**Virginia Standards of Learning Assessment**

**Grade 8 Mathematics (2016 SOL) Performance Level Descriptors**

| **Fail/Below Basic**  | **Fail/Basic**  | **Pass/Proficient**  | **Pass/Advanced**  |
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| A student performing at this level should be able to:*Reporting Category 1: Number, Number Sense, Computation, and Estimation** compare fractions and decimals
* identify natural numbers, whole numbers, and integers
* use manipulatives to recognize perfect squares
* solve practical problems involving fractions, decimals, and integers

*Reporting Category 2: Measurement and Geometry** define and recognize acute, obtuse, right, and straight angles
* determine the areas of circles, triangles, and rectangles
* determine the volume/surface area of a rectangular prism given a labeled figure
* identify the image of a polygon resulting from a single transformation
* use manipulatives to describe the views (top/front/side) of a three-dimensional figure
* define the Pythagorean Theorem

*Reporting Category 3: Probability, Statistics, Patterns, Functions, and Algebra** determine the probability of a simple event
* name the dependent and independent variables represented in a scatterplot
* apply the order of operations to numerical expressions
* simplify algebraic expressions using manipulatives
* define domain and range
* recognize the slope of a linear function as positive, negative, or zero
* make connections between tables and ordered pairs
* represent two-step linear equations using pictorial representations
* solve and graph one-step linear inequalities
 | A student performing at this level should be able to:*Reporting Category 1: Number, Number Sense, Computation, and Estimation** compare and order rational numbers
* identify natural numbers, whole numbers, and integers
* determine the positive square root of a perfect square
* solve practical problems involving rational numbers, percents, and proportions

*Reporting Category 2: Measurement and Geometry** recognize and determine supplementary and complementary angles
* determine the volume and surface area of cones and square based pyramids
* identify and apply translations and reflections of right triangles and rectangles
* identify a 3D model given 2D views
* label hypotenuse and legs of a right triangle
* apply the Pythagorean Theorem when the hypotenuse is unknown
* identify polygons in composite figures and calculate their area and perimeter

*Reporting Category 3: Probability, Statistics, Patterns, Functions, and Algebra** determine probability of two independent events
* define a dependent event
* represent data in boxplots and scatterplots
* apply order of operations
* simplify algebraic expressions
* determine independent and dependent variables from ordered pairs or a table of values
* identify the slope and *y*-intercept of an equation in *y = mx + b* form
* graph linear equations given a table
* make connections between graphs and tables
* solve two-step linear equations
* solve and graph two-step linear inequalities.
 | A student performing at this level should be able to:*Reporting Category 1: Number, Number Sense, Computation, and Estimation** compare and order real numbers
* classify numbers belonging to subsets of real numbers
* compute percent increase and percent decrease
* determine between which two integers a square root lies
* solve practical consumer application problems

*Reporting Category 2: Measurement and Geometry** describe relationships among angles
* solve practical problems involving volume and surface area of cones and pyramids
* describe effect of changing one attribute of rectangular prism
* apply transformations to polygons
* construct 3D models from 2D views
* apply Pythagorean Theorem to determine the unknown side of a right triangle
* determine the area and perimeter of composite figures

*Reporting Category 3: Probability, Statistics, Patterns, Functions, and Algebra** determine probability of two independent and dependent events
* make inferences from boxplots
* construct scatterplots to determine line of best fit
* evaluate algebraic expressions
* determine domain/range and if a function exists
* determine the independent and dependent variable from practical linear situations
* identify slope and *y*-intercept given a table and graph
* graph linear equations in

*y = mx + b* form* make connections among various forms of linear functions
* graph and solve multistep linear equations and inequalities
 | A student performing at this level should be able to:*Reporting Category 1: Number, Number Sense, Computation, and Estimation** describe differences among and discriminate between numbers in the subsets of real numbers
* solve practical problems involving simple interest and new balance of investments and loans

*Reporting Category 2: Measurement and Geometry** solve practical problems involving angle relationships
* solve practical problems involving surface area and volume problems with cones and pyramids
* describe how changing one dimension of a rectangular prism affects volume and surface area
* describe how transformation affects congruency, orientation, location, and symmetry of an image
* identify and generate practical applications of transformations
* solve problems using Pythagorean Theorem
* apply perimeter, circumference, and area formulas to solve practical problems involving composite figures

*Reporting Category 3: Probability, Statistics, Patterns, Functions, and Algebra** compare and contrast probability of independent and dependent events
* compare and analyze two data sets using boxplots
* compare different representations of the same relation
* differentiate between independent and dependent variables
* write a linear equation given slope and *y*-intercept or a practical linear situation
* solve practical problems involving multistep linear equations and inequalities
* differentiate between the solution of an equation and solutions of an inequality
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