



Alignment Document  
State of Hawaii and Aventa Learning Pre-Algebra

**Pre-Algebra**  
2005-2007 Benchmark Blueprint

Strand	Standard	Topic	Benchmark	Unit Name	Course Topic Description
Numbers and Operations	<b>PA.1</b> Understand numbers, ways of representing numbers, relationships among numbers, and number systems	Numbers and Number Systems	<b>MA.PA.1.1</b> Identify situations represented by square roots and cube roots  <b>MA.PA.1.2</b> Compare and order rational numbers and square roots  <b>MA.PA.1.3</b> Use ratios and proportions to represent the relationship between two quantities	Geometric Concepts	Proportions
Numbers and Operations	<b>PA.2</b> Understand the meaning of operations and how they relate to each other	Operations	<b>MA.PA.2.1</b> Apply the order of operations when calculating with rational numbers  <b>MA.PA.2.2</b> Demonstrate the inverse relationship between square numbers and square roots, and cubes and cubed roots	Basics	Integer Math
Numbers and Operations	<b>PA.3</b> Use computational tools and strategies fluently and, when appropriate, use estimation	Computational Fluency  Estimation	<b>MA.PA.3.1</b> Add, subtract, multiply, and divide numbers with whole number exponents  <b>MA.PA.3.2</b> Estimate a reasonable range (i.e., upper and lower limit) for the solution to a problem	Basics  Fractions	Exponents  Negative Exponents

			<b>MA.PA.3.3</b> Explain that rounding answers in certain real-world situations may lead to major problems	Number Basics Basic Geometry	Significant Figures Geometric Formulas
Measurement	<b>PA.4</b> Understand attributes, units, and systems of units in measurement; and develop and use techniques, tools, and formulas for measuring	Measurement Attributes and Units  Measurement Tools and Techniques  Measurement Formulas	<b>MA.PA.4.1</b> Select and use appropriate units to measure the surface area and volume of solids  <b>MA.PA.4.2</b> Express rates of change as a ratio of two different measures, where units are included in the ratio, and use the derived rate to solve problems  <b>MA.PA.4.3</b> Use ratios and proportions to solve measurement problems  <b>MA.PA.4.4</b> Use formulas to determine the surface area and volume of selected prisms, cylinders, and pyramids  <b>MA.PA.4.5</b> Use the right triangle relationships (e.g., trigonometric ratios: cosine, sine, and tangent) to solve problems	Basic Geometry Basic Geometry Geometric Concepts and Proportions Geometric Concepts and Proportions Basic Geometry	Geometric Formulas Three Dimensional Measurements Proportions Proportions Three-Dimensional Measurements
Geometry and Spatial Sense	<b>PA.5</b> Analyze properties of objects and relationships among the properties	Geometric Shapes and Their Properties and Relationships	<b>MA.PA.5.1</b> Apply the Pythagorean theorem to solve problems involving right triangles  <b>MA.PA.5.2</b> Evaluate conjectures about classes of two- and three-dimensional shapes/objects	Basic Geometry Basic Geometry	Geometric Formulas Three-Dimensional Measurements
Geometry and Spatial Sense	<b>PA.6</b> Use transformations and symmetry to analyze mathematical situations	Transformation	<b>MA.PA.6.1</b> Perform a transformation (reflection, rotation, translation) when given a figure and necessary parameters  <b>MA.PA.6.2</b> Describe the size, position, and orientation of shapes under transformations and compositions of transformations	Geometric Concepts and Proportions Geometric Concepts and Proportions	Geometric Concepts Geometric Concepts

			<b>MA.PA.6.3</b> Describe three-dimensional shapes that are formed by rotating two-dimensional figures about an axis	Geometric Concepts and Proportions	Geometric Concepts
Geometry and Spatial Sense	<b>PA.7</b> Use visualization and spatial reasoning to solve problems both within and outside of mathematics	Visualization and Spatial Reasoning	<b>MA.PA.7.1</b> Use two-dimensional representations of pyramids, prisms, and cylinders to solve problems involving these figures	Basic Geometry	Three-Dimensional Measurements
Geometry and Spatial Sense	<b>PA.8</b> Select and use different representational systems, including coordinate geometry	Coordinate Geometry	<b>MA.PA.8.1</b> Use coordinate geometry to represent transformations in the coordinate plane	Geometric Concepts and Proportions	Geometric Concepts
Patterns, Functions, and Algebra	<b>PA.9</b> Understand various types of patterns and functional relationships	Patterns	<b>MA.PA.9.1</b> Represent a variety of patterns (including recursive patterns) with tables, graphs (including graphing technology when available), words, and when possible, symbolic rules	Word Problems	Strategies
		Functions	<b>MA.PA.9.2</b> Use linear relationships with two variables to solve problems	Equations	Linear Equations
			<b>MA.PA.9.3</b> Identify functions as linear or nonlinear and contrast their properties from tables, graphs (including graphing technology when available), or equations	Equations	Linear Equations
Patterns, Functions, and Algebra	<b>PA.10</b> Use symbolic forms to represent, model, and analyze mathematical situations	Numeric and Algebraic Representations	<b>MA.PA.10.1</b> Translate among tables, graphs (including graphing technology when available), and equations involving linear relationships	Equations	Linear Equations
			<b>MA.PA.10.2</b> Solve linear equations and inequalities with two variables using algebraic methods, manipulatives, or models	Equations	Linear Equations
			<b>MA.PA.10.3</b> Use tables and graphs to represent and compare linear relationships	Equations	Linear Equations

		Rates of Change	<b>MA.PA.10.4</b> Use the slope of a line to describe a constant rate of change	Equations	Linear Equations
Data Analysis, Statistics, and Probability	<b>PA.11</b> Pose questions and collect, organize, and represent data to answer those questions	Data Collection and Representation	<p><b>MA.PA.11.1</b> Design a study that compares two samples, collect data, and select the appropriate representation (double bar graph, back-to-back stem and leaf plot, parallel box and whisker plots, scatter plot) to compare the sets of data</p> <p><b>MA.PA.11.2</b> Judge the validity of data based on the data collection method</p>	<p>Probability and Data Analysis</p> <p>Probability and Data Analysis</p>	<p>Probability</p> <p>Data Analysis Projects</p>
Data Analysis, Statistics, and Probability	<b>PA.12</b> Interpret data using methods of exploratory data analysis	Data Interpretation	<p><b>MA.PA.12.1</b> Recognize situations appropriate for scatter plots</p> <p><b>MA.PA.12.2</b> Analyze different representations of the same data to describe how representations can be used to skew a person's interpretation of the data</p>	<p>Probability and Data Analysis</p> <p>Probability and Data Analysis</p>	<p>Probability</p> <p>Probability</p>
Data Analysis, Statistics, and Probability	<b>PA.13</b> Develop and evaluate inferences, predictions, and arguments that are based on data	Predictions and Inferences	<b>MA.PA.13.1</b> Make conjectures about possible relationships between two characteristics of a sample based on interpretations of scatter plots	Probability and Data Analysis	Probability
Data Analysis, Statistics, and Probability	<b>PA.14</b> Understand and apply basic notions of chance and probability	Probability	<p><b>MA.PA.14.1</b> Judge the validity of conjectures that are based on experiments or simulations</p> <p><b>MA.PA.14.2</b> Calculate probabilities for simple events under different relationships (e.g., inclusion, disjoint, complementary, independent, dependent, with replacement, without replacement)</p> <p><b>MA.PA.14.3</b> Use the Fundamental Counting Principle to calculate combinations and permutations</p>	Probability and Data Analysis	Probability