Mathematics

Grade 7

PA Alternate Eligible Content

PA Reporting Category: M07.A-N The Number System

PA Core Standards:
CC.2.1.7.E.1 Apply and extend previous understandings of operations with fractions to operations with rational numbers.

Assessment Anchor
M07.A-N.1 Apply and extend previous understandings of operations to add, subtract, multiply, and divide rational numbers.

DESCRIPTOR	ELIGIBLE CONTENT	Alternate Eligible Content Code	ALTERNATE ELIGIBLE CONTENT
M07.A-N.1.1 **Solve real-world and mathematical problems involving the four operations with rational numbers.**	**M07.A-N.1.1.1** **Apply properties of operations to add and subtract rational numbers, including real-world contexts.**	**M07AN1.1.1a**	**Solve a 1-step addition or subtraction problem with fractions, decimals, or positive/negative integers**
	M07.A-N.1.1.2 **Represent addition and subtraction on a horizontal or vertical number line.**	**M07AN1.1.2a**	**Identify the difference between two numbers on the number line**
	M07.A-N.1.1.3 **Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats.**	**M07AN1.1.3a**	**Solve a multiplication or division problem with positive/negative rational numbers**

PA Reporting Category: M07.A-R Ratios and Proportional Relationships

PA Core Standards:
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

Assessment Anchor
M07.A-R.1 Demonstrate an understanding of proportional relationships.

DESCRIPTOR	ELIGIBLE CONTENT	Alternate Eligible Content Code	ALTERNATE ELIGIBLE CONTENT
M07.A-R.1.1 **Analyze, recognize, and represent proportional relationships and use them to solve real-world and mathematical problems.**	**M07.A-R.1.1.1** **Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.** **Example: If a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2 / 1/4 miles per hour, equivalently 2 miles per hour.**	**M07AR1.1.1a**	**Find the unit rate in a real-world problem**
	M07.A-R.1.1.2 **Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, graphing on a coordinate plane and observing whether the graph is a straight line through the origin).**		
	M07.A-R.1.1.3 **Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.**	**M07AR1.1.3a**	**Represent a proportional relationship on a line graph**
	M07.A-R.1.1.4 **Represent proportional relationships by equations.** **Example: If total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.**		
	M07.A-R.1.1.5 **Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r), where r is the unit rate.**	**M07AR1.1.5a**	**Interpret an ordered pair in a real-world problem**
	M07.A-R.1.1.6 **Use proportional relationships to solve multi-step ratio and percent problems.** **Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease.**	**M07AR1.1.6a**	**Use percentages to solve a real-world problem**

PA Reporting Category: M07.B-E Expressions and Equations

PA Core Standards:
CC.2.2.7.B.1 Apply properties of operations to generate equivalent expressions.

Assessment Anchor
M07.B-E.1 Represent expressions in equivalent forms.

DESCRIPTOR	ELIGIBLE CONTENT	Alternate Eligible Content Code	DRAFT ALTERNATE ELIGIBLE CONTENT
M07.B-E.1.1 **Use properties of operations to generate equivalent expressions.**	**M07.B-E.1.1.1** **Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients.** **Example 1: The expression 1/2 • (x + 6) is equivalent to 1/2 • x + 3.** **Example 2: The expression 5.3 – y + 4.2 is equivalent to 9.5 – y (or –y + 9.5).** **Example 3: The expression 4w – 10 is equivalent to 2(2w – 5).**		

PA Reporting Category: M07.B-E Expressions and Equations

PA Core Standards:

CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Assessment Anchor

M07.B-E.2 Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities.

DESCRIPTOR	ELIGIBLE CONTENT	Alternate Eligible Content Code	ALTERNATE ELIGIBLE CONTENT
M07.B-E.2.1 **Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers.**	**M07.B-E.2.1.1** **Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.** **Example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50 an hour (or 1.1 × $25 = $27.50).**		
M07.B-E.2.2 **Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems.**	**M07.B-E.2.2.1** **Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers.** **Example: The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?**	**M07BE2.2.1a**	**Select an algebraic expression (equations or inequalities) using addition or subtraction of fractions, decimals, or positive/negative integers to solve a 1-step real-world problem**
	M07.B-E.2.2.2 **Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers, and graph the solution set of the inequality.** **Example: A salesperson is paid $50 per week plus $3 per sale. This week she wants her pay to be at least $100. Write an inequality for the number of sales the salesperson needs to make and describe the solutions.**		
M07.B-E.2.3 **Determine the reasonableness of the answer(s) in problem- solving situations.**	**M07.B-E.2.3.1** **Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem.** **Example: If you want to place a towel bar that is 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.**	**M07BE2.3.1a**	**Identify a reasonable solution in the context of a problem using the four basic operations and numbers under 20**

PA Reporting Category: M07.C-G Geometry

PA Core Standards:
CC.2.3.7.A.2 Visualize and represent geometric figures and describe the relationships between them.

Assessment Anchor
M07.C-G.1 Demonstrate an understanding of geometric figures and their properties.

DESCRIPTOR	ELIGIBLE CONTENT	Alternate Eligible Content Code	DRAFT ALTERNATE ELIGIBLE CONTENT
M07.C-G.1.1 **Describe and apply properties of geometric figures.**	**M07.C-G.1.1.1** **Solve problems involving scale drawings of geometric figures, including finding length and area.**	**M07CG1.1.1a**	**Solve a 1-step real-world problem related to scaling**
	M07.C-G.1.1.2 **Identify or describe the properties of all types of triangles based on angle and side measures.**	**M07CG1.1.2a**	**Identify the properties of a right triangle**
	M07.C-G.1.1.3 **Use and apply the triangle inequality theorem.**		
	M07.C-G.1.1.4 **Describe the two-dimensional figures that result from slicing three-dimensional figures.** **Example: Describe plane sections of right rectangular prisms and right rectangular pyramids.**	**M07CG1.1.4a**	**Identify a three-dimensional figure with specific attributes**

PA Reporting Category: M07.C-G Geometry

PA Core Standards:
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

Assessment Anchor
M07.C-G.2 Solve real-world and mathematical problems involving angle measure, circumference, area, surface area, and volume.

DESCRIPTOR	ELIGIBLE CONTENT	Alternate Eligible Content Code	ALTERNATE ELIGIBLE CONTENT
M07.C-G.2.1 **Identify, use, and describe properties of angles and their measures.**	**M07.C-G.2.1.1** **Identify and use properties of supplementary, complementary and adjacent angles in a multi- step problem to write and solve simple equations for an unknown angle in a figure.**	**M07CG2.1.1a**	**Use angle relationships to find the missing angle**
	M07.C-G.2.1.2 **Identify and use properties of angles formed when two parallel lines are cut by a transversal (e.g., angles may include alternate interior, alternate exterior, vertical, corresponding).**		
M07.C-G.2.2 **Determine circumference, area, surface area, and volume**	**M07.C-G.2.2.1** **Find the area and circumference of a circle. Solve problems involving area and circumference of a circle(s). Formulas will be provided.**		
	M07.C-G.2.2.2 **Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. Formulas will be provided.**	**M07CG2.2.2a**	**Find the area or volume of a two- or three-dimensional object given the formula**

PA Reporting Category: M07.D-S Statistics and Probability

PA Core Standards:
CC.2.4.7.B.1 Draw inferences about populations based on random sampling concepts.

Assessment Anchor
M07.D-S.1 Use random sampling to draw inferences about a population.

DESCRIPTOR	ELIGIBLE CONTENT	Alternate Eligible Content Code	ALTERNATE ELIGIBLE CONTENT
M07.D-S.1.1 **Use random samples.**	**M07.D-S.1.1.1** **Determine whether a sample is a random sample given a real-world situation.**		
	M07.D-S.1.1.2 **Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.** **Example 1: Estimate the mean word length in a book by randomly sampling words from the book.** **Example 2: Predict the winner of a school election based on randomly sampled survey data.**		

PA Reporting Category: M07.D-S Statistics and Probability

PA Core Standards:
CC.2.4.7.B.2 Draw informal comparative inferences about two populations.

Assessment Anchor
M07.D-S.2 Draw comparative inferences about populations.

DESCRIPTOR	ELIGIBLE CONTENT	Alternate Eligible Content Code	ALTERNATE ELIGIBLE CONTENT
M07.D-S.2.1 **Use statistical measures to compare two numerical data distributions.**	**M07.D-S.2.1.1** **Compare two numerical data distributions using measures of center and variability.** **Example 1: The mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team. This difference is equal to approximately twice the variability (mean absolute deviation) on either team. On a line plot, note the difference between the two distributions of heights.** **Example 2: Decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth- grade science book.**	**M07DS2.1.1a**	**Compare two sets of data within a single pictograph, line plot, or bar graph**
		M07DS2.1.1b	**Use measures of central tendency to interpret data, including overall patterns in the data**

PA Reporting Category: M07.D-S Statistics and Probability

PA Core Standards:
CC.2.4.7.B.3 Investigate chance processes and develop, use, and evaluate probability models.

Assessment Anchor
M07.D-S.3 Investigate chance processes and develop, use, and evaluate probability models.

DESCRIPTOR	ELIGIBLE CONTENT	Alternate Eligible Content Code	ALTERNATE ELIGIBLE CONTENT
M07.D-S.3.1 **Predict or determine the likelihood of outcomes.**	**M07.D-S.3.1.1** **Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (i.e., a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event).**	**M07DS3.1.1a**	**Identify the probability of events occurring as possible/impossible or likely/unlikely**
M07.D-S.3.2 **Use probability to predict outcomes**	**M07.D-S.3.2.1** **Determine the probability of a chance event given relative frequency. Predict the approximate relative frequency given the probability.** **Example: When rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times but probably not exactly 200 times.**		
	M07.D-S.3.2.2 **Find the probability of a simple event, including the probability of a simple event not occurring.** **Example: What is the probability of not rolling a 1 on a number cube?**		
	M07.D-S.3.2.3 **Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation.**		