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

## 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 <br> Analyze, recognize, and represent proportional relationships and use them to solve real-world and mathematical problems. | M07.A-R.1.1.1 <br> 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 $1 / 2$ I $1 / 4$ 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 <br> 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 <br> 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 <br> 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 $t=p n$. |  |  |
|  | M07.A-R.1.1.5 <br> 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 <br> Use proportional relationships to solve multi-step ratio and percent problems. <br> 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 <br> Use properties of operations to generate equivalent expressions. | M07.B-E.1.1.1 <br> Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients. <br> Example 1: The expression $1 / 2 \cdot(x+6)$ is equivalent to $1 / 2 \cdot x+3$. <br> Example 2: The expression $5.3-\mathrm{y}+4.2$ is equivalent to $9.5-\mathrm{y}$ (or $-\mathrm{y}+9.5$ ). <br> Example 3: The expression $4 w-10$ is equivalent to $2(2 w-5)$. |  |  |

## 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 <br> Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers. | M07.B-E.2.1.1 <br> Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. <br> 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 $\mathbf{\$ 2 . 5 0}$, for a new salary of $\mathbf{\$ 2 7 . 5 0}$ an hour (or $1.1 \times \$ 25=\$ 27.50$ ). |  |  |
| M07.B-E.2.2 <br> 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 <br> Solve word problems leading to equations of the form $p x+q=r$ and $p(x+q)=r$, where $p, q$, and $r$ are specific rational numbers. <br> 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 <br> Solve word problems leading to inequalities of the form $p x+q>r$ or $p x+q<r$, where $p$, $q$, and $r$ are specific rational numbers, and graph the solution set of the inequality. <br> 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 <br> Determine the reasonableness of the answer(s) in problem- solving situations. | M07.B-E.2.3.1 <br> Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem. <br> 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 <br> Describe and apply properties of geometric figures. | M07.C-G.1.1.1 <br> 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 <br> 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 <br> Use and apply the triangle inequality theorem. |  |  |
|  | M07.C-G.1.1.4 <br> Describe the two-dimensional figures that result from slicing three-dimensional figures. <br> 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 <br> Content Code | ALTERNATE ELIGIBLE CONTENT |
| :--- | :--- | :--- | :--- |
| M07.C-G.2.1 <br> Identify, use, and describe <br> properties of angles and their <br> measures. | M07.C-G.2.1.1 <br> Identify and use properties of supplementary, <br> complementary and adjacent angles in a multi- step <br> problem to write and solve simple equations for an <br> unknown angle in a figure. | M07CG2.1.1a <br> missing angle |  |
|  | M07.C-G.2.1.2 <br> Identify and use properties of angles formed when <br> two parallel lines are cut by a transversal (e.g., <br> angles may include alternate interior, alternate <br> exterior, vertical, corresponding). |  |  |
| M07.C-G.2.2 <br> Determine circumference, area, <br> surface area, and volume | M07.C-G.2.2.1 <br> Find the area and circumference of a circle. Solve <br> problems involving area and circumference of a <br> circle(s). Formulas will be provided. |  | Find the area or volume of a two- or <br> three-dimensional object given the <br> formula |
|  | M07.C-G.2.2.2 <br> Solve real-world and mathematical problems <br> involving area, volume, and surface area of two- and <br> three-dimensional objects composed of triangles, <br> quadrilaterals, polygons, cubes, and right prisms. <br> Formulas will be provided. | M07CG2.2.2a |  |

## 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 <br> Content Code | ALTERNATE ELIGIBLE CONTENT |
| :--- | :--- | :--- | :--- |
| M07.D-S.1.1 <br> Use random samples. | M07.D-S.1.1.1 <br> Determine whether a sample is a random sample <br> given a real-world situation. |  |  |
|  | M07.D-S.1.1.2 <br> Use data from a random sample to draw inferences <br> about a population with an unknown characteristic <br> of interest. <br> Example 1: Estimate the mean word length in a <br> book by randomly sampling words from the book. <br> Example 2: Predict the winner of a school election <br> 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 <br> Content Code | ALTERNATE ELIGIBLE CONTENT |
| :--- | :--- | :--- | :--- |
| M07.D-S.2.1 <br> Use statistical measures to <br> compare two numerical data <br> distributions.M07.D-S.2.1.1 <br> Compare two numerical data distributions using <br> measures of center and variability. <br> Example 1: The mean height of players on the <br> basketball team is 10 cm greater than the mean <br> height of players on the soccer team. This <br> difference is equal to approximately twice the <br> variability (mean absolute deviation) on either team. <br> On a line plot, note the difference between the two <br> distributions of heights. <br> Example 2: Decide whether the words in a chapter <br> of a seventh-grade science book are generally <br> longer than the words in a chapter of a fourth- grade <br> science book. | Compare two sets of data within a single <br> pictograph, line plot, or bar graph | M07DS2.1.1b | Use measures of central tendency to <br> interpret data, including overall patterns <br> 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 <br> Content Code | ALTERNATE ELIGIBLE CONTENT |
| :--- | :--- | :--- | :--- |
| M07.D-S.3.1 <br> Predict or determine the <br> likelihood of outcomes. | M07.D-S.3.1.1 <br> Predict or determine whether some outcomes are <br> certain, more likely, less likely, equally likely, or <br> impossible (i.e., a probability near 0 indicates an <br> unlikely event, a probability around 1/2 indicates an <br> event that is neither unlikely nor likely, and a <br> probability near 1 indicates a likely event). | M07DS3.1.1a | Identify the probability of events <br> occurring as possible/impossible or <br> likely/unlikely |
| M07.D-S.3.2 <br> Use probability to predict <br> outcomes | M07.D-S.3.2.1 <br> Determine the probability of a chance event given <br> relative frequency. Predict the approximate relative <br> frequency given the probability. <br> Example: When rolling a number cube 600 times, <br> predict that a 3 or 6 would be rolled roughly 200 <br> times but probably not exactly 200 times. |  |  |
|  | M07.D-S.3.2.2 <br> Find the probability of a simple event, including the <br> probability of a simple event not occurring. <br> Example: What is the probability of not rolling a 1 <br> on a number cube? |  |  |
|  | M07.D-S.3.2.3 <br> Find probabilities of independent compound events <br> using organized lists, tables, tree diagrams, and <br> simulation. |  |  |

