AVENTA LEARNING

Alignment Document

State of Virginia
And
Aventa Learning Pre-Algebra

Pre-Algebra
2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
0	Number and Number Sense		
8.1	The student will simplify numerical expressions involving positive exponents, using rational numbers, order of operations, and properties of operations with real numbers; recognize, represent, compare, and order rational numbers expressed in scientific no		
8.1.1	Simplify numerical expressions containing exponents where the base is a rational number and the exponent is a positive whole number, using the order of operations and properties of operations with real numbers.	Basics	Exponents
8.1.2	Recognize, represent, compare, and order rational numbers expressed in scientific notation, using both positive and negative exponents.		
8.1.3	Compare and order fractions, decimals, percents, and numbers written in scientific notation.	Fractions	Fraction Basics
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
8.2	The student will describe orally and in writing the relationship between the subsets of the real number system.		

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8.2.1	Describe orally and in writing the relationships among the sets of Natural or Counting Numbers, Whole Numbers, Integers, Rational Numbers, Irrational Numbers, and Real Numbers.	Basics	Integer Math
8.2.2	Illustrate the relationships among the subsets of the real number system by using graphic organizers such as Venn diagrams. Subsets include real numbers, rational numbers, irrational numbers, integers, whole numbers, and natural numbers.		
8.2.3	Identify the subsets of the real number system to which a given number belongs.		
8.2.4	Determine whether a given number is a member of a particular subset of the real number system, and explain why.		
8.2.5	Describe each subset of the set of real numbers.		
0	Computation and Estimation		
8.3	The student will solve practical problems involving rational numbers, percents, ratios, and proportions. Problems will be of varying complexities and will involve real-life data, such as finding a discount and discount prices and balancing a checkbook.		
8.3.1	Solve practical problems by using computation procedures for whole numbers, integers, rational numbers, percents, ratios, and proportions.	Basics	Integer Math
		Basics	Absolute Value
		Basics	Exponents
		Fractions	Multiplying & Dividing
		Fractions	Adding and Subtracting
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
8.3.2	Maintain a checkbook and check registry for five or fewer transactions.		
8.3.3	Compute a discount and the resulting (sale) price for one discount.	Word Problems	Strategies
8.4	The student will apply the order of operations to evaluate algebraic expressions for given replacement values of the variables. Problems will be limited to positive exponents.		

8.4.1	Substitute numbers for variables in an algebraic expression and simplify the expression by using the order of operations. Exponents used are whole numbers less than 4.	Polynomials	Evaluating Polynomials
8.4.2	Apply the order of operations to evaluate formulas.	Factoring and Geometric Formulas	Geometric Formulas
8.5	The student, given a whole number from 0 to 100, will identify it as a perfect square or find the two consecutive whole numbers between which the square root lies.		
8.5.1	Identify the perfect squares from 0 to 100.		
8.5.2	Identify the two consecutive whole numbers between which the square root of a given whole number from 0 to 100 lies (e.g., the square root of 57 lies between 7 and 8 since 7 squared = 49 and 8 squared = 64).		
0	Measurement		
8.6	The student will verify by measuring and describe the relationships among vertical angles, supplementary angles, and complementary angles and will measure and draw angles of less than 360°.		
8.6.1	Measure angles of less than 360° to the nearest degree, using appropriate tools.		
8.6.2	Identify and describe the relationships among the angles formed by two intersecting lines.		
8.6.3	Identify and describe pairs of angles that are vertical.		
8.6.4	Identify and describe pairs of angles that are supplementary.		
8.6.5	Identify and describe pairs of angles that are complementary.		
8.7	The student will investigate and solve practical problems involving volume and surface area of rectangular solids (prisms), cylinders, cones, and pyramids.		
8.7.1	Compute the surface area of a pyramid by finding the sum of the areas of the triangular faces and the base.		
8.7.2	Compute the surface area of a cone by calculating the sum of the areas of the side and the base, using formulas.		

8.7.3	Compute the volume and surface area of rectangular solids (prisms), cylinders, cones, and square pyramids, using formulas.		
8.7.4	Investigate and solve problems involving volume and surface area of rectangular solids (prisms), cylinders, cones and pyramids.		
0	Geometry		
8.8	The student will apply transformations (rotate or turn, reflect or flip, translate or slide, and dilate or scale) to geometric figures represented on graph paper. The student will identify applications of transformations, such as tiling, fabric design, and art.		
8.8.1	Identify the geometric transformations (rotation, reflection, translation, and dilation) by using a variety of real-life examples		
8.8.2	Demonstrate the reflection of a figure over a vertical or horizontal line on a coordinate grid.		
8.8.3	Demonstrate 90° 180°, 270°, and 360° rotations of a figure on a coordinate grid.		
8.8.4	Demonstrate the translation of a figure on a coordinate grid.		
8.8.5	Demonstrate the dilation of a figure from a fixed point on a coordinate grid.		
8.9	The student will construct a three-dimensional model, given the top, side, and/or bottom views.		
8.9.1	Construct three-dimensional models, given top, side, and bottom views.		
8.10	The student will verify the Pythagorean Theorem, using diagrams, concrete materials, and measurement; and apply the Pythagorean Theorem to find the missing length of a side of a right triangle when given the lengths of the other two sides.		
8.10.1	Identify the parts of a right triangle (the hypotenuse and the legs).	Factoring and Geometric Formulas	Geometric Formulas
8.10.2	Verify the Pythagorean Theorem, using diagrams, concrete materials, and measurement.	Factoring and Geometric Formulas	Geometric Formulas

8.10.3	Find the measure of a side of a right triangle, given the measures of the other two sides. The measures of the sides of the triangle may be whole numbers no larger than 15 or decimals in tenths.	Factoring and Geometric Formulas	Geometric Formulas
8.10.4	Solve real-life problems involving right triangles by using the Pythagorean Theorem.	Factoring and Geometric Formulas	Geometric Formulas
0	Probability and Statistics		
8.11	The student will analyze problem situations, including games of chance, board games, or grading scales, and make predictions, using knowledge of probability.		
8.11.1	Analyze a problem situation, and determine the likelihood of an event occurring, using knowledge of probability.	Probability and Data Analysis	Data Analysis Projects
8.11.2	Predict the outcome of an event by analyzing its probability.		
8.11.3	Explain the consequences of making different choices, using knowledge of probability.	Probability and Data Analysis	Data Analysis Projects
		Probability and Data Analysis	Probability
8.11.4	Make predictions about the outcomes of games of chance, board games, and grading scales by using knowledge of probability.	Probability and Data Analysis	Probability
8.12	The student will make comparisons, predictions, and inferences, using information displayed in frequency distributions; box-and whisker plots; scattergrams; line, bar, circle, and picture graphs; and histograms.		
8.12.1	Make comparisons, predictions, and inferences, given data sets of no more than 20 items that are displayed in frequency distributions; box-and-whisker plots; scattergrams; line, bar, circle, and picture graphs; and histograms.	Probability and Data Analysis	Probability
8.13	The student will use a matrix to organize and describe data.		
8.13.1	Describe the characteristics of a matrix, including designating labels for rows and columns.		
8.13.2	Use a matrix of no more than 12 entries to organize and describe a data set.		

8.13.3	Identify the position of an element by row and column.		
8.13.4	Transfer data from a chart to a matrix.		
0	Patterns, Functions, and Algebra		
8.14	The student will describe and represent relations and functions, using tables, graphs, and rules; and relate and compare tables, graphs, and rules as different forms of representation for relationships.		
8.14.1	Graph in a coordinate plane ordered pairs that represent a relation.	Equations	Linear Equations
8.14.2	Write a rule that represents a relation from a table of values.		
8.14.3	Write a table of values from the rule that represents a relation.		
8.14.4	Write a table of values from the graph of ordered pairs of a relation.	Equations	Linear Equations
8.14.5	Describe and represent relations and functions, using tables, graphs, and rules.		
8.14.6	Relate and compare different representations of the same relation.		
8.15	The student will solve two-step equations and inequalities in one variable, using concrete materials, pictorial representations, and paper and pencil.		
8.15.1	Solve two-step linear equations by showing the steps and using algebraic sentences.	Equations	Solving Simple Equations
		Equations	Linear Equations
8.15.2	Solve two-step inequalities by showing the steps and using algebraic sentences.		
8.16	The student will graph a linear equation in two variables, in the coordinate plane, using a table of ordered pairs.		
8.16.1	Construct a table of ordered pairs by substituting values for x in a linear equation to find values for y.	Equations	Linear Equations
8.16.2	Plot in the coordinate plane ordered pairs (x, y) from a table.	Equations	Linear Equations
8.16.3	Connect the ordered pairs to form a straight line.	Equations	Linear Equations
8.17	The student will create and solve problems, using proportions, formulas, and functions.		
8.17.1	Write problems that require establishing a relationship between ratios.		
8.17.2	Solve problems by using proportions.		

8.17.3	Create problems that require the use of a formula.		
8.17.4	Substitute known values for variables in a formula.	Factoring and Geometric Formulas	Geometric Formulas
8.17.5	Solve a formula by using algebraic procedures.		
8.17.6	Create problems that involve a functional relationship.		
8.17.7	Solve problems that involve functions.		
8.18	The student will use the following algebraic terms appropriately: domain, range, independent variable, and dependent variable.		
8.18.1	Apply the following algebraic terms appropriately: domain, range, independent variable, and dependent variable.		
8.18.2	Identify examples of domain, range, independent variable, and dependent variable.		
8.18.3	Determine the domain of a function.		
8.18.4	Determine the range of a function.		
8.18.5	Determine the independent variable of a relationship.		
8.18.6	Determine the dependent variable of a relationship.		