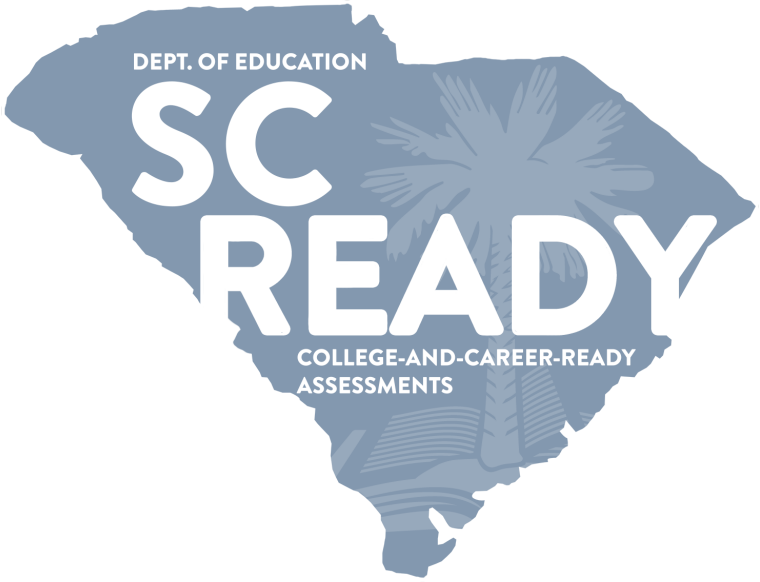
SOUTH CAROLINA
DEPARTMENT OF EDUCATION



Mathematics Assessment Specifications for Teachers
7th Grade

Office of Assessment and Standards

Updated September 2026

South Carolina Department of Education

Table of Contents

Introduction **2**

Assessment Specifications Descriptions 2
Math Vocabulary for Assessment *3*
Example Tasks *3*
Assessment Guidelines *3*
Item Types *3*
Calculator 5
Editorial Suggestions 5
Acknowledgment 5

Data, Probability, and Statistical Reasoning (DPSR) **6**

Standard 7.DPSR.1 6
Standard 7.DPSR.2 10

Measurement, Geometry, and Spatial Reasoning (MGSR) **14**

Standard 7.MGSR.1 14
Standard 7.MGSR.2 20
Standard 7.MGSR.3 24

Numerical Reasoning (NR) **25**

Standard 7.NR.1 25
Standard 7.NR.2 26

Patterns, Algebra, and Functional Reasoning (PAFR) **27**

Standard 7.PAFR.1 27
Standard 7.PAFR.2 30
Standard 7.PAFR.3 34

Appendix: Student Reference Sheet **39**

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 South Carolina Department of Education (SCDE) Office of Assessment and Standards (OAS) 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.

- ***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
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 Grade 7 assessment has two sections: a No Calculator section followed by a Calculator section. The No Calculator section, in which students may not use a calculator, is presented first. The second section is the Calculator section, in which students may use a calculator. Grade 7 students have access to both the Desmos scientific and graphing calculators embedded within the online testing platform. Students may also use a handheld scientific or approved graphing 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 7.DPSR.1

Analyze data sets to identify their statistical elements.

Math Vocabulary for Assessment: stem-and-leaf plot, mean, mean absolute deviation, measure of variability (spread) and center, histogram, key, interval, bin, frequency, frequency table

Indicator	**7.DPSR.1.1** Create stem-and-leaf plots to represent numerical data sets in mathematical and real-world situations.
Indicator Insight	Teach using data displays, not just numerical sets. This is the students' first exposure to stem-and-leaf plots.
	Assessment Specifications
Example Tasks *(This list is non-exhaustive.)*	Students will be able to create stem-and-leaf plots.
Assessment Guidelines	Assessment items should include a key. (Ex: 3 | 0 means 30 students). Data displays could include tables or dot plots. Students may be required to interpret stem-and-leaf plots with single-digit or multi-digit stems.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.DPSR.1.2** Use the shape of the graph to select the measure of center (mean, median, or mode) that best describes the data set.
Indicator Insight	This indicator continues the work with spread and center started in sixth grade. The shape includes right skew, left skew, symmetric, uniform, bimodal (two modes), and outliers. This is students' first introduction to mean.
7.DPSR.1.2	**Assessment Specifications**
Example Tasks *(This list is non-exhaustive.)*	Students will be able to determine the measure of center that best describes a data set based on the shape of the graph.
Assessment Guidelines	Students are expected to see mean here, as this is an expansion from sixth grade. (6.DPSR.1.3) Students are not expected to calculate values; they are only expected to decide which is best and/or explain why. A data point that is an outlier in an assessment item should be obviously more than 1.5 times the IQR below Q1 or above Q3.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.DPSR.1.3** Calculate and interpret the measures of center (mean, median, mode) and spread (mean absolute deviation, interquartile range, range) in mathematical and real-world situations.
Indicator Insight	"Measure of spread" and "measure of variability" should be used interchangeably. Compare the difference between mean, median, and mode. Include all rational numbers in the data sets. This is the students' first exposure to mean absolute deviation.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • calculate measures of center and spread. • interpret measures of center and spread. • compare measures of center.
Assessment Guidelines	Students are expected to see a variety of rational numbers in data sets. Assessment should focus on measures of center of mean, median and mode and measures of spread of mean absolute deviation, interquartile range, and range.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.DPSR.1.4** Create histograms to represent data sets and interpret histograms to answer questions or draw conclusions about data sets
Indicator Insight	Connecting a stem-and-leaf plot to a histogram can be helpful for students. Intervals are also called bins
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • create histograms. • interpret and draw conclusions from histograms.
Assessment Guidelines	Students are not expected to find the mean, median, mean absolute deviation or IQR from histograms. Students may be able to identify a bin as the modal bin and possibly find the range or a close estimate. Assessment should focus on creating histograms only when provided the bin size or the number of bins to use.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 7.DPSR.2

Calculate and interpret probability.

Math Vocabulary for Assessment: sample space, theoretical probability, experimental probability, probability model, trials, relative frequency, fair coin, fair number cube

Indicator	**7.DPSR.2.1** Identify the sample space for a simple event.
Indicator Insight	Simple events were introduced in fifth grade. Distinguish between sample size (sixth grade) and sample space (unique outcomes).
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • identify the sample space for a simple event. • distinguish the difference between sample size and sample space.
Assessment Guidelines	Assessment items may refer to a coin or number cube as a "fair coin" or "fair number cube." Sample space is defined as the set of all possible unique outcomes. Since sample space is a set, outcomes should not be repeated in this list. Students should be familiar with representing a sample space as a set enclosed in braces. For example, the sample space for tossing a fair coin is {H, T}.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.DPSR.2.2** Calculate and interpret the theoretical probability of a simple random event.
Indicator Insight	This is the students' introduction to theoretical probability.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • calculate theoretical probability of a simple event. • interpret theoretical probability of a simple event.
Assessment Guidelines	Students are expected to be able to work with a probability represented as a fraction, decimal, or percent. Assessment items may refer to a coin or number cube as a "fair coin" or "fair number cube."
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.DPSR.2.3** Calculate and interpret the experimental probability of a random event related to a simple experiment.
Indicator Insight	Conduct actual probability experiments and interpret the results.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • calculate the experimental probability of a random event • interpret the experimental probability of a random event. • make a prediction based on experimental probability. • develop a uniform probability model.
Assessment Guidelines	Students are expected to be able to work with a probability represented as a fraction, decimal, or percent. Assessment items may refer to a coin or number cube as a "fair coin" or "fair number cube.”
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.DPSR.2.4** Compare and contrast the experimental and theoretical probabilities for a simple experiment.
Indicator Insight	Simple experiments include randomly selecting a card from a deck, tossing a coin, rolling a die, spinning a spinner, and randomly selecting a colored tile from a bag. Represent the probability as a fraction, decimal, or percent. Use P(event) notation.
7.DPSR.2.2	**Assessment Specifications**
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • compare experimental probability and theoretical probability. • calculate both experimental and theoretical probability for a situation. • determine if a probability generator is performing as expected. • perform experiments to test the validity of probability models.
Assessment Guidelines	Students are expected to be able to work with a probability represented as a fraction, decimal, or percent. Assessment items may refer to a coin or number cube as a "fair coin" or "fair number cube.”
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Measurement, Geometry, and Spatial Reasoning (MGSR)

Standard 7.MGSR.1

Determine the measurements of geometric figures.

Math Vocabulary for Assessment: circle, center, radius, diameter, chord, pi (π), circumference, exact circumference, exact area, Triangle Inequality Theorem, trapezoidal prism

Indicator	**7.MGSR.1.1** Identify the parts of a circle. Limit the parts to *center, radius, diameter, and chord*.
Indicator Insight	Understand the definition of a circle. Be able to distinguish between diameter and other chords. Understand the relationship between radius and diameter
Assessment Specifications 7.MGSR.1.1	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • identify parts of a circle. • label a circle with the names of each part.
Assessment Guidelines	Assessment should focus on the following parts; center, radius, diameter, and chord. Students should be familiar with naming conventions such as Circle A, segment AB, or $\overline{AB}$.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.MGSR.1.2** Describe the relationship between the radius, diameter, and circumference of a circle.
Indicator Insight	Physically explore the attributes of the circumference of a circle as a measure of length using concrete materials. Identify π through a variety of patterns and relationships. These relationships are another application of proportional reasoning.
7.MGSR.1.2	**Assessment Specifications**
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • describe the relationship between radius and circumference of a circle. • describe the relationship between diameter and circumference of a circle. • find radius given the diameter and vice versa.
Assessment Guidelines	Assessments may focus on the symbolic representations and/or verbal descriptions when describing these relationships.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.MGSR.1.3** Solve mathematical and real-world situations involving circumference or area of circles.
Indicator Insight	Practice finding the exact area or circumference of a circle using Pi. Find estimates of area and circumference using the approximations for π ($\boldsymbol{\pi} \approx 3.14$, $\boldsymbol{\pi} \approx 3$, or $\boldsymbol{\pi} \approx 22/7$). Use the formulas to find missing parts in the circumference formula. Find the area from a given circumference. The expectation is not to find the radius or diameter when given the area because that involves finding the square root, and seventh grade indicators do not include finding square roots.
7.MGSR.1.2	**Assessment Specifications**
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • find the circumference of a circle. • find the area of a circle. • solve mathematical or real-world situations involving circumference or area of a circle.
Assessment Guidelines	Students are expected to write answers using the symbol for pi (exact measurement) or the calculator approximation of pi. Test items where students are expected to use an approximation for pi should include the approximation used in the test item. Students are expected to find missing parts in the circumference formula but not a missing radius or diameter in an area formula.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.MGSR.1.4** Determine if three given side lengths can form a triangle using the Triangle Inequality Theorem
Indicator Insight	Use exploration activities to discover patterns to form a triangle leading to the Triangle Inequality Theorem.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • determine if three given side lengths can form a triangle. • given two side lengths, determine possible values for the third side.
Assessment Guidelines	Students are not expected to write the solutions as compound inequalities. Instead, they can be written as two separate inequalities.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.MGSR.1.5** In mathematical and real-world situations, find the volume of right prisms and right pyramids having triangular or quadrilateral bases.
Indicator Insight	Include trapezoidal bases. The formula was discovered in sixth grade. A trapezoid is defined as a quadrilateral with exactly one pair of parallel sides.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • find the volume of a right prism having triangular or quadrilateral bases. • find the volume of a right pyramid having a triangular or a quadrilateral base.
Assessment Guidelines	Students are expected to know the formulas or be able to discover them through exploration. Students are expected to be able to solve problems involving trapezoidal bases. Students are only responsible for learning about "right" prisms and "right" pyramids, not oblique prisms, or pyramids. Right prisms can be defined as prisms whose bases are congruent and parallel, and all the faces meet the base at right angles. Right pyramids can be defined as pyramids made with an apex directly over the center of the base that meets the base at a right angle with the center of the base. Note: *Not all right triangular prisms and right triangular pyramids need to have right triangles as bases*.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.MGSR.1.6** In mathematical and real-world situations, find the surface area of right prisms and right pyramids having triangular or quadrilateral bases.
Indicator Insight	Include trapezoidal bases. Find actual measurements of some figures using rulers to continue the practice from elementary grades.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • find the surface area of right prisms with triangular or quadrilateral bases. • find the surface area of right pyramids with triangular or quadrilateral bases.
Assessment Guidelines	Students are expected to know the formulas or be able to discover them through exploration. Students are expected to be able to solve problems involving trapezoidal bases. Students are only responsible for learning about "right" prisms and "right" pyramids, not oblique prisms, or pyramids. Right prisms can be defined as prisms whose bases are congruent and parallel, and all the faces meet the base at right angles. Right pyramids can be defined as pyramids made with an apex directly over the center of the base that meets the base at a right angle with the center of the base. Note: *Not all right triangular prisms and right triangular pyramids need to have right triangles as bases*. Students will be expected to use the embedded online ruler found on the Online Tutorial Training (OTT) from the DRC Insight Assessment platform.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 7.MGSR.2

Determine angle and/or side relationships.

Math Vocabulary for Assessment: Triangle Sum Theorem, scale drawing, scale factor, similar figures, vertical angles, adjacent angles

Indicator	**7.MGSR.2.1** Determine the measure of the third angle given the measure of the other two angles of a triangle using the Triangle Sum Theorem.
Indicator Insight	The intent of this indicator is to develop a conceptual understanding of the angles inside of a triangle. Write equations to find the missing angle measure.
7.MGSR.2.1 Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • determine a missing angle in a triangle. • solve for a variable in an expression that represents an angle measure. • write an equation to represent the missing angle measure.
Assessment Guidelines	Students are not expected to solve problems involving variables on both sides of the equation for this indicator.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.MGSR.2.2** Solve mathematical and real-world situations involving dimensions and areas of geometric figures including scale drawings and scale factors.
Indicator Insight	Find the scale factor of similar figures using both the sides and the areas.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • find the scale factor when side lengths are known. • find the scale factor when the areas are known. • scale figures when scale factors are provided. • determine the area when a figure is scaled.
Assessment Guidelines	Include scale drawings and scale factors.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.MGSR.2.3** Identify the relationships and measures among angles formed by two intersecting lines, given the measure of one angle. Limit to supplementary, complementary, vertical, and adjacent relationships.
Indicator Insight	Use given angle measurements to solve for unknown angle measurements.
7.MGSR.2.2	**Assessment Specifications**
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • identify what the relationship is between two angles. • determine the measure of an angle given the measure of another angle and the relationship to the first angle. • identify angles that share a given relationship.
Assessment Guidelines	Students are not expected to solve algebraic expressions/equations. Assessment should focus on supplementary, complementary, vertical, and adjacent relationships. Figures may include more than two intersecting lines, and/or rays.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.MGSR.2.4** Write and solve equations to solve mathematical and real-world situations involving the relationships among angles formed by two intersecting lines. Limit to supplementary, complementary, vertical, and adjacent relationships.
Indicator Insight	Instead of a measurement of the angle, there is an algebraic expression that will be used to find the angle measurement. It is not the expectation of this indicator to have variables on both sides of the equation.
7.MGSR.2.4	**Assessment Specifications**
Example Tasks *(This list is non-exhaustive.)*	The student will be able to • write equations to represent relationships among angles. • solve equations that represent relationships among angles
Assessment Guidelines	Students are not expected to solve problems involving variables on both sides of the equation for this indicator. Assessment should focus on supplementary, complementary, vertical, and adjacent relationships. Figures may include more than two intersecting lines, and/or rays.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 7.MGSR.3

Graph on the coordinate plane.

Math Vocabulary for Assessment: coordinate plane, Quadrant I, II, III, IV, ordered pair, origin, coordinates, x-axis, y-axis, x-coordinate, y-coordinate

Indicator	**7.MGSR.3.1** Find distances between ordered pairs on the coordinate plane, limited to the same x-coordinate or the same y-coordinate.
Indicator Insight	Connect to finding the area and perimeter of polygons by calculating vertical and horizontal distances. Make connections to *absolute value*.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • find the distance between ordered pairs with the same *x*-coordinate in the coordinate plane. • find the distance between ordered pairs with the same *y*-coordinate in the coordinate plane. • plot a point a specific distance from a given point with the same *x*-coordinate or same *y*-coordinate. • determine the perimeter of a rectangle or square where the *x*-coordinates and *y*-coordinates are the same between points.
Assessment Guidelines	Determining the correct response will require an understanding of ordered pairs and distance in the coordinate plane. Limit to points having the same x-coordinate or the same y-coordinate.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Numerical Reasoning (NR)

Standard 7.NR.1

Translate among multiple representations of rational numbers.

Math Vocabulary for Assessment: repeating decimals, bar notation, positive/negative fractions, positive/negative decimals

Indicator	**7.NR.1.1** Convert rational numbers into equivalent forms among fractions (including mixed numbers), decimals, and percentages. Exclude the conversion of repeating decimals to fractions
Indicator Insight	In sixth grade, denominators were limited. There is no limit to denominators in this indicator.
7.NR.1.1	**Assessment Specifications**
Example Tasks *(This list is non-exhaustive.)*	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 not expected to convert repeating decimals to fractions.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 7.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	**7.NR.2.1** Compare two rational numbers and write statements using is equal to (=), is not equal to (≠), is less than (<), is greater than or equal to (≥), and/or is less than or equal to (≤) in mathematical and real-world situations.
Indicator Insight	Include negative rational numbers. Practice placing all rational numbers on a number line.
7.NR.2.1	**Assessment Specifications**
Example Tasks *(This list is non-exhaustive.)*	The student will be able to • compare two rational numbers. • write statements comparing rational numbers using <, >, =, ≤, or ≥. • order rational numbers.
Assessment Guidelines	Assessment should be limited to no more than five rational numbers.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Patterns, Algebra, and Functional Reasoning (PAFR)

Standard 7.PAFR.1

Use tables, graphs, verbal descriptions, or equations to represent a function.

Math Vocabulary for Assessment:
proportional reasoning, proportional relationship, constant of proportionality, function, percentage, markups (percent increase), markdowns (percent decrease), tips, tax, sale, sale price, coupons, discounts, commission, percent error, depreciation, simple interest, gas mileage, population density, unit price, hourly wages

Indicator	**7.PAFR.1.1** Apply proportional reasoning to solve problems in mathematical and real-world situations involving ratios and percentages
Indicator Insight	Use a variety of situations, including, but not limited to, markups (percent increase), markdowns (percent decrease), tips, tax, coupons, discounts, commission, percent error, depreciation, simple interest, speed, unit price, and population density.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • solve problems using proportional reasoning in mathematical or real-world situations. • determine percent change in various situations.
Assessment Guidelines	Students are expected to be familiar with situations involving markups, markdowns, tips, tax, coupons, discounts, commission, percent error, depreciation, simple interest, speed, unit price, population density, etc. All those contexts and terms should be familiar to students.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.PAFR.1.2** Create a model with functions that address a proportional relationship in real-world situations
Indicator Insight	Models should include tables, functions and their graphs, equations, diagrams, and verbal descriptions. Include the use of function notation such as *f(x)* or *g(x)* when working with function tables.
7.PAFR.1.2	**Assessment Specifications**
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • create a model with functions to represent a proportional relationship in a real-world situation. • determine which function is represented by a given model.
Assessment Guidelines	Students are expected to see proportional relationships in various forms including tables, functions, graphs, equations, diagrams, and verbal descriptions.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.PAFR.1.3** Identify the constant of proportionality within proportional relationships.
Indicator Insight	The constant of proportionality is the unit rate. Use tables, graphs, and equations to identify the constant of proportionality. Introduce $y = kx$.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • identify the constant of proportionality for a proportional relationship. • determine which table, graph or equation has a given constant of proportionality.
Assessment Guidelines	Students are expected to view proportional relationships presented as tables, graphs, or equations.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 7.PAFR.2

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

Math Vocabulary for Assessment: multi-step equation, multi-step inequality, like terms, complex fraction (compound fractions)

Indicator	**7.PAFR.2.1** Write and solve multi-step equations and inequalities in one variable involving rational numbers in mathematical and real-world situations.
Indicator Insight	Include a fraction bar as a grouping symbol. Combine like terms, but do not include variables on both sides; one side only
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • write multi-step equations or inequalities. • solve multi-step equations or inequalities. • graph solutions to inequalities on a number line.
Assessment Guidelines	Assessment should focus on one-variable and variables on one side.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.PAFR.2.2** Write and evaluate expressions in one variable that model mathematical and real-world situations.
Indicator Insight	Include all rational numbers when writing and evaluating expressions.
7.PAFR.2.2 Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • write one-variable expressions to model mathematical or real-world situations. • evaluate one-variable expressions that model mathematical or real-world situations.
Assessment Guidelines	Students are expected to see all types of rational numbers.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.PAFR.2.3** Compute unit rates, including those involving complex fractions with like or different units.
Indicator Insight	Introduce complex fractions also known as compound fractions.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to determine the unit rate for a situation.
Assessment Guidelines	Students are expected to solve situations including like or different units and complex fractions.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.PAFR.2.4** Use dimensional analysis to convert units between metric and customary systems.
Indicator Insight	Include problems with measures of mass, weight, length, and liquid. Convert from metric to customary and customary to metric systems.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to • convert units between metric and customary systems. • use dimensional analysis to determine the resulting units in a real-world context.
Assessment Guidelines	Students are provided with a reference sheet for the conversions (see Appendix: Student Reference Sheet). Students are expected to be able to solve problems involving conversions before and after the conversion between measurement systems. Students are expected to be able to solve problems involving more than one conversion between systems as a rate.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Standard 7.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: laws of exponents, Product of Powers, Quotient of Powers, Power of a Power, Power of a Product, Power of a Quotient, Zero Power, Negative Exponent, linear expression, factor, positive/negative fractions, positive/negative decimals

Indicator	**7.PAFR.3.1** Simplify numerical expressions that include integer exponents using the laws of exponents: the Product of Powers, Quotient of Powers, Power of a Power, Power of a Product, Power of a Quotient, Zero Power, and Negative Exponent.
Indicator Insight	Expose students to expressions and models to look for patterns to create a generalization through examples. Provide experiences to discover the rules.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to use the laws of exponents to simplify numerical expressions with integer exponents.
Assessment Guidelines	Students are not expected to simplify algebraic expressions. Assessment should focus on integer exponents. Limit to rules of Product of Powers, Quotient of Powers, Power of a Power, Power of a Product, Power of a Quotient, Zero Power, and Negative Exponent.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.PAFR.3.2** Identify linear expressions that are equivalent.
Indicator Insight	Combine like terms when needed to show equivalence.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to create an equivalent form of a linear expression.
Assessment Guidelines	Equivalent does not mean "in simplified form."
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.PAFR.3.3** Recognize that algebraic expressions may have a variety of equivalent forms and determine an appropriate form for a given real-world situation.
Indicator Insight	Use the context to determine an equivalent expression that best matches the situation. Know that there can be multiple forms of the same expression.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to determine the appropriate form of an expression for a given real-world situation.
Assessment Guidelines	Test items may involve defining more than one variable within the context of the problem. Use all types of rational numbers.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.PAFR.3.4** Factor linear expressions with integer coefficients using the greatest common factor (GCF).
Indicator Insight	Students learned GCF in fifth grade.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to factor linear expressions with integer coefficients.
Assessment Guidelines	Students are expected to work with a variable in the linear expressions to expand on GCF from 5th grade.
DOK(s)	1, 2
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Indicator	**7.PAFR.3.5** Apply all operations with rational numbers to solve problems in mathematical and real-world situations.
Indicator Insight	Include positive and negative fractions and decimals. Develop generalizations through multiple examples with models to find patterns.
Assessment Specifications	
Example Tasks *(This list is non-exhaustive.)*	Students will be able to solve problems in mathematical and real-world situations.
Assessment Guidelines	Students are expected to be able to solve problems involving all rational numbers and all four operations. No limitations on denominators.
DOK(s)	1, 2, 3
Item Types	Selected-Response Technology-Enhanced Technology-Enhanced Constructed-Response

Appendix: Student Reference Sheet

Grade 7 students may use a reference sheet of appropriate conversions while taking SC READY. The reference sheet is available in the online testing system for online testers and as a paper supplement for paper testers. All SC READY Mathematics reference sheets can be found on the Quick Links for Teachers page on the SCDE website. Click the image below to access the PDF version.

SC READY Mathematics Reference Sheet

Grade 7

Conversions	
Metric	**Customary**
1 centimeter = 10 millimeters 1 meter = 100 centimeters 1 kilometer = 1,000 meters	1 foot = 12 inches 1 yard = 3 feet 1 mile = 5,280 feet
1 centiliter = 10 milliliters 1 liter = 100 centiliters 1 kiloliter = 1,000 liters	1 cup = 8 fluid ounces 1 pint = 2 cups 1 quart = 2 pints 1 gallon = 4 quarts
1 centigram = 10 milligrams 1 gram = 100 centigrams 1 kilogram = 1,000 grams	1 pound = 16 ounces 1 ton = 2,000 pounds

Time
60 seconds = 1 minute 60 minutes = 1 hour

Approximate Conversions		
Metric	**to**	**Customary**
2.54 centimeter	=	1 inch
1.609 kilometer	≈	1 mile
0.946 liter	≈	1 quart
4.929 milliliter	≈	1 teaspoon
0.454 kilogram	≈	1 pound
1.609 kilometers per hour	≈	1 miles per hour