

**Virginia Standards of Learning Assessment
Grade 8 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> <p><i>Reporting Category 1: Number, Number Sense, Computation, and Estimation</i></p> <ul style="list-style-type: none"> • compare fractions, decimals, percents, or numbers written in scientific notation • identify the location of rational numbers on a number line • identify between which two natural numbers a square root lies • identify natural numbers and whole numbers 	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 1: Number, Number Sense, Computation, and Estimation</i></p> <ul style="list-style-type: none"> • compare and order rational numbers • identify examples of subsets of the real number system • classify natural numbers, whole numbers, and integers • solve contextual problems involving sales tax or tip and resulting total 	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 1: Number, Number Sense, Computation, and Estimation</i></p> <ul style="list-style-type: none"> • compare and order no more than five real numbers • classify numbers belonging to subsets of the real number system • identify examples or non-examples of subsets of the real number system • illustrate relationships among subsets of the real number system • estimate and solve contextual problems involving: <ul style="list-style-type: none"> ○ sales tax, tip, and resulting total 	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 1: Number, Number Sense, Computation, and Estimation</i></p> <ul style="list-style-type: none"> • justify the approximation of a positive square root for non-perfect square • justify the order and placement of real numbers on a number line, including positive and negative square roots of values up to 400 • describe differences among and between subsets of the real number system, including examples and non-examples

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		<ul style="list-style-type: none">○ one discount or markup and resulting sale price○ percent increase or percent decrease	

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<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 2: Measurement and Geometry</i></p> <ul style="list-style-type: none"> • determine the volume of a rectangular prism given a labeled figure • determine the volume of a cone given the radius and height in a diagram • identify the image and coordinates of a polygon resulting from translations in the coordinate plane • define the Pythagorean Theorem • identify the hypotenuse and legs of a right triangle 	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 2: Measurement and Geometry</i></p> <ul style="list-style-type: none"> • recognize and determine vertical, adjacent, supplementary, and complementary angles • determine the volume of cones using labeled diagrams and formulas • identify the image and coordinates of translations and/or reflections of polygons in the coordinate plane • apply the Pythagorean Theorem when the hypotenuse is unknown • subdivide a plane figure into polygons and calculate the area and perimeter of resulting polygons 	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 2: Measurement and Geometry</i></p> <ul style="list-style-type: none"> • describe and use angle relationships to determine the measure of unknown angles • determine the surface area and volume of square-based pyramids with and without diagrams • examine the relationship between the volume of cones and cylinders and the volume of rectangular prisms and square-based pyramids • solve contextual problems involving volume of cones and square-based pyramids • apply translations and reflections or a combination of both to polygons in the coordinate plane and describe the result 	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 2: Measurement and Geometry</i></p> <ul style="list-style-type: none"> • solve contextual problems involving angle relationships • solve contextual problems involving surface area and volume of square-based pyramids • describe how a translation, reflection, or combination of both affects congruency, orientation, location, and symmetry of an image • describe in context practical applications of translations and reflections • verify the Pythagorean Theorem using diagrams and measurement • apply the Pythagorean Theorem, and its converse, to solve

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		<ul style="list-style-type: none">• apply the Pythagorean Theorem when the measure of one leg is unknown• determine whether a triangle is a right triangle given measures of its three sides• determine the area and perimeter of composite figures	<p>contextual problems involving right triangles</p> <ul style="list-style-type: none">• apply perimeter, circumference, and area formulas to solve contextual problems involving composite figures

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<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 3: Probability, Statistics, Patterns, Functions, and Algebra</i></p> <ul style="list-style-type: none"> • identify and describe the median and the range for data displayed in a boxplot • identify a scatterplot that represents a positive linear relationship, negative linear relationship, or no relationship • identify a missing data element given a data set and a scatterplot • represent algebraic expressions using models • define domain and range • describe the slope of a graphed linear function as positive, negative, or zero • make connections between tables and ordered pairs • identify the y-intercept of a graphed linear function 	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 3: Probability, Statistics, Patterns, Functions, and Algebra</i></p> <ul style="list-style-type: none"> • determine whether two events are independent or dependent • determine the probability of two independent events • identify and describe summary statistics represented in a boxplot • identify the boxplot that represents a given data set • organize and represent data in scatterplots • simplify algebraic expressions by combining like terms only • given the domain or range of a function, identify the table of values that represents that same function and vice versa • determine independent and dependent variables 	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 3: Probability, Statistics, Patterns, Functions, and Algebra</i></p> <ul style="list-style-type: none"> • determine the probability of two dependent events • formulate questions that require the collection or acquisition of data with a focus on boxplots and scatterplots • organize and represent data in a boxplot • analyze data represented in a boxplot • identify components of graphical displays that can be misleading • given a scatterplot, sketch the line of best fit • simplify algebraic expressions by applying order of operations with the distributive property and combining like terms 	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 3: Probability, Statistics, Patterns, Functions, and Algebra</i></p> <ul style="list-style-type: none"> • compare and contrast probability of independent and dependent events and explain how replacement impacts probability • compare and analyze two data sets represented in boxplots • describe the impact of an extreme data point on a boxplot • analyze and justify the relationships of data represented in scatterplots • apply the properties of real numbers and the order of operations to generate equivalent algebraic expressions • determine whether a relation represented as a

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<ul style="list-style-type: none"> represent two-step linear equations using models or pictorial representations 	<p>from ordered pairs or a table of values</p> <ul style="list-style-type: none"> make connections between graphs and tables describe the slope or y-intercept of an equation in $y = mx + b$ form graph linear equations when given a table of values create a table of values for a linear function given an equation in $y = mx + b$ form or a graph solve two-step linear equations solve and graph one-step linear inequalities 	<ul style="list-style-type: none"> determine whether a relation is a function given a function represented as a set of ordered pairs, table of values, or graph of discrete points, identify the domain and range and vice versa determine independent and dependent variables from contextual linear situations describe slope and y-intercept given a table or graph graph linear equations given in $y = mx + b$ form determine how adding a constant to the equation of a proportional relationship will translate the line on the coordinate plane apply properties of real numbers and properties of equality to solve and graph multistep linear equations write multistep linear inequalities to represent a 	<p>set of ordered pairs, table, or graph of discrete points is a function</p> <ul style="list-style-type: none"> given a proportional relationship represented as an equation, table, or contextual situation, write the equation and graph the resulting line after a constant is added write a linear equation given a graph, table, or contextual situation solve contextual problems involving multistep linear equations apply properties of real numbers and properties of inequality to solve and graph multistep linear inequalities, including those in context create a verbal situation in context given a multistep linear equation or a multistep linear inequality

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		<p>verbal situation, including those in context</p> <ul style="list-style-type: none">• apply properties of real numbers and properties of inequality to solve and graph two-step linear inequalities, including those in context• identify a numerical value that is part of the solution set of an inequality	