EOCEP Algebra 1

2024 Test Data Review Report

Data Recognition Corporation and the South Carolina Department of Education Office of Assessment and Standards convened a panel of content experts to review item data from the South Carolina End-of-Course Examination Program (EOCEP) assessment of the 2015 South Carolina College- and Career-Ready Math Standards. The panel of educators 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

- Explicitly teach students mathematical vocabulary. Consider using strategies such as the Frayer model, graphic organizers, visual glossaries, anchor charts, and other strategies that are consistent with teaching multi-lingual learners. Use word walls and add to them throughout the year and continue to have students engage with it. Encourage the use of mathematical terminology and vocabulary in class.

- Give positive reinforcement (“make a big deal of it”) when students use vocabulary correctly and rephrasing when they don’t. “Talking like mathematicians = Thinking like mathematicians”

- Constantly reinforce academic language ex: “plug in” vs “substitute.” Use real world examples, we “substitute” in football when someone comes in for your position. The running back position is still on the field, it just has a different “value.” This is true in class as well. When there is a “substitute” teacher the position of teacher remains in the classroom with a new “value” for the day.

- The use of reading strategies, such as pre-teaching vocabulary is helpful for ML and SPED students as well as students who speak English as a first language. We should not assume that students know math words. It’s good practice to be mindful that math is a new language for some of them as well.

- When teaching vocabulary, pay attention to words and phrases such as exponentially, at least, at most, zero, root, factor, solution, x-intercept, in word problems and real-world situations.

- Periodically ask students to round answers to the nearest whole, tenth, hundredth, etc. and also ask for a specific number of decimal places.

- Students should be familiar with the Desmos testing calculator. This calculator is available on the Desmos website under “Resources” and then “Assessments.” Click on South Carolina to access the testing calculators.

- Students should have exposure to dimensional analysis in real-world items. Items may be given with one unit and there may need to be a conversion to a different unit as part of determining the answer.

Algebra

- Practice in groups with real-world scenarios and allow students to discuss their approach to solving a problem. Use error analysis to help students reason through the appropriateness of a particular strategy.
- Ask students to graph their solutions when problem-solving; allow them to find numbers that “fit” to make problem-solving less abstract.
- Use graphic organizers for comparisons based on verbal descriptions, equations, and graphs.
- Provide practice opportunities with literal equations and teach students to persevere with more difficult problems. Error analysis may be helpful to spark a class discussion on which way works or doesn’t work. Show students that each step in a solution produces an equivalent equation.
- Emphasize the *process* of problem-solving, not just getting the correct answer. Ask students to explain or interpret their answer and reason through the steps they took to get there. Students should understand that there are multiple ways to get the same answer. Group discussions are a good way for students to see and compare alternative methods.
- Teach students how to find the discriminant and what it represents.
- Practice using different methods to find solutions, such as factoring, completing the square and the quadratic formula. Ask students to find an equivalent form of a given equation that best shows the zeros, or shows the vertex, or is best to begin factoring. Show students that different methods result in the same solutions. When in two variables connect this to other graphical and tabular representations.
- Have students solve for **both** independent and dependent variables in equations. Encourage students to find multiple paths to the solution.
- Use multiple representations of the same problem (e.g., graph, equation, verbal description, real-world situation). Connect a graphical representation to the number of solutions. Use card sort tasks to match forms to usefulness—give students opportunities to explain their reasoning.
- Use error analysis to strengthen students’ mathematical reasoning. Ask students to explain why the wrong answer is wrong rather than simply selecting the correct response. Give students many opportunities to defend their reasoning, especially with situations when there is no single correct answer. Build confidence and perseverance.

Functions

- Practice graphing solutions and letting students see how changing a number affects the graph. Ask students to determine what change is needed to affect the graph in a particular way.
- Ensure students understand and are comfortable with function notation. Ask students to compare different forms of functions and translate between them. Teachers suggested having students learn forms by name. For example, with quadratics, the forms are standard, vertex, and factored. Moreover, students must understand why or when each linear, quadratic, or exponential form should be used.
- Ensure students understand the connection between tables and graphs. Scaffold that connection first with words: sentence frames ("____ per ____" for slope) or sentence starters ("The y-intercept is ____ because ____").
- Look at all function families at the beginning of the school year and then track them throughout the year as you work through the curriculum. Ensure students can recognize them in tables, graphs, and verbal descriptions. Reinforce understanding of vocabulary (slope, range, domain, etc.) that defines each type of function. Compare "constant rate of change" with "average rate of change."
- Use guided notes to scaffold learning for exponential values.
- Ensure students understand the difference between "first term" and "initial value." Understanding of term numbers is essential.
- Practice converting word problems to tables as well as equations to help students recognize linear vs. exponential equations.

Number and Quantity; Interpreting Data

- Practice with longer problems or reading-intensive problems to build perseverance. Start with group work or partners but build toward students having confidence to work through problems independently.
- Compare or analyze functions to build critical thinking skills (e.g., "What happens when we change ____?" or "What should we do to make this true?")
- Teach that squares and square roots are inverses. Teach that 2 is the "invisible index" with square roots. Show how to look for perfect squares.
- Practice writing out all variables and circling counts to create groups (square needs 2, cube needs 3, etc.). Allow students to recognize the pattern themselves.
- Review prime factorization from earlier grades to help with simplifying radicals.

- Relate rational exponents back to fractional understanding/parts and wholes.
- Let students explore rational and irrational numbers using a calculator. Ask them to determine which type of number the solution is. Let them plug in different numbers to see what happens.
- Embed word problems and real-world situations into lessons on a daily basis. Students should expect to see word problems, not just numbers; they should expect math questions to be reading-based.
- Ensure students know what the y-intercept is and how to interpret it. Teach that the y-intercept is the “starting point” and ask students to interpret it in context-based problems.