
- Help students to understand that fractions are division problems.

Algebraic Thinking and Operations

- Teach the commutative property. Help students to understand that the commutative property does not yield the same array but the same product (i.e., rows and columns are flipped).
- Practice family traits of multiplication facts, especially with missing variables in word problem form.
- Ask students to draw models or arrays for real-world problems when no model is provided. Practice describing an array based on a word problem.
- Teach inverse operations concurrently; use fact families to help reinforce the concept.
- Teach the distributive property and help students understand how it can be useful.

Geometry

- Emphasize that quadrilaterals can be any 4-sided shape; provide examples of non-traditional quadrilaterals.
- Practice classifications and use Venn diagrams to help students see that shapes can fall into more than one category.
- Provide hands-on opportunities for students to build 3D shapes from nets and to break apart 3D shapes to build nets.
- Connect geometric terms to real-life examples (e.g., “find a right angle in the classroom”).

Measurement and Data Analysis

- When teaching picture graphs, have students think about appropriate ways of measuring each picture.
- Provide practice with line plots in different contexts.

- Ensure that students understand the purpose of the key in a graph and know how to apply it.
- Use number lines to help students visualize and compute elapsed time.

Grade 4

Number Sense and Base Ten

- Provide practice with rounding numbers for all place values; the concept of "backward rounding" was difficult for students (i.e., asking which number rounds to a given number). Ask students the minimum and maximum numbers that would round to a given number.
- Use concrete models to help students understand new multiplication and division problems.
- Continue to use word problems and real-world context; ensure students can determine the correct operation to use in multiplication and division word problems.
- Provide practice with numbers that include zero; ensure students know that zero is a placeholder.
- Teach threshold numbers when working on place value (e.g., 9,999 + 1).

Number Sense and Operations – Fractions

- Teach decimal/fraction equivalency and help students understand all the ways a value could be written (e.g., 0.3 = 0.30 = 3/10). Ask students to partition fractions to help teach equivalency.
- Use word problems and provide real-world examples to help teach multiplying fractions.
- Model multiplication of a whole number and a fraction as an addition and multiplication problem.
- Use number lines to compare and order fractions.
- Teach what numbers can mean relative to the context (e.g., in a race, a smaller number for time is better than a larger number).

Algebraic Thinking and Operations

- Provide examples and practice with real-world word problems, especially those that require multiple steps. Practice matching expressions and equations with real-world problems. Ask students to write the equation they would use to solve a real-world problem instead of actually solving it.
- Provide ample practice breaking whole numbers into factors and comparing factors between two numbers.
- Use examples of patterns with multiple parts and include numeric patterns as well as visual ones.

- Provide examples of number lines where not every number is labeled.
- Teach students to draw arrays for solving problems describing “rows” or “columns.”

Geometry

- Ensure students are comfortable with vocabulary and that they know the characteristics of each shape.
- Provide practice to help students visualize where lines or points might be placed within a figure.

Measurement and Data Analysis

- Allow students to practice using protractors to measure angles; focus on the direction of the angle and finding “0” before developing the angle measure. Be intentional in relating circles to angle measures.
- Use real-world examples to teach conversions, especially metric conversions; help students to visualize conversions before teaching the math behind them.
- Provide area and perimeter problems describing a shape without providing the shape.
- Practice strategies for calculating elapsed time, especially when crossing the top of the hour.
- Ensure line plots include fractional parts. Use number lines to help with the concept of subtracting time.

Grade 5

Number Sense and Base Ten

- Reinforce place value; help students understand the relative value of digits in each place.
- Teach the distributive property intentionally. Students should understand why and when to use the distributive property.
- Teach students expanded form notation with decimals to increase success with standard 5.NSBT.1.
- Provide practice matching equivalent expressions.

Number Sense and Operations – Fractions

- Ensure students know they need to find a common denominator when adding and subtracting fractions.
- Be intentional in asking students to explain their thinking and reasoning.
- Practice dividing unit fractions by whole numbers and whole numbers by unit fractions.

- Reinforce the concept that a fraction is a division problem.
- Ensure students have opportunities to practice with division problems that include fractions.
- Ask students to practice writing equations in words to build understanding.

Algebraic Thinking and Operations

- Use a variety of examples for teaching grouping symbols in equations. Emphasize working from the inside to the outside.
- Practice putting equations into verbal statements and vice versa.
- Ensure students practice creating and identifying patterns; ask students to continue a pattern or to compare two different patterns; practice patterns using a coordinate grid.
- Present charts in different formats (e.g., vertically and horizontally).

Geometry

- Practice word problems with coordinates; ensure that students understand graphs and what the coordinates mean.
- Provide opportunities for students to visualize a graph or to create one themselves to solve a problem.
- Ensure that students know coordinate plane terminology.
- Ask students to relate ordered pairs to a set of given information; allow them to practice recognizing increases and decreases and using data to make decisions.

Measurement and Data Analysis

- Manipulatives may be used to help reinforce line plots.
- Ask students to develop multi-step problems using information found in line plots, beyond asking them to interpret the information.
- Provide opportunities for students to practice analyzing line plots.
- Use real-world examples and context to teach conversions; ensure students can convert metric measurements in a variety of ways.