AVENTA LEARNING

Alignment Document
State of Nebraska and Aventa Learning Geometry

Geometry
2005-2007 Benchmark Blueprint

Strand	Standards	Benchmarks	Unit Name	Course Topic Description
12.1 Numeration/Number Sense	**12.1.1** Describe and compare the relationships between subsets of real numbers.	**12.1.1.A** Draw Venn diagrams including, but not limited to, natural, whole, integers, rational, irrational, and real numbers.		
		12.1.1.B Find intersection and union of two sets of numbers.		
		12.1.1.C Given a number, identify which subsets it belongs.		
		12.1.1.D Justify why a number does not belong to a specific set.		
	12.1.2 Express the equivalent forms of numbers using exponents, radicals, scientific notation, absolute values, fractions, decimals, and percents.			
12.2 Computation/Estimation	**12.2.1** Solve theoretical and applied problems using numbers in equivalent forms, radicals, exponents, scientific notation, absolute values, fractions, decimals, and percents, ratios and proportions, order of operations, and properties of real numbers.		Similarity Right Triangles and Trig Perimeters and Areas Perimeters and Areas	Ratios and Proportions Review of Pythagorean Theorem Perimeters and Areas of Triangles and Polygons Perimeters and Areas of Quadrilaterals

			Perimeters and Areas	Circumferences and Areas of Circles
			Connections From Algebra	Basic Algebraic Principles
			Connections From Algebra	Properties of Equality
			Connections From Algebra	Addition and Subtraction Properties of Equality
			Connections From Algebra	A Geometric Application
			Connections From Algebra	Properties of addition
			Connections From Algebra	Properties of Multiplication
			Connections From Algebra	Symmetry
			Connections From Algebra	Transitive
			Connections From Algebra	Substitution
			Connections From Algebra	Distributive
	12.2.2 Justify solutions to mathematical problems.	**12.2.2.A** Write an explanation based on the context of the problem stating why the solution is reasonable.	Reasoning and Intro to Proof	Inductive Reasoning
			Reasoning and Intro to Proof	Recognizing Number Patterns By Inductive Method

			Reasoning and Intro to Proof	Counter Examples
			Reasoning and Intro to Proof	Geometric Induction
			Reasoning and Intro to Proof	Language of Reasoning
			Reasoning and Intro to Proof	Truth Tables
			Reasoning and Intro to Proof	Compound Statements
			Reasoning and Intro to Proof	Postulates and Converses
			Reasoning and Intro to Proof	Laws of Deductive Reasoning
			Reasoning and Intro to Proof	Law of Detachment
			Reasoning and Intro to Proof	Law of Syllogism
			Reasoning and Intro to Proof	Inverse of a Conditional Statement
			Reasoning and Intro to Proof	Properties From Algebra and Proof
	12.2.3 Perform estimations and computations of real numbers mentally, with paper and pencil, and with technology.		Perimeters and Areas	The Area of a Triangle
			Perimeters and	Area of Polygons, Perimeter of

			Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas Right Triangles and Trigonometry Right Triangles and Trigonometry Right Triangles and Trigonometry	Regular Polygons Area and Perimeter of a Square, Rectangle and Parallelogram Area and Perimeter of Rhombuses and Trapezoids Circumferences and Areas of Circles Sector of a Circle and Its Area Review of Pythagorean Theorem Right Triangles, Special Triangles, Pythagorean Theorem Indirect Measurement
12.3 Measurement	**12.3.1** Select and use measuring units, tools, and/or technology and explain the degree of accuracy and precision of measurements.	**12.3.1.A** Explain the accuracy of the measurement.		
		12.3.1.B Explain the precision of the measurement tool.		
	12.3.2 Convert between metric and standard units of measurement, given conversion factors.	**12.3.2.A** Change yards to meters.		
		12.3.2.B Change miles/hours to meters/second.		
12.4 Geometry/Spatial Concepts	**12.4.1** Calculate perimeter and area of two-dimensional shapes and surface area and volume of three-dimensional shapes.		Perimeters and Areas Perimeters and Areas	Perimeters and Areas of Triangles and Polygons The Area of a Triangle

			Perimeters and Areas	Area of Polygons, Perimeter of Regular Polygons
			Perimeters and Areas	Area and Perimeter of a Square, Rectangle and Parallelogram
			Perimeters and Areas	Area and Perimeter of Rhombuses and Trapezoids
			Perimeters and Areas	Circumferences and Areas of Circles
			Perimeters and Areas	Sector of a Circle and Its Area
	12.4.2 Create geometric models to describe the physical world.	**12.4.2.A** Create perspective drawing.		
		12.4.2.B Create scale models.		
	12.4.3 Evaluate characteristics and properties of two-and three-dimensional geometric shapes.	**12.4.3.A** Classify and compare attributes of two- and three-dimensional shapes.	Quadrilaterals and Polygons	What are Quadrilaterals?
			Quadrilaterals and Polygons	Main Classes of Quadrilaterals
			Quadrilaterals and Polygons	A Square and Its Properties
			Quadrilaterals and Polygons	Rectangles and Their Properties What are Parallelograms?
			Quadrilaterals and Polygons	Rhombus and Its Properties
			Quadrilaterals and Polygons	The Trapezoid
			Quadrilaterals and	What are Polygons?

			Polygons	
			Quadrilaterals and Polygons	Types of Polygons
			Quadrilaterals and Polygons	Convex, Concave
		12.4.3.B Classify shapes in terms of congruence and similarity and apply these relationships.	Similarity	Ratios and Proportions
			Similarity	Similar Triangles
			Similarity	Similar Quadrilaterals
			Similarity	Similar Polygons
			Congruent Triangles and Congruence Tests	Congruence of Geometric Figures
			Congruent Triangles and Congruence Tests	When Two Triangles Are Congruent SAS Postulate
			Congruent Triangles and Congruence Tests	ASA Postulate
			Congruent Triangles and Congruence Tests	SSS Postulate
			Congruent Triangles and Congruence Tests	AAS Postulate
			Congruent Triangles and Congruence	HL Postulate

			Tests	
		12.4.3.C Determine the effects of changing dimensions on perimeter, area, and volume.	Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas	Perimeters and Areas of Triangles and Polygons The Area of a Triangle Area of Polygons, Perimeter of Regular Polygons Area and Perimeter of a Square, Rectangle and Parallelogram Area and Perimeter of Rhombuses and Trapezoids Circumferences and Areas of Circles Sector of a Circle and Its Area
		12.4.3.D Investigate and deduce geometric properties using transformations such as translations, rotations, and reflections.		
	12.4.4 Apply coordinate geometry to locate and describe objects algebraically.	**12.4.4.A** Graph a geometric shape and determine the slope of the sides.		
		12.4.4.B Identify the missing vertices of a polygon.		
	12.4.5 Apply right triangle trigonometry to find length and angle measures.		Triangles and Trigonometry Triangles and Trigonometry	Special Ratios in a Right Triangle Sine, Cosine, Tangent, Cotangent

			Triangles and Trigonometry	Relationships Between Trigonometric Ratios
	12.4.6 Apply geometric properties to solve problems.	**12.4.6.A** Find missing angles and lengths of geometric shapes using geometric properties. (Properties may include, but are not limited to, similarity, parallel and line-transversal).	Rays and Angles	Rays, Angles and forming triangles
			Rays and Angles	How Angles Are Measured
			Rays and Angles	Vertical Angles
			Rays and Angles	Adjacent Angles
			Rays and Angles	Supplementary Angles
			Rays and Angles	Complementary Angles
			Right Angles and Perpendicular Lines	Right Angles and Perpendicular Lines
			Parallel Lines and the Coordinate Plane	Angles Formed by Parallel Lines and their Transversals
			Parallel Lines and the Coordinate Plane	Alternate Interior Angles
			Parallel Lines and the Coordinate Plane	Alternate Exterior Angles
			Parallel Lines and the Coordinate Plane	Corresponding Angles
	12.4.7 Apply deductive reasoning to arrive at a conclusion.	**12.4.7.A** Justify steps when solving an algebraic equation using properties of real numbers.	Connections From Algebra	Basic Algebraic Principles
			Connections From	Properties of Equality

			Algebra	
			Connections From Algebra	Addition and Subtraction Properties of Equality
			Connections From Algebra	A Geometric Application
			Connections From Algebra	Properties
			Connections From Algebra	Properties of addition
			Connections From Algebra	Properties of Multiplication
			Connections From Algebra	Symmetry
			Connections From Algebra	Transitive
			Connections From Algebra	Substitution
			Connections From Algebra	Distributive
		12.4.7.B Use logic statements, paragraph proof, two-column proof, or algebraic proof to arrive at a conclusion.	Reasoning and Intro to Proof	Inductive Reasoning
			Reasoning and Intro to Proof	Recognizing Number Patterns By Inductive Method
			Reasoning and Intro to Proof	Counter Examples

			Reasoning and Intro to Proof	Geometric Induction
			Reasoning and Intro to Proof	Language of Reasoning
			Reasoning and Intro to Proof	Truth Tables
			Reasoning and Intro to Proof	Compound Statements
			Reasoning and Intro to Proof	Postulates and Converses
			Reasoning and Intro to Proof	Laws of Deductive Reasoning
			Reasoning and Intro to Proof	Law of Detachment
			Reasoning and Intro to Proof	Law of Syllogism
			Reasoning and Intro to Proof	Inverse of a Conditional Statement
			Reasoning and Intro to Proof	Properties From Algebra and Proof
			Special Triangles	Equilateral Triangles: Proof
			Special Triangles	Triangle Inequalities: Indirect Proof
			Quadrilaterals and	Parallelograms: Proof

			Polygons	
12.5 Data Analysis, Probability, and Statistical Concepts	**12.5.1** Select a sampling technique to gather data, analyze the resulting data, and make inferences.	**12.5.1.A** Justify the chosen sampling techniques.		
		12.5.1.B Use technology to analyze the data.		
	12.5.2 Write equations and make predictions from sets of data.	**12.5.2.A** Display data in a scatter plot, describe its shape, and estimate how close the data comes to fitting an equation.		
		12.5.2.B Relate the slope of a regression line to the rate of change for the data set.		
		12.5.2.C Determine what the y-intercept or beginning value indicates about the data.		
		12.5.2.D Determine the validity of predictions made from regression equations.		
	12.5.3 Apply theoretical probability to represent problems and make decisions.	**12.5.3.A** Explain the likelihood of the next event based on theoretical probabilities.		
	12.5.4 Evaluate how transformations on data affect the measures of central tendency and variability.	**12.5.4.A** Describe how adding the same amount to each score changes the mean, median, mode, range, outliers, interquartile points, maximum, and minimum.		
		12.5.4.B Describe how dropping an outlier changes the other measures.		
	12.5.5 Interpret data represented by the normal distribution and formulate conclusions.	**12.5.5.A** Sketch a normal or bell curve, label one and two standard deviations from the mean and fill in approximate percents associated with the deviations.		
		12.5.5.B Determine factors that will produce a curve that is not normal.		
		12.5.5.C Describe how sample size is related to a normal curve.		

		12.5.5.D Determine position or rank relative to others in a normally distributed group given the standard deviation and mean.		
	12.5.6 Calculate probabilities of independent events.	**12.5.6.A** Calculate probabilities using the fundamental counting principle and permutations.		
12.6 Algebraic Concepts	**12.6.1** Graph and interpret algebraic relations and inequalities.	**12.6.1.A** Describe a graph by identifying intercepts, slopes, maximum, minimum, increasing, decreasing, parallel, and perpendicular.	Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane	How to Write the Equation of a Line How to Display a Line on the Coordinate Plane Slope-Intercept Form Relationships Between Two Lines on a Plane
		12.6.1.B Use families of curves to describe the effect of changing coefficients of an equation.		
	12.6.2 Solve problems involving equations and inequalities.	**12.6.2.A** Use appropriate methods to solve linear and quadratic equations.	Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane	How to Write the Equation of a Line How to Display a Line on the Coordinate Plane Slope-Intercept Form

			Parallel Lines and the Coordinate Plane	Relationships Between Two Lines on a Plane
	12.6.3 Solve problems involving systems of two equations, and systems of two or more inequalities.	**12.6.3.A** Solve systems by graphing, substitution, elimination, or matrices.		
	12.6.4 Solve problems using patterns and functions.	**12.6.4.A** Apply direct and indirect variations.		
		12.6.4.B Recognize the properties of families of functions.		
		12.6.4.C Recognize patterns of exponential growth and decay and their significance to real-life situations.		
		12.6.4.D Represent a problem in multiple formats (words, tables, graphs, and symbols).	Reasoning and Intro to Proof	Recognizing Number Patterns By Inductive Method