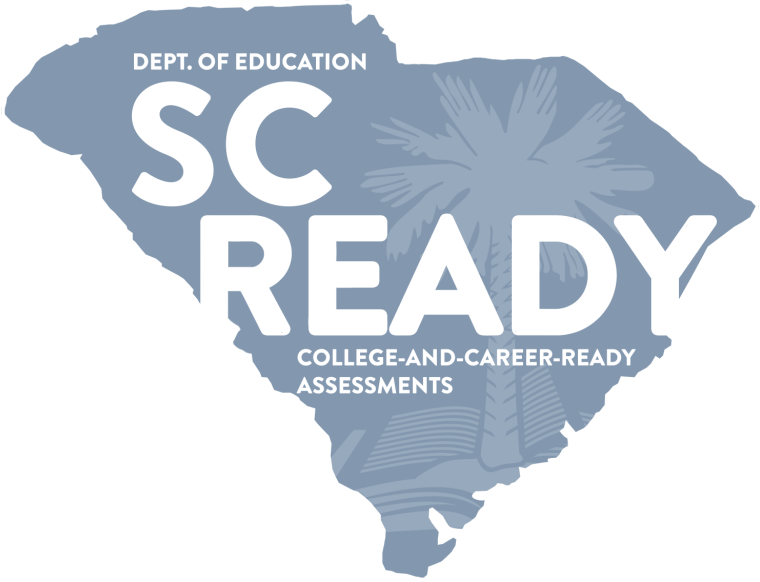
SOUTH CAROLINA
DEPARTMENT OF EDUCATION



Mathematics Assessment Specifications for Teachers
8th Grade

Office of Assessment and Standards

Updated September 2025

South Carolina Department of Education

Contents

Introduction

The SC READY Mathematics Assessment Specifications for Teachers is based upon the development of the South Carolina College- and Career-Ready Assessments (SC READY) that measures the 2025 South Carolina College- and Career-Ready (SC CCR) Mathematics Standards. The assessment specifications provide important information regarding the content to be measured. The assessment specifications also serve as a road map to guide South Carolina educators in the development and subsequent review of test items that best measure the 2025 SC CCR Math Standards for a given grade-level. These documents are intended as a guide for test item developers working in and with the Office of Assessment and Standards and not as a curriculum or instructional guide. The information found within these documents reflects the content limits and the foundational knowledge targets addressed by the state assessment. *Please note: This document is reviewed and updated annually to ensure alignment with current standards and assessment practices*.

Each test item specification is aligned to the given strand, standard, and grade-level indicator, and includes the following key information:

- Example Tasks
- Assessment Guidelines
- Webb's Depth of Knowledge (DOK) or cognitive level(s)
- Item types

Assessment Specifications Descriptions

Strands: This document is divided into four major strands: Data, Probability, and Statistical Reasoning (DPSR); Measurement, Geometry, and Spatial Reasoning (MGSR); Numerical Reasoning (NR); and Patterns, Algebra, and Functional Reasoning (PAFR).

Standards and Indicators: According to the *Procedures for Cyclical Review of South Carolina Academic Standards*, "academic standards are statements of the most important, consensually determined expectations for student learning in a particular discipline. Each of the newly revised South Carolina standards statements will be supported by specific instructional objectives called indicators" (Barton & Spearman, 2016). Each standard contains one or more vertically articulated grade-level indicators. The grade-level indicators set the end-of-year learning expectation.

***Math Vocabulary for Assessment*:** The words included are academic terms related to the assessment. It is important to note that the Math Vocabulary for Assessment is *not an exhaustive list*.

Indicator Insights: Indicator Insights provide an understanding of the indicator for the classroom teacher. These insights provide teachers with clarifying information about the expectations and/or the content of the indicator. Some insights may provide connections to indicators in other standards or strands.

Example Tasks: The intent of this section is to describe examples of how the attached indicator may be assessed. The example tasks are *not an exhaustive list*.

Assessment Guidelines: Parameters that define the learning expectations. These guidelines provide a measurable framework for assessing student's knowledge, skills, and abilities, however, classroom work *should extend beyond these limits*. Prior knowledge such as key words/terms, phrases, classifications, etc., from previous grade level standards is an expectation and may be assessed in test items.

Depth of Knowledge (DOK): Depth of knowledge involves the cognitive complexity, or the nature of thinking, required for a given test item. Webb's DOK levels are used in the development of test items to assess cognitive demand. Therefore, when developing test items with DOK in mind, each test item should be as demanding cognitively as what the actual standard describes. Webb's DOK includes four levels, arranged from low (basic recall) to high (extended thinking). Each test item in the SC READY Mathematics assessment is written to one of the following three levels of cognitive complexity:

- Level 1: Recall
- Level 2: Application of a Skill/Concept
- Level 3: Strategic Thinking

Item Types: The SC READY Mathematics assessments are composed of various test item types

- **Selected-Response (SR) Items:** Students are presented with a test item and four possible answer options. Students demonstrate their knowledge by selecting the one correct answer. A correct response to an SR test item is worth one score point in the SC READY Mathematics assessment.
- **Multi-Select (MS) Items**: Students are presented with a test item and 5-6 possible answer options. Students demonstrate their knowledge by selecting only the two correct answers.
- **Technology-Enhanced (TE) Items:** TE items share the same functional structure as traditional test items. All test items are worth one score point. TE items include, but are not limited to, the following:

Type of Item	Description
Drag and Drop Input	Students click on selectable objects and sort them into groups, steps, or other arrangements to demonstrate their knowledge. Some examples of selectable objects include single numerical values, numerical expressions or equations, algebraic equations or expressions, graphs, statements, operational signs, geometric figures, and tables.
Drop-Down Input	Students are expected to select their response from a drop-down list or drop-down menu.
Hot Spot	Students interact with selectable objects to demonstrate their knowledge, skills, and abilities to answer a question. Selectable objects include whole or parts of figures, graphs, tables, verbal descriptions, or symbolic representations.
Matching	Students demonstrate their knowledge by connecting a line from each response in a set of graphics on the left side of the screen to a response in a set of graphics on the right side of the screen.
Match Interaction Table	Students are presented with a matrix consisting of mathematical or English statements across the columns and rows. Students demonstrate their knowledge by selecting one or more correct answers per row to associate correct statements in the matrix.

- **Technology-Enhanced (TE) Constructed-Response Items**: TE Constructed-Response items require students to construct their own response, rather than selecting from predetermined options. All test items are worth one score point. TE Constructed-Response items include, but are not limited to, the following:

Type of Item	Description
Angle Draw Input	Students are presented with a horizontal line. The students demonstrate their knowledge by drawing an appropriate angle as the response.
Graphing Input	The student is presented with a graph. The student is expected to respond by plotting points, drawing a line, or labeling parts of the graph.

Type of Item	Description
Keypad Input	Students are presented with a test item. The student is asked to respond by writing their numerical answer or writing a mathematical expression or equation to answer the test item.
Number Line Input	The student is presented with a number line. The student is expected to respond by plotting points, drawing a line, or labeling parts of the number line.
Statistical Graph Response	Students are presented with a test item. The students demonstrate their knowledge by constructing bar graphs or histograms to answer statistical test items.

Calculator

The SC READY Mathematics Grades 6 – 8 assessment has two sections. A No Calculator section followed by a Calculator section. The No Calculator section, where students may not use a calculator, will be presented first. The second section will be the Calculator section where students may use calculators. Grade 6 students will have access to both the Desmos four-function (basic) and scientific calculators that are embedded into the online testing platform. Students may also use a handheld four-function or scientific calculator on the SC READY Mathematics assessment. Guidance on calculator use during testing can be found on the Calculator Requirements page.

Note: *Any* indicator may be assessed on *either* section of the test—unless the indicator specifically designates otherwise.

Editorial Suggestions

If you have editorial suggestions for annual edits on this document, please complete our form: Mathematics Assessment Specifications for Teachers Editorial Suggestions located on our Quick Links for Teachers page, or scan the QR code.

Acknowledgment

The SCDE Office of Assessment and Standards would like to thank the South Carolina teachers and content specialists who have served on our various assessment committees. Without your expertise and input, this resource would not have been possible.

Data, Probability, and Statistical Reasoning (DPSR)

Standard 8.DPSR.1

Analyze data sets to identify their statistical elements.

Math Vocabulary for Assessment: Scatterplots, correlation, strong, weak, no correlation, negative, positive, or no relationship, inferences, random samples, double line graphs and box plots, back-to-back stem-and-leaf plot

Indicator	**8.DPSR.1.1** Create and analyze scatterplots to represent numerical data sets in mathematical and real-world situations
Indicator Insight	Analyze the correlation of bivariate data points to determine whether it is strong, weak, or has no correlation. Determine if there is a negative, positive, or no relationship.
	Assessment Specifications
Example Tasks	Students will be able to • create a scatterplot to represent a numerical data set • analyze the scatterplot using descriptors for correlation and relationship.
Assessment Guidelines	Assessment should focus on descriptors of strong correlation, weak correlation, no correlation and negative relationship, positive relationship, and no relationship.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.DPSR.1.2** Draw inferences about two populations utilizing representative random samples of comparisons of the shape of the distribution, measures of center, and measures of variability. Limit measures to *mean, median, mode, range, mean absolute deviation, and interquartile range*
Indicator Insight	Give examples of similarities and differences and usefulness of these measures of center and variability. Use visuals such as box plots or stem-and-leaf plots to compare two different populations. Draw inferences about data sets that contain outliers.
8.DPSR.1.2	**Assessment Specifications**
Example Tasks	Students will be able to • compare the two sets of data from two different populations. • draw inferences from two data sets about two different populations.
Assessment Guidelines	Assessment should focus on measures of mean, median, mode, range, mean absolute deviation, and interquartile range. Inferences must reference numerical measures of center and spread, whether those measures are given to or calculated by the student.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.DPSR.1.3** Describe how adding and deleting data throughout the data set can affect the mean, median, mode, and distribution of the data set.
Indicator Insight	Include the effects of outliers in data set discussions.
Assessment Specifications	
Example Tasks	Students will be able to describe the effect of adding or deleting data on the data set.
Assessment Guidelines	Assessment should focus on the effects of mean, median, mode, and distribution.
DOK(s)	2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.DPSR.1.4** For two data sets (numerical or graphical), compare and interpret the centers, spreads, and overlap of data to draw inferences about data in mathematical and real-world situations. Limit displays to double line graphs, back-to-back stem-and-leaf plots, and double box plots.
Indicator Insight	Give a visual comparison between two data sets. This would be a good place to compare correlation versus causation.
8.DPSR.1.2	**Assessment Specifications**
Example Tasks	Students will be able to • compare center, spread, and overlap of two data sets from the same population numerically or graphically. • draw inferences about the center, spread, and overlap from two data sets from the same population numerically or graphically.
Assessment Guidelines	Assessment should focus on displays of double line graphs, back-to-back stem-and-leaf plots, and double box plots. Comparisons may be more informal but must reference a graph/visual.
DOK(s)	2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 8.DPSR.2

Calculate and interpret probability.

Math Vocabulary for Assessment: compound event, tree diagram, independent event , dependent event

Indicator	**8.DPSR.2.1** Determine the sample space for a compound event
Indicator Insight	Use organized lists, tables, or tree diagrams.
8.DPSR.2.1	**Assessment Specifications**
Example Tasks	Students will be able to • create a display to represent the outcomes of a compound event. • determine if an event is a compound event. • determine the sample space of a compound event.
Assessment Guidelines	Assessment should be limited to no more than 5 events making the compound event. Students may be assessed on compound events that involve more than 2 events. Sample space of a compound event is defined as the set of all possible outcomes. Since sample space is a set, outcomes should not be repeated in this list.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.DPSR.2.2** Calculate and interpret the probability of compound independent and dependent events.
Indicator Insight	Use organized lists, tables, and tree diagrams. Report probability as a fraction, decimal, or percentage. Include replacement when finding probability.
Assessment Specifications	
Example Tasks	Students will be able to • determine whether the simple events that make up the compound event are independent or dependent. • calculate the probability for dependent and independent compound events. • interpret probability for dependent and independent compound events.
Assessment Guidelines	Students are expected to be able to represent probabilities as fractions, decimals or percentages. Assessment should be limited to no more than 5 events making the compound event.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Measurement, Geometry, and Spatial Reasoning (MGSR)

Standard 8.MGSR.1

Determine the measurements of geometric figures.

Math Vocabulary for Assessment: cone, cylinder, sphere, Pythagorean Theorem, hypotenuse, leg, diagonal

Indicator	**8.MGSR.1.1** Given the geometric formulas, find the volume of cones, cylinders, and spheres in mathematical and real-world situations.
Indicator Insight	Show that the volume of a cone is 1/3 the volume of a cylinder with congruent heights and bases through hands-on experiences. Express volume as both an approximation and an exact answer using π.
8.MGSR.1.1	**Assessment Specifications**
Example Tasks	Students will be able to • find the volume a cone in mathematical or real-world situations. • find the volume a cylinder in mathematical or real-world situations. • find the volume a sphere in mathematical or real-world situations.
Assessment Guidelines	Students are expected to be able to provide exact answers using π as well as approximations. Test items where students are expected to use an approximation for pi should include the approximation used in the test item. Students are provided with a reference sheet for the formulas which is provided at the end of this document. Students are not expected to work backwards i.e. students must be given all the information to find the volume, not be provided a volume and find a height or similar missing value.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.1.2** Find the distance between any two points in the coordinate plane using the Pythagorean Theorem.
Indicator Insight	Use the Pythagorean Theorem to find the length of the diagonal line in the coordinate plane by drawing a right triangle.
8.MGSR.1.2	**Assessment Specifications**
Example Tasks	Students will be able to apply the Pythagorean Theorem to find distance in the coordinate plane.
Assessment Guidelines	Students are provided with a reference sheet for the Pythagorean Theorem which is provided at the end of this document.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.1.3** Given the Pythagorean Theorem, determine unknown side lengths in right triangles in mathematical and real-world situations.
Indicator Insight	Include three-dimensional situations. The Pythagorean Theorem can be used to find any side of the right triangle, not just the hypotenuse.
Assessment Specifications	
Example Tasks	Students will be able to apply the Pythagorean Theorem to find an unknown side length of a right triangle.
Assessment Guidelines	Students are expected to be able to solve problems where the unknown value is either the hypotenuse or a leg of the triangle. Students are provided with a reference sheet for the Pythagorean Theorem which is provided at the end of this document.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.1.4** Determine if a given set of sides forms a right triangle.
Indicator Insight	Identify the pattern in Pythagorean triples. Use *Converse of Pythagorean Theorem*.
Assessment Specifications	
Example Tasks	Students will be able to use the converse of the Pythagorean Theorem to determine if a triangle is a right triangle.
Assessment Guidelines	Students are provided with a reference sheet for the Pythagorean Theorem which is provided at the end of this document.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 8.MGSR.2

Determine angle and/or side relationships.

Math Vocabulary for Assessment: parallel lines, transversal, corresponding angles, same side interior angles, alternate interior angles, alternate exterior angles, Exterior Angle Theorem, congruent and similar figures

Indicator	**8.MGSR.2.1** Determine missing angle measurements created when parallel lines are cut by a transversal.
Indicator Insight	Consider complementary, supplementary, vertical, adjacent, corresponding, same side interior, alternate interior, and alternate exterior angles. Use examples with more than one transversal.
8.MGSR.2.1	**Assessment Specifications**
Example Tasks	Students will be able to • determine missing angle measures when parallel lines are cut by a transversal. • determine value of a variable in an expression that represents an angle measure in a figure of parallel lines cut by a transversal.
Assessment Guidelines	Students are expected to be able to solve when there is more than one transversal. Students are expected to be able to solve problems where the measure of the angle is an algebraic expression or where an algebraic expression or equation must be used to solve for the angle measurement. Variables may be on both sides of the equation.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.2.2** Determine if two-dimensional figures are congruent or similar.
Indicator Insight	Use proportional reasoning to determine if figures are congruent or similar.
Assessment Specifications	
Example Tasks	Students will be able to • determine if figures are congruent. • determine if figures are similar.
Assessment Guidelines	Students are not expected to solve for missing side lengths or angle measure here.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.2.3** Identify the congruent corresponding angles of similar polygons.
Indicator Insight	Use appropriate labeling and write congruence statements.
Assessment Specifications	
Example Tasks	Students will be able to identify the congruent corresponding angles of similar polygons.
Assessment Guidelines	The polygons may be presented in different orientations (e.g., rotated or reflected) to ensure students understand correspondence based on shape and not just position.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.2.4** Discover and apply the Exterior Angle Theorem of triangles to find a missing angle.
Indicator Insight	Connect to the study of supplementary angles from seventh grade.
8.MGSR.2.4	**Assessment Specifications**
Example Tasks	Students will be able to • find missing interior angles using the Exterior Angle Theorem • find missing exterior angles using the Exterior Angle Theorem.
Assessment Guidelines	Algebraic expressions and/or equations may be used.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.2.5** Apply proportional reasoning to find the missing side lengths of two similar figures.
Indicator Insight	Given lengths of corresponding sides, use a proportion to solve for the missing side. Sides could include algebraic expressions limited to linear equations.
8.MGSR.2.5	**Assessment Specifications**
Example Tasks	Students will be able to • find missing side lengths in similar figures. • find the value of a variable in an expression that is used to represent the length of a side in two similar figures.
Assessment Guidelines	Assessment should focus on algebraic expressions that are linear.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 8.MGSR.3

Graph on a coordinate plane.

Math Vocabulary for Assessment: transformation, rotation, reflection, translation, preimage, image, rotational symmetry, clockwise, counterclockwise, dilation, map,

Indicator	**8.MGSR.3.1** Identify the transformation as rotation, reflection, and/or translation. Limit rotations to multiples of 90 degrees centered on the origin.
Indicator Insight	Transformation can be on or off a coordinate plane. Given a preimage and image, name the transformation. Give attention to the congruence of the two images. Use a variety of methods including, but not limited to, manipulatives and technology.
8.MGSR.3.1	**Assessment Specifications**
Example Tasks	Students will be able to • identify the type of transformation that produced an image given the preimage. • identify the graph produced by a specific type of transformation when given the preimage.
Assessment Guidelines	Students are only expected to identify the type of transformation, not perform a transformation or provide details. Assessment should focus on rotations that are multiples of 90° centered at the origin and a single transformation. Students should be familiar with both ways to describe a transformation: ABC →A'B'C' notation as well as mapping ABC to GHI.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.3.2** Identify congruent angles and congruent line segments of a preimage and its image.
Indicator Insight	Include single and/or multiple rigid transformations. Write congruence statements.
Assessment Specifications	
Example Tasks	Students will be able to • identify congruent angles and line segments of a preimage and image. • Write congruence statements when identifying congruent angles and line segments.
Assessment Guidelines	Students are expected to be exposed to single as well as multiple rigid transformations. Students should be able to recognize and understand commonly used geometry symbols. Students should be familiar with both ways to describe a transformation: ABC →A'B'C' notation as well as mapping ABC to GHI.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.3.3** Translate geometric figures vertically and/or horizontally.
Indicator Insight	Use verbal descriptions as well as ordered pairs to describe the translations. Use a variety of methods including, but not limited to, manipulatives and technology.
Assessment Specifications	
Example Tasks	Students will be able to • identify the image produced by a translation of a geometric figures vertically or horizontally. • identify the translation that produced an image given the preimage.
Assessment Guidelines	Students are expected to be able to do both vertical and horizontal translations as well as a combinations of both in one test item. Students are expected to be able to describe the translation using words or ordered pairs i.e. translate 4 units down and 6 units to the right is the same as (x + 6, y - 4). Students should be familiar with both ways to describe a transformation: ABC →A'B'C' notation as well as mapping ABC to GHI.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.3.4** Reflect geometric figures with respect to the x-axis and/or y-axis.
Indicator Insight	Focus only on reflections over the x-axis or y-axis, not over any other lines. Use a variety of methods including, but not limited to, manipulatives and technology.
Assessment Specifications	
Example Tasks	Students will be able to • identify the image produced by a reflection of a geometric figures. • identify the reflection that produced an image given the preimage.
Assessment Guidelines	Assessment should focus on reflections over the *x*-axis or the *y*-axis. Students should be familiar with both ways to describe a transformation: ABC →A'B'C' notation as well as mapping ABC to GHI.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.3.5** Rotate geometric figures 90, 180, and 270 degrees, both clockwise and counterclockwise, about the origin of a coordinate plane.
Indicator Insight	Identify rotational symmetry of two-dimensional figures. Use a variety of methods including, but not limited to, manipulatives and technology. This is students' introduction to symmetry.
8.MGSR.3.5	**Assessment Specifications**
Example Tasks	The student will be able to • identify the image produced by a rotation of geometric figures. • identify the rotation that produced an image given the preimage.
Assessment Guidelines	Students are expected to know clockwise, and counterclockwise not positive and negative degree turns. Assessment should focus on rotations of 90°, 180°, or 270°, clockwise or counterclockwise, centered at the origin. Students should be familiar with both ways to describe a transformation: ABC →A'B'C' notation as well as mapping ABC to GHI.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.3.6** Create a dilation using a given scale factor and describe the effect of a dilation.
Indicator Insight	Dilation centered at origin. Name the scale factor. Use a variety of methods including, but not limited to, manipulatives and technology.
Assessment Specifications	
Example Tasks	Students will be able to • identify the image produced by a dilation of geometric figures. • identify the dilation that produced an image given the preimage. • describe the effect of the dilation on characteristics of the figure.
Assessment Guidelines	Students should be familiar with both ways to describe a transformation: ABC →A'B'C' notation as well as mapping ABC to GHI.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.MGSR.3.7** Describe the effect of a series of transformations, including dilations, translations, rotations, and reflections, on two-dimensional figures using coordinates on the coordinate plane.
Indicator Insight	Rotate in multiples of 90 degrees around the origin and dilate centered on origin. Translate geometric figures horizontally and vertically. Use ordered pairs to describe the translation. Given two figures, determine the sequence of transformations. Use a variety of methods including, but not limited to, manipulatives and technology.
8.MGSR.3.7	**Assessment Specifications**
Example Tasks	Students will be able to • describe the effects of a series of transformations on two-dimensional figures using coordinates. • identify the image produced by a series of transformations on geometric figures. • identify the series of transformations that produced an image given the preimage.
Assessment Guidelines	Assessment should focus on dilation, translation, rotation, and reflection and should be limited as mentioned in each standard related to each type of transformation. (other 8.MGSR.3 standards) Students should be familiar with both ways to describe a transformation: ABC →A'B'C' notation as well as mapping ABC to GHI.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Numerical Reasoning (NR)

Standard 8.NR.1

Translate among multiple representations of rational numbers.

Math Vocabulary for Assessment: terminating and repeating decimals, bar notation

Indicator	**8.NR.1.1** Convert any form of a rational number to any other form including fractions (mixed numbers), decimals, and percentages.
Indicator Insight	Include the conversion of repeating decimals to fractions.
8.NR.1.1	**Assessment Specifications**
Example Tasks	Students will be able to • convert a fraction to a decimal or vice versa. • convert a fraction to a percent or vice versa. • convert a decimal to a percent or vice versa.
Assessment Guidelines	Students are expected to be able to convert repeating decimals to fractions.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 8.NR.2

Utilize rational numbers in mathematical and real-world situations

Math Vocabulary for Assessment: is greater than or equal to (≥), is less than or equal to (≤)

Indicator	**8.NR.2.1** Compare real numbers and write statements using is equal to (=), is not equal to (≠), is less than (<), is greater than (>), is greater than or equal to (≥), or is less than or equal to (≤).
Indicator Insight	Comparisons could include more than two numbers and should include problems based on real-world situations.
8.NR.2.1	**Assessment Specifications**
Example Tasks	Students will be able to • compare real numbers. • write statements comparing real numbers using <, >, =, ≤, or ≥.
Assessment Guidelines	Students are expected to compare more than 2 numbers. Irrational numbers used that are non-perfect square and cube roots have limits in 8.PAFR.3.2. The use of real numbers makes this standard different from 7.NR.2.1 which only uses rational numbers. Students should be familiar with comparing numbers with compound inequalities
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.NR.2.2** Classify and order the subsets of real numbers in the number system including natural, whole, integer, rational, and irrational numbers.
Indicator Insight	Use different types of Venn diagrams to classify. Use a number line to locate and order numbers. Describe the difference between a rational and an irrational number. Classify and order simplified expressions.
8.MCSR.2.2	**Assessment Specifications**
Example Tasks	Students will be able to • order numbers on a number line. • differentiate between rational and irrational numbers. • classify numbers into the subsets of the real numbers. • create a diagram of real numbers in the number system.
Assessment Guidelines	Assessment should focus on subsets including natural, whole, integer, rational, and irrational numbers.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Patterns, Algebra, and Functional Reasoning (PAFR)

Standard 8.PAFR.1

Determine if a table, graph, verbal description, or equation represents a function and describe its characteristics.

Math Vocabulary for Assessment: slope intercept form, linear function, nonlinear function, constant rate of change, y-intercept, mapping, domain, range, intervals of increasing or decreasing, constant, discrete, continuous, intercepts

Indicator	**8.PAFR.1.1** Define an equation in slope-intercept form *(y = mx + b)* as being a linear function.
Indicator Insight	Introduce the concept that slope-intercept form is a linear function.
8.PAFR.1.1	**Assessment Specifications**
Example Tasks	Students will be able to determine which equation is linear.
Assessment Guidelines	Students are expected to know linear functions in slope-intercept form only. Students are expected to be able to solve test items where there is an initial symbolic representation other than slope-intercept form.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.1.2** Identify and describe the constant rate of change and the y-intercept of a linear function
Indicator Insight	Interpret the rate of change and y-intercept in context. Connect $y = kx$ (constant of proportionality) that was learned in seventh grade to constant rate of change.
8.PAFR.1.2	**Assessment Specifications**
Example Tasks	Students will be able to • identify the constant rate of change and *y*-intercept of a linear function. • describe the constant rate of change and *y*-intercept of a linear function.
Assessment Guidelines	Students are expected to be able to identify from tables, graphs, verbal descriptions, and equations. Students are expected to be able to solve test items where there is an initial symbolic representation other than slope-intercept form.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.1.3** Determine if a graph, table, mapping, or verbal description is a function (linear or nonlinear) or not a function.
Indicator Insight	Have students recognize that a table may not determine a function.
8.PAFR.1.2	**Assessment Specifications**
Example Tasks	Students will be able to determine if a relation is a function.
Assessment Guidelines	Students are expected to see linear and non-linear functions. Students are expected to see examples in graphs, tables, mappings, or verbal descriptions. Students are expected to be able to solve test items where there is an initial symbolic representation other than slope-intercept form.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.1.4** Describe the key features of given functions, including domain, range, intervals of increasing or decreasing, constant, discrete, continuous, and intercepts.
Indicator Insight	Identify the domain and range as a list of numbers or as an inequality (could include compound inequalities). Describe whether the function is increasing, decreasing, or constant.
Assessment Specifications	
Example Tasks	Students will be able to • graph a linear function and then describe the key features of the function. • given a graph of a non-linear function, describe the key features.
Assessment Guidelines	Students are expected to be able to describe domain, range, intervals of increasing or decreasing, constant, discrete, continuous, and intercepts. Students are expected to use compound inequalities when necessary to describe intervals. Students are expected to be able to solve test items where there is an initial symbolic representation other than slope-intercept form.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.1.5** Use multiple representations including mappings, tables, graphs, verbal description, and equations (only when linear) of two functions to compare the functions and draw conclusions.
Indicator Insight	Technology such as spreadsheets for tables and graphing tools for graphs is suggested.
8.PAFR.1.5	**Assessment Specifications**
Example Tasks	Students will be able to • compare two functions. • draw conclusions about two functions.
Assessment Guidelines	Students are expected to see functions presented as mappings, tables, graphs, verbal description, or, for linear functions, equations. Students are expected to be able to solve test items where there is an initial symbolic representation other than slope-intercept form.
DOK(s)	2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.1.6** Translate among the multiple representations, including mappings, tables, graphs, verbal description, and equations (only when linear) of a function.
Indicator Insight	Draw the graph from a written description or write a description of the graphical representation. Technology such as spreadsheets for tables and graphing tools for graphs is suggested.
8.PAFR.1.6	**Assessment Specifications**
Example Tasks	Students will be able to translate from one representation of a function to another representation.
Assessment Guidelines	Students are expected to translate between representations including mappings, tables, graphs, verbal description, or, for linear functions, equations. Students are expected to be able to solve test items where there is an initial symbolic representation other than slope-intercept form.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 8.PAFR.2

Write, simplify, and evaluate algebraic expressions; write and solve algebraic equations and inequalities.

Math Vocabulary for Assessment: one solution, no solution, infinite (number of) solutions, rate of change, slope, linear equation

Indicator	**8.PAFR.2.1** Solve multi-step one-variable equations and inequalities with variables on both sides with rational coefficients.
Indicator Insight	Utilize previously learned knowledge of writing and solving equations and inequalities as a foundation to introduce variables on both sides.
8.PAFR.2.1	**Assessment Specifications**
Example Tasks	Students will be able to • write multi-step equations or inequalities to represent context. • solve multi-step equations or inequalities with variables on both sides.
Assessment Guidelines	Assessment should focus on coefficients that are rational numbers.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.2.2** Describe single-variable equations as having one solution, no solution, or an infinite number of solutions.
Indicator Insight	Students need to recognize the three types of possible solutions using tables, graphs, or equations.
8.PAFR.2.2	**Assessment Specifications**
Example Tasks	Students will be able to • identify when a single variable equation has one solution, no solution, or an infinite number of solutions. • recognize the characteristics that create an equation with one solution, no solutions, or infinite solutions.
Assessment Guidelines	Assessment may ask students to justify or explain their answer.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.2.3** Identify the rate of change for a linear function as the slope of the line
Indicator Insight	Give students a variety of experiences to build understanding that the slope is the same as the rate of change.
8.PAFR.2.3 Assessment Specifications	
Example Tasks	Students will be able to recognize that the rate of change of a linear function is the same as the slope of the line.
Assessment Guidelines	Students are expected to be able to use multiple linear function representations.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.2.4** Explain why the slope, m, is the same between any two distinct points on a linear graph.
Indicator Insight	Students need to understand that the distance between points on the line is always proportionally the same.
8.PAFR.2.4 **Assessment Specifications**	
Example Tasks	Students will be able to explain why the slope is the same between any two points on a linear graph.
Assessment Guidelines	Assessment may ask students to explain, using similar triangles as evidence, why the slope is the same between any two distinct points on a linear graph.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.2.5** Given a table or a graph, identify the slope and the y-intercept of a line and write a linear equation to express that line.
Indicator Insight	Include multiple representations and verbal descriptions.
8.PAFR.2.5	**Assessment Specifications**
Example Tasks	Students will be able to • identify slope and *y*-intercept of a line given a graph or table. • write a linear equation for a line given a graph or table.
Assessment Guidelines	Students are expected to see multiple representations of equations in the prompt, but answers should be written only in slope-intercept form. Students are not expected to know the names of all the forms of equations.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 8.PAFR.3

Apply mathematical patterns, properties, and algorithms to the set of rational numbers to find sums, differences, products, and quotients and to write equivalent expressions.

Math Vocabulary for Assessment: perfect square, perfect cube, square root, cube root

Indicator	**8.PAFR.3.1** Analyze patterns of perfect squares and perfect cubes to evaluate square roots and cube roots. Limit to square roots less than or equal to 400 and cube roots less than or equal to 1,000.
Indicator Insight	Look at patterns to make connections to geometric squares and cubes. Use tiles, unit cubes, and/or centimeter cubes to build geometric squares and cubes.
8.PAFR.3.1	**Assessment Specifications**
Example Tasks	Students will be able to evaluate square roots or cube roots.
Assessment Guidelines	Assessment should focus on square roots of numbers less than or equal to 400 and cube roots of numbers less than or equal to 1,000.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.3.2** Approximate non-perfect square roots and cube roots to nearest tenth. Limit to square roots less than or equal to 400 and cube roots less than or equal to 1,000.
Indicator Insight	Use a variety of strategies including, but not limited to, manipulatives and number lines, to help build student understanding.
8.PAFR.3.2	**Assessment Specifications**
Example Tasks	Students will be able to approximate non-perfect square or cube roots.
Assessment Guidelines	Assessment should focus on square roots of numbers less than or equal to 400 and cube roots of numbers less than or equal to 1,000. Limit approximations to the tenths place.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**8.PAFR.3.3** Apply laws of exponents to simplify algebraic expressions involving no more than three variables and integer exponents.
Indicator Insight	This indicator extends the laws of exponents from seventh grade where students are evaluating only numerical expressions.
Assessment Specifications	
Example Tasks	Students will be able to simplify algebraic expressions with variables and integer exponents.
Assessment Guidelines	Assessment should be limited to no more than three unique variables. Test items may involve variables with coefficients.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Appendix: Student Reference Sheet

A reference sheet of appropriate formulas is provided to students in Grade 8 during testing. Below is the information provided to students.

SC READY Mathematics Reference Sheet

Grade 8

Shape	Formulas
Cone	$V = \frac{1}{3}\pi r^2 h$
Cylinder	$V = \pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$

Pythagorean Theorem

$$a^2 + b^2 = c^2$$