Virginia Standards of Learning Assessment
Grade 8 Mathematics Performance Level Descriptors

Fail/Below Basic	Fail/Basic	Pass/Proficient	Pass/Advanced
A student performing at this level should be able to: • Apply the order of operations to simple expressions and recognize properties of real numbers. • Compare and order decimals. • Identify natural numbers, counting numbers, and whole numbers. • Solve equations with whole numbers. • Simplify simple algebraic expressions using manipulatives. • Use manipulatives to recognize perfect squares. • Define and recognize complementary, supplementary, right, and straight angles. • Use manipulatives to demonstrate reflections and translations of polygons.	A student performing at this level should be able to: • Apply the order of operations to simple expressions, substitute numbers for variables in algebraic expressions, and define the properties of real numbers. • Compare and order fractions, decimals, and percents. • Identify natural numbers, counting numbers, whole numbers, and rational numbers in fraction form. • Solve equations involving rational numbers, percents, and ratios. • Simplify simple algebraic expressions for given replacement values. • Determine whether a given number is a perfect square.	A student performing at this level should be able to: • Apply the order of operations and properties of operations with real numbers to simplify numerical expressions involving positive exponents and rational numbers. • Compare and order decimals, fractions, percents, and numbers written in scientific notation. • Identify each subset of the real number system, and describe the classification to which a number belongs. • Solve practical problems involving rational numbers, percents, ratios, and proportions, given percent increase or decrease. • Evaluate algebraic expressions with given replacement values.	A student performing at this level should be able to: • Use the order of operations and properties of real numbers to determine and justify the solutions and the steps used to solve multistep expressions, multistep practical problems, and formulas involving rational numbers, square roots, and positive exponents. • Compare and order no more than five fractions, decimals, percents, and numbers written in scientific notation using positive and negative exponents in ascending or descending order. • Describe each subset of real numbers and discriminate between an example and non-example of a number in a given subset.

Fail/Below Basic	Fail/Basic	Pass/Proficient	Pass/Advanced
• Use manipulatives to describe the sides of a three-dimensional figure. • Define the Pythagorean Theorem. • Find area of squares, triangles, and circles. • Determine simple probability. • Describe information displayed in a variety of graphs. • Name the dependent and independent variables in a scatterplot. • Make connections between tables and ordered pairs. • Solve single-step linear equations in one variable with the variable on one side of the equation. • Graph a simple inequality on a number line. • Graph ordered pairs on a coordinate plane, and connect the points to form a straight line.	• Recognize vertical, adjacent, supplementary, and complementary angles, and identify measures for right and straight angles. • Find the volume of a rectangular prism. • Recognize translations, reflections, rotations, and dilations on a coordinate plane. • Identify a three-dimensional model given a two-dimensional perspective. • Apply the Pythagorean Theorem when the hypotenuse is unknown. • Find the area of squares, triangles, and parallelograms. • Determine the probability of two independent events; and define a dependent event. • Make comparisons about information displayed in various graphical representations. • Represent data presented in a table using a scatterplot.	• Generate a list of perfect squares and find the two consecutive whole numbers between which a square root lies. • Describe and verify angle relationships among vertical, adjacent, supplementary, and complementary angles. • Investigate and solve practical problems involving volume and surface area of prisms, cylinders, cones, and pyramids, and describe how changing one measured attribute of the figure affects the volume and surface area. • Apply transformations to plane figures, and identify applications of transformations. • Construct a three-dimensional model, given the top or bottom, side and front views. • Verify the Pythagorean Theorem and apply it to find any missing side of a right triangle. • Solve practical problems involving area and perimeter involving composite plane figures.	• Solve practical problems involving multistep linear equations and proportions, and determine the original price, given the percent increase or decrease and the formula. • Evaluate algebraic expressions with given replacement values. • Determine the positive and negative roots of perfect squares, and explain how the area of a square relates to the square root of a number. • Use the angle relationships among vertical, adjacent, supplementary, and complementary angles to solve practical problems, and measure angles less than 360 degrees. • Solve practical problems of polyhedrons using nets. • Distinguish between differences and similarities of volume and area formulas for prisms, cylinders, cones, and pyramids, and determine whether a situation is an application of surface area or volume.

Fail/Below Basic	Fail/Basic	Pass/Proficient	Pass/Advanced
• Identify the additive and multiplicative identities. • Define domain and range.	• Make connections between graphs and tables. • Solve single-step linear equations in one variable, where the variable is on either side. • Solve and graph simple inequalities with whole numbers on a number line. • Identify the distributive, associative, commutative, additive identity, and multiplicative identity properties. • Graph linear equations in two variables given a table of values. • Determine the independent and dependent variables given a set of ordered pairs or a table of values.	• Determine the probability of independent and dependent events, with and without replacement. • Make comparisons, predictions, and inferences about information displayed in various graphical representations. • Collect, organize, and interpret a data set using scatterplots. • Make connections between any two representations given tables, graphs, words, or rules. • Solve multistep linear equations in one variable, where the variable is on both sides. • Solve and graph two-step linear inequalities in one variable. • Identify properties used to solve the equation. • Identify the distributive, associative, commutative, additive identity, multiplicative identity, additive inverse, and multiplicative inverse properties.	• Describe how changing one measured attribute of the figure affects the volume and surface area, and determine whether a situation is an application of surface area or volume. • Apply transformations to plane figures; explain how the transformation of a figure on the coordinate grid affects the congruency, orientation, location and symmetry of an image; and identify practical applications of transformations. • Solve practical problems by applying the Pythagorean Theorem to find any missing side of a right triangle, and verify the Pythagorean Theorem. • Estimate the area and perimeter of a composite figure by subdividing the polygon into plane figures and finding the sum of their estimated areas and perimeters. • Construct a three-dimensional model, given the top or bottom, side and front views.

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		• Graph a linear equation in two variables, given a table of values. • Identify examples of the domain, range, independent variable or dependent variable in a given situation.	• Determine the probability of events with and without replacement, and compare the outcomes of these events. • Construct a scatterplot to interpret the set of data points as having a positive, negative or no relationship and determine line of best fit. • Relate and compare different representations for the same relation. • Solve single variable multistep linear equations, with the variable on either side of the equation. • Solve and graph a linear equation in two variables and use the graph to describe a practical situation. • Solve and graph two-step linear inequalities, and explain the difference between the solutions for an equation and an inequality. • Use the properties of operations to verify the steps used to solve equations.

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			• Explain the relationship between the independent and dependent variables.