



# Alignment Document

## State of Pennsylvania And Aventa Learning Pre-Algebra

### Pre-Algebra 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
2.1.8	Numbers, Number Systems and Number Relationships		
2.1.8.A	Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).	Basics	Exponents
		Fractions	Fraction Basics
		Fractions	Negative Exponents
		Decimals and Percents	Introduction
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
2.1.8.B	Simplify numerical expressions involving exponents, scientific notation and using order of operations.	Basics	Exponents
		Fractions	Negative Exponents
2.1.8.C	Distinguish between and order rational and irrational numbers.		
2.1.8.D	Apply ratio and proportion to mathematical problem situations involving distance, rate, time and similar triangles.		
2.1.8.E	Simplify and expand algebraic expressions using exponential forms.	Polynomials	Multiplying
2.1.8.F	Use the number line model to demonstrate integers and their applications.	Basics	Integer Math

2.1.8.G	Use the inverse relationships between addition, subtraction, multiplication, division, exponentiation and root extraction to determine unknown quantities in equations.	Equations	Solving Simple Equations
2.2.8	Computation and Estimation		
2.2.8.A	Complete calculations by applying the order of operations.	Basics	Integer Math
2.2.8.B	Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.	Basics	Integer Math
		Fractions	Fraction Basics
		Fractions	Negative Exponents
		Decimals and Percents	Introduction
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
2.2.8.C	Estimate the value of irrational numbers.		
2.2.8.D	Estimate amount of tips and discounts using ratios, proportions and percents.	Decimals and Percents	Percents
2.2.8.E	Determine the appropriateness of overestimating or underestimating in computation.		
2.2.8.F	Identify the difference between exact value and approximation and determine which is appropriate for a given situation.		
2.3.8	Measurement and Estimation		
2.3.8.A	Develop formulas and procedures for determining measurements (e.g., area, volume, distance).	Factoring and Geometric Formulas	Geometric Formulas
2.3.8.B	Solve rate problems (e.g., rate X time = distance, principal X interest rate = interest).		
2.3.8.C	Measure angles in degrees and determine relations of angles.		
2.3.8.D	Estimate, use and describe measures of distance, rate, perimeter, area, volume, weight, mass and angles.	Factoring and Geometric Formulas	Geometric Formulas
2.3.8.E	Describe how a change in linear dimension of an object affects its perimeter, area and volume.		

2.3.8.F	Use scale measurements to interpret maps or drawings.		
2.3.8.G	Create and use scale models.		
2.4.8	Mathematical Reasoning and Connections		
2.4.8.A	Make conjectures based on logical reasoning and test conjectures by using counter-examples.	Probability and Data Analysis	Data Analysis Projects
2.4.8.B	Combine numeric relationships to arrive at a conclusion.		
2.4.8.C	Use if...then statements to construct simple, valid arguments.		
2.4.8.D	Construct, use and explain algorithmic procedures for computing and estimating with whole numbers, fractions, decimals and integers.	Fractions	Addition and Subtraction
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Number Basics	Significant Digits
2.4.8.E	Distinguish between inductive and deductive reasoning.		
2.4.8.F	Use measurements and statistics to quantify issues (e.g., in family, consumer science situations).		
2.5.8	Mathematical Problem Solving and Communication		
2.5.8.A	Invent, select, use and justify the appropriate methods, materials and strategies to solve problems.	Fractions	Addition and Subtraction
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Number Basics	Significant Digits
2.5.8.B	Verify and interpret results using precise mathematical language, notation and representations, including numerical tables and equations, simple algebraic equations and formulas, charts, graphs and diagrams.	Fractions	Addition and Subtraction
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Number Basics	Significant Digits
		Equations	Introduction
		Equations	Solving Simple Linear Equations

2.5.8.C	Justify strategies and defend approaches used and conclusions reached.	Fractions	Addition and Subtraction
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Number Basics	Significant Digits
		Equations	Introduction
		Equations	Solving Simple Linear Equations
2.5.8.D	Determine pertinent information in problem situations and whether any further information is needed for solution.	Fractions	Addition and Subtraction
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Number Basics	Significant Digits
		Equations	Introduction
		Equations	Solving Simple Linear Equations
<b>2.6.8</b>	<b>Statistics and Data Analysis</b>		
2.6.8.A	Compare and contrast different plots of data using values of mean, median, mode, quartiles and range.	Probability and Data Analysis	Probability
2.6.8.B	Explain effects of sampling procedures and missing or incorrect information on reliability.		
2.6.8.C	Fit a line to the scatter plot of two quantities and describe any correlation of the variables.		
2.6.8.D	Design and carry out a random sampling procedure.	Probability and Data Analysis	Data Analysis Projects
2.6.8.E	Analyze and display data in stem-and-leaf and box-and-whisker plots.	Probability and Data Analysis	Probability
2.6.8.F	Use scientific and graphing calculators and computer spreadsheets to organize and analyze data.		
2.6.8.G	Determine the validity of the sampling method described in studies published in local or national newspapers.		
<b>2.7.8</b>	<b>Probability and Predictions</b>		
2.7.8.A	Determine the number of combinations and permutations for an event.		

2.7.8.B	Present the results of an experiment using visual representations (e.g., tables, charts, graphs).	Probability and Data Analysis	Data Analysis Projects
2.7.8.C	Analyze predictions (e.g., election polls).		
2.7.8.D	Compare and contrast results from observations and mathematical models.		
2.7.8.E	Make valid inferences, predictions and arguments based on probability.	Probability and Data Analysis	Data Analysis Projects
<b>2.8.8</b>	<b>Algebra and Functions</b>		
2.8.8.A	Apply simple algebraic patterns to basic number theory and to spatial relations.		
2.8.8.B	Discover, describe and generalize patterns, including linear, exponential and simple quadratic relationships.	Equations	Linear Equations
2.8.8.C	Create and interpret expressions, equations or inequalities that model problem situations.		
2.8.8.D	Use concrete objects to model algebraic concepts.		
2.8.8.E	Select and use a strategy to solve an equation or inequality, explain the solution and check the solution for accuracy.	Equations	Solving Simple Equations
		Equations	Linear Equations
2.8.8.F	Solve and graph equations and inequalities using scientific and graphing calculators and computer spreadsheets.		
2.8.8.G	Represent relationships with tables or graphs in the coordinate plane and verbal or symbolic rules.		
2.8.8.H	Graph a linear function from a rule or table.	Equations	Linear Equations
2.8.8.I	Generate a table or graph from a function and use graphing calculators and computer spreadsheets to graph and analyze functions.		



2.8.8.J	Show that an equality relationship between two quantities remains the same as long as the same change is made to both quantities; explain how a change in one quantity determines another quantity in a functional relationship.		
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