



SC READY

Mathematics Grades 6 through 8

2024 Data Review Report

Data Recognition Corporation and the South Carolina Department of Education Office of Assessment and Standards (OAS) convened a panel of experts to review item data from the SC READY assessment of the 2015 South Carolina College- and Career-Ready Math Standards. The panel of experts discussed and analyzed items from the 2024 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

- Students need more practice and instruction to build number sense. Encourage students to interpret, not just calculate.
- Build stamina for working through test questions. SC READY questions often require more than a single step and test deeper understanding than what is usually provided in a textbook. Students should practice working through multi-step problems and checking their answers.
- Focus on interpreting data. Students can often apply a formula or an algorithm, but have more difficulty explaining their reasoning or demonstrating conceptual understanding. SC READY questions tend to focus more on interpretation than on calculations.

Grade 6

Number System

- Practice comparing numbers using absolute value, including fractions. Ensure students know absolute value notation.
- Students are having trouble comparing positive rational numbers in the form of fractions and decimals. Have students explain what fractions and decimals represent. Continue to use models where appropriate.
- Compare values using symbols and words, using a variety of number forms (e.g., decimals, fractions, variables representing numbers).
- Ensure students are comfortable with vocabulary around numbers (e.g., fractions vs. decimals, LCM, GCF).
- Include items where absolute value is one of the steps in evaluating an expression.
- Provide opportunities for students to build up their mathematical stamina for solving more complex math items.

Ratios and Proportional Relationships

- Practice looking for patterns in tables. Students should be able to interpret the numbers in a table and compare patterns in two tables.
- Ensure students can interpret a table of ratios and know how to identify or calculate equivalent ratios. Extend this practice to compare two tables and look for patterns in each table to compare.
- Remind students that all the ordered pairs in a ratio table are in the same ratio. The unit rate of the first ordered pair must carry out through the entire table.
- Use example problems where units shift within the problem (e.g., minutes to hours). Students should be flexible in their understanding of rates and be able to express a solution in different units.
- Give students the opportunity to experience items with non-traditional unit rates. For instance, find the minutes per mile or gallons per mile, etc.

Expressions, Equations, and Inequalities

- Ask students to find the “hidden operations” in math problems when operators aren’t written. For example, students should understand that there is multiplication between variables and coefficients and when there is a number in front of parentheses. Likewise, students should see fractions as “unfinished” division problems.
- Show examples of problems with variables on either side of the equation or inequality.
- Practice decimal and fraction multiplication problems both with and without a calculator.
- Use error analysis problems to help students get comfortable evaluating numerical expressions by identifying mistakes. Using card sorts for evaluating numerical expressions was also suggested.
- Reinforce vocabulary by focusing on what numbers mean in the context of a problem. For example, students should pay attention to the language of the problem to determine which variables are dependent and independent. Students should get practice understanding the context of a problem, not just evaluating a given expression.
- Students should see rational numbers in almost every expression at this grade. Students thought that $\frac{x}{2}$ had a coefficient of 2. Students are also having trouble distinguishing coefficients and constants.

- Even when all parts of an expression, equation, or inequality are defined in the item keep asking students what each part means in the context of the item. Connect tables to equations to graphs and to verbal expressions while asking what each part means and how they connect between representations.
- Students should be familiar with items where the question may be, “which of these expressions has a value of 48?” Then students should select from a given set of expressions. Another idea was to use a matching game where there is a list of expressions and a list of results where each result is used only once.

Geometry and Measurement

- Practice identifying triangles as parts of larger shapes (composite figures). Ask students to find shapes within shapes.
- Use error analysis items to get students comfortable with measurements (e.g., “I think the area of this shape is _____. What went wrong?”)
- Ask students to determine what they know about a shape and what they don’t know. Use known information to find the unknowns.
- When finding area of composite shapes, have students find missing side lengths using the given lengths to find the requested area. Discourage students from jumping directly to the formulas.
- Practice 3-dimensional shapes both with and without pictures. Have students find volume from a verbal description. Discuss volume as base area (B) times the height (h).
- Students should practice finding surface area in a real-world problem that provides only a verbal description.

Data Analysis and Statistics

- Use card sorting to familiarize students with vocabulary, including different types of graphs.
- Students are asked to explain what median and range mean. Students should know which measure summarizes the data the best given a graph.
- Ensure students can perform the calculations required for the DS standards and can explain how those calculations relate to the original data set. What does the mean tell us? Why is the mean different from the mode? What do mean and median tell us vs interquartile range and mean absolute deviation?
- Provide more opportunities for students to interpret graphs, not just create them. Connect vocabulary to data displays and allow students to ask and answer questions about what a graph is showing them.

- Students need to know how to interpret, understand, and connect the vocabulary of data analysis to the graphs. Spend time interpreting measures as well as calculating them.

Grade 7

Number System

- Use number lines to promote conceptual understanding and number sense. Use rational numbers, not just whole numbers.
- Expose students to items that require students to deal with a scenario or where the situation is described in words.
- Ask open-ended questions to help students see how numbers relate to each other. E.g., “What number could make this statement true?” or “I want a negative answer, what numbers might work?”
- Use manipulative (e.g., algebra tiles) to build number sense.
- Promote deeper understanding of how numbers relate to one another rather than relying on algorithms.

Ratios and Proportional Relationships

- Use fractions or rational numbers throughout instruction—students should learn not to fear fractions. Students should see fractions, decimals, and negative numbers in many different contexts, not just when teaching those specific standards.
- Practice talking through solutions to problems, even with multiple-choice questions. (“Does my answer make sense?” “Why do the other options not make sense?”) Ask students to make connections between representations of context-based problems.

Expressions, Equations, and Inequalities

- Practice fractions and decimals both with and without a calculator. Don’t rely only on examples with positive, “friendly” numbers. Distributing a fraction was problematic for students and needs to be practiced with and without a calculator.
- Use multi-layered, context-based problems to ensure students can persevere when given complex scenarios. Ensure students see situations with expressions not just simplification of given equations. Use items that add context, creation of expressions, or finding equivalence.
- Practice writing inequalities from a given situation, not just solving or choosing a number on a number line. Ensure students understand vocabulary (e.g., “at most,” “at least”) in real-world contexts.

- Ensure students are comfortable comparing numbers, including numbers with exponents.

Geometry and Measurement

- Compare the relationship between different parts of two different circles (e.g., circumference, diameter, radius) rather than using only a single circle to teach these concepts.
- Ensure students have a conceptual understanding of geometry standards. Students should be able to explain their reasoning, not just apply a formula.
- Explore how formulas for circles are derived—not just how to apply them—to promote deeper understanding.
- Include rational numbers when solving angle relationship items. Find ways to incorporate fractions, decimals, and negative numbers in standards outside of the standards that cover rational numbers.
- Include solving grade-level appropriate equations when finding missing angles rather than just having one angle labeled “x.”

Data Analysis, Statistics, and Probability

- Connect probabilities with modeling. Use manipulatives (e.g., spinners, dice) to collect data and track results before using more abstract descriptions.
- Use mathematical vocabulary and connect it to real-world situations.
- Encourage students to think about different ways of answering a question using number sense. E.g., “This is what I know, how can I get what I need to know?”
- Use interactive journals that students have access to and can refer to.
- Use rotations or stations to keep materials fresh. Students should continue to see probabilities, fractions, etc., even after they are taught.
- Analyze graphs for what they can tell us. Box-and-whisker plots can show the median, but not the mean. What graph should they use given the data or the situation?
- Students are not grasping 7.DSP.8a. Keep coming back to the basics about probability to reinforce the aspect of probability that are foundational.

Grade 8

Number System

- Ask students to create their own Venn diagram of numbers and then come up with numbers to fill in each group.

- Reinforce number sense and build vocabulary throughout instruction. Discuss prime numbers and how they are different from composite numbers. There is a major deficit in the understanding of numbers. Use the vocabulary from the standards in everyday instruction.

Functions

- Incorporate vocabulary activities to expose students to important terms (e.g., range, domain, independent, dependent, decreasing, linear, non-linear). Discuss similarities and differences and talk about why some terms are used more often than others.
- Use card sort or matching activities to show multiple representations of functions.
- Express slope in context, using terms like increasing or decreasing. Use different ways of expressing differences between slopes (e.g., “increasing faster”).
- Ensure students are familiar with and have opportunities to practice with the Desmos calculator.
- When asking students to identify functions from tables, include examples where coordinate pairs are repeated in the table or list and remain a function.

Expressions, Equations, and Inequalities

- Have students explain what a question is asking. Ensure they pay attention to the language of the question.
- Practice creating or completing equations or asking students to change an equation so that it has one solution, no solutions, or infinite solutions. For example, give students the left-hand side of the equation and ask them to create the right side of the equation so it has one, no, or infinite solution(s).
- Teach a problem-solving protocol. Students should know how to read a problem, what they are being asked, how to find important information, and how to solve. Do this throughout the year.
- Review older topics throughout the year to build perseverance.
- Teach exponent laws before introducing scientific notation.
- Practice moving variables around in equations; not all equations will appear in $y = mx + b$ format. Focus on multiple starting representations, including non-standard linear forms.

Geometry and Measurement

- Encourage students to find multiple ways to solve angle measure problems, when two parallel lines are cut by a transversal. Assure students are familiar with the right-angle mark in the corner of figures.
- Use graph paper or manipulatives to teach transformations. Ask students to graph transformations in various ways. Practice transformations or finding distance on and off a graph.
- Work with shapes where the angles are not given explicitly.
- Ensure students are familiar with vocabulary. Require students to use the correct vocabulary in the classroom.

Data Analysis, Statistics, and Probability

- Ensure students know the parts of an equation. Ask them to make connections between what they already know and what is represented in the equation.
- Make connections to other standards, and plan lessons that can teach multiple standards (e.g., connecting scatter plots and lines of best fit with linear equations).
- Ask students to talk about what they observe in a table.
- Show students a variety of examples and situations. Practice solving by substituting for both x and y (not always solving for y only).