

**Virginia Standards of Learning Assessment
Grade 6 Mathematics Performance Level Descriptors**

Fail/Below Basic	Fail/Basic	Pass/Proficient	Pass/Advanced
<p>A student performing at this level should be able to:</p> <ul style="list-style-type: none"> • Define ratio as the comparison of two quantities. • Use a shading grid to represent numbers in fraction, decimal, or percent form. • Identify positive and negative numbers, and identify powers of ten by recognizing patterns. • Identify multiplication and division of whole numbers using manipulatives. • Add and subtract fractions with like denominators, and multiply and divide whole numbers using concrete materials. • Define the order of operations as the process used in simplifying expressions. • Recognize the U.S. Customary System and the metric system as the two measurement conventions used. 	<p>A student performing at this level should be able to:</p> <ul style="list-style-type: none"> • Recognize ratios using fractions, colons, or the word <i>to</i>, and describe the equivalent relationship between decimals, fractions, and percents, written and verbally. • Identify and represent integers on a number line. • Identify and represent the absolute value of whole numbers. • Use models and repeated addition or subtraction to identify multiplication and division of fractions; add and subtract fractions with denominators limited to 12; and multiply fractions in simplest form. • Identify the base and exponent of an exponential expression, and use repeated multiplication to represent the expression. • Use manipulatives to identify perfect squares. 	<p>A student performing at this level should be able to:</p> <ul style="list-style-type: none"> • Use appropriate notation to compare and describe data sets using ratios as part-part, part-whole, whole-whole. • Compare, order, and represent equivalent relationships between decimals, fractions, and percents using various representations and symbols. • Identify, represent, order, and compare integers, and identify and describe the absolute value of integers. • Use multiple representations to model the product and quotient of fractions and mixed numbers. • Use the order of operations to estimate, simplify, or solve single and multistep problems, which apply the four operations to fractions, mixed numbers, and decimals. 	<p>A student performing at this level should be able to:</p> <ul style="list-style-type: none"> • Create a relationship in words for a given ratio expressed symbolically, and recognize ratios represented in simplest form. • Use estimation strategies and a variety of techniques to compare, order, and represent equivalent relationships between decimals, fractions, and percents. • Describe the use of negative numbers in practical situations. • Explain the usefulness of a number line in comparing and ordering integers and describing the concept of absolute value. • Use multiple representations to illustrate multiplication and division of fractions. • Describe how fraction multiplication and division models relate to the algorithm.

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<ul style="list-style-type: none"> • Define 3.14 and $\frac{22}{7}$ as an approximation for pi. • Graph integers on a number line. • Name the x-axis and y-axis. • Find the perimeter of a labeled figure; identify rectangles, squares, and parallelograms; and use measurement tools to construct congruent figures. • Identify bar graphs, line graphs, and circle graphs. • Define mean as the numerical average. • Recognize probability as a ratio between zero and one. • Define geometric and arithmetic sequences. • Describe a mathematical expression as an expression that contains variables, numbers, terms, and/or operation symbols that represents a mathematical relationship. • Identify the sum of zero and a number is the number, the product of one and a number is the number, and the product of zero and a number is zero. 	<ul style="list-style-type: none"> • Add and subtract fractions with like denominators, and multiply proper fractions. • Simplify whole number numerical expressions that contain addition and subtraction. • Measure objects using the U.S. Customary System or the metric system. • Identify elements of a circle, and define pi as the ratio of the circumference and diameter of a circle. • Apply formulas to problems involving area and perimeter of triangles and rectangles. • Name the four quadrants of a coordinate plane, and identify the coordinates of a point. • Classify quadrilaterals using pictorial representations, and verify the congruence of shapes using labeled measures or by placing one figure on top of the other. • Determine the best graph to represent data. • Describe the three measures of center. 	<ul style="list-style-type: none"> • Use estimation strategies to predict solutions for multistep practical problems. • Solve multistep practical problems involving addition, subtraction, multiplication and division of fractions and mixed numbers. • Represent exponential expressions and repeated multiplication in equivalent form. • Describe the concept of perfect squares, representing them with manipulatives. • Apply the order of operations to simplify single-step expressions with whole numbers. • Recognize the application of the additive and multiplicative identity property, multiplicative property of zero, and the multiplicative inverse property to simplify expressions using the order of operations. • Solve practical problems involving the circumference and area of circles using the radius or diameter and the definition of pi. • Solve practical problems involving area and perimeter of polygons, and find the surface area and volume of rectangular prisms. 	<ul style="list-style-type: none"> • Represent exponential expressions and repeated multiplication in equivalent form, and explain the relationship between a perfect square and its geometric square. • Create and solve multistep practical problems involving addition, subtraction, multiplication, and division of fractions and mixed numbers, presenting answers in simplest form. • Apply the order of operations to simplify multistep expressions with whole numbers. • Describe the expected product of multiplying fractions by whole numbers, fractions by fractions, and fractions by whole numbers. • Estimate measurements by comparing the object to be measured against a benchmark. • Create and solve practical problems involving circumference and area of a circle. • Verify the formulas and create and solve problems for area and perimeter of a square and rectangle, and surface area and volume of a rectangular prism.

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<ul style="list-style-type: none"> • Use inequality symbols to represent the relationship between integers. 	<ul style="list-style-type: none"> • Represent mean as fair share. • Calculate the probability of a single event. • Determine the common difference or common ratio for arithmetic or geometric sequences. • Use manipulatives to solve one-step equations involving whole numbers. • Describe the solution set to an inequality as the set of all numbers that make the inequality true. • Identify additive and multiplicative identities, and the multiplicative property of zero. 	<ul style="list-style-type: none"> • Use ballpark comparisons between the U.S. Customary System and metric system to estimate measurement. • Use coordinates to graph and identify points on the coordinate plane, and assign points to the correct quadrant or axis without graphing. • Use attributes to classify quadrilaterals and to determine congruence of segments, angles, and polygons. • Construct circle graphs to draw conclusions and make predictions, and recognize multiple graphical representations of the same data set. • Describe the best measure of central tendency for a given set of data, and use a number line to define the mean as balance point. • Determine if two events are dependent or independent, and find the probability of two dependent or independent events occurring. • Identify geometric and arithmetic sequences, and extend a given sequence. 	<ul style="list-style-type: none"> • Graph points on a coordinate plane, and relate the coordinates of a point to the x- and y-axis and other points. • Compare, describe, and make inferences about the relationship between two congruent polygons. • Classify quadrilaterals into subsets using attributes, and make inferences about the relationship between two congruent polygons. • Collect, organize and display data in circle graphs, draw conclusions, make predictions, and compare and contrast other types of graphs that represent the same data. • Determine appropriate measure of center to analyze the dispersion and interpretation of data. • Simulate and analyze independent and dependent events given multiple situations. • Develop a symbolic representation to extend geometric and arithmetic sequences.

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		<ul style="list-style-type: none"> • Solve one-step linear equations in one variable involving whole number coefficients and positive rational solutions. • Graph inequalities on a number line. • Identify a real number equation that represents: additive and multiplicative identities, the multiplicative property of zero, and the multiplicative inverse. 	<ul style="list-style-type: none"> • Solve one-step linear equations in one variable involving whole number coefficients and positive rational solutions, and explain the rationale for performing the same operation to both sides of an equation. • Translate between the graphical and symbolic representation of an inequality. • Explain the validity of the additive and multiplicative identities, the multiplicative property of zero, and the multiplicative inverse when evaluating real number expressions.