



Alignment Document

State of West Virginia And Aventa Learning Geometry

Geometry 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
M.S.G.3	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships, specify locations and describe spatial relationships using coordinate geometry and other representational systems, apply transformations and use symmetry to analyze mathematical situations, and solve problems using visualization, spatial reasoning, and geometric modeling.		
M.O.G.3.1	represent geometric figures, such as points, lines, planes, segments, rays, and angles pictorially with proper identification and distinguish between undefined and defined terms.	Connections From Algebra	Pairs of Angles
		Connections From Algebra	Points
		Connections From Algebra	Ray

		Connections From Algebra	Rays and Angles
		Connections from Algebra	Classifying Angles
		Connections from Algebra	Right Angles and Perpendicular Lines
M.O.G.3.2	differentiate and apply inductive and deductive reasoning, justify conclusions in real-world settings.	Reasoning and Introduction to Proof	Inductive Reasoning
		Reasoning and Introduction to Proof	Reasoning and Introduction to Proof
		Reasoning and Introduction to Proof	Deductive Reasoning
M.O.G.3.3	use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and test the validity of conclusions with methods that include Venn Diagrams.	Reasoning and Introduction to Proof	If-Then Statements, Converses, and Postulates
M.O.G.3.4	validate conclusions by constructing logical arguments using both formal and informal methods with direct and indirect reasoning.	Reasoning and Introduction to Proof	Reasoning and Introduction to Proof
		Reasoning and Introduction to Proof	Deductive Reasoning
		Reasoning and Introduction to Proof	Two Column Proof
M.O.G.3.5	construct formal and informal proofs by applying definitions, theorems, and postulates related to such topics as complementary, supplementary, vertical angles, angles formed by perpendicular lines, and justify the steps.	Connections From Algebra	Pairs of Angles
		Connections From Algebra	Right Angles and Perpendicular Lines

M.O.G.3.6	compare and contrast the relationships between angles formed by two lines cut by a transversal when lines are parallel and when they are not parallel, and use the results to develop concepts that will justify parallelism.	Parallel Lines and Coordinate Plane	Lines and Points in Coordinate Plane
		Parallel Lines and Coordinate Plane	Lines and Points in a Plane
		Parallel Lines and Coordinate Plane	Equations of Lines in Coordinate Plane
M.O.G.3.7	make conjectures and justify congruence relationships with an emphasis on triangles and employ these relationships to solve problems.	Triangles Basic Closed Figures in Geometry	Congruent Triangles and Congruence Tests
M.O.G.3.8	identify general properties of and compare and contrast the properties of convex and concave quadrilaterals		
M.O.G.3.8.a	parallelograms	Quadrilaterals and Polygons	Parallelograms
M.O.G.3.8.b	rectangles	Quadrilaterals and Polygons	Squares and Rectangles
M.O.G.3.8.c	rhombuses	Quadrilaterals and Polygons	The Rhombus and Trapezoid
M.O.G.3.8.d	squares	Quadrilaterals and Polygons	Squares and Rectangles
M.O.G.3.8.e	trapezoids	Quadrilaterals and Polygons	The Rhombus and Trapezoid
M.O.G.3.9	draw conclusions in problem solving situations that include two and three dimensions of figures based on the properties of similarity.	Similarity	Similar Triangles
		Similarity	Similar Quadrilaterals and Polygons
M.O.G.3.10	investigate measures of angles and lengths of segments to determine the existence of a triangle (triangle inequality) and to establish the relationship between the measures of the angles and the length of the sides (with and without technology).	Special Triangles and Special Relationships in Triangles	Isosceles Triangles

		Special Triangles and Special Relationships in Triangles	Equilateral Triangles
		Special Triangles and Special Relationships in Triangles	Triangle Inequalities
		Triangles: Basic Closed Figures in Geometry	Basic Closed Figures in Geometry
M.O.G.3.11	verify and justify the basis for the trigonometric ratios by applying properties of similar triangles and use the results to find inaccessible heights and distances. Using the ratios of similar triangles to find unknown side lengths and angle measures, construct a physical model that illustrates the use of a scale drawing in a real-world situation.		
M.O.G.3.12	apply the Pythagorean Theorem and its converse to solve real-world problems and derive the special right triangle relationships (i.e. 30-60-90, 45-45-90).	Special Triangles and Special Relationships in Triangles	Right Triangles and Pythagorean Theorem
M.O.G.3.13	investigate measures of angles formed by chords, tangents, and secants of a circle and draw conclusions for the relationship to its arcs.	Circles	Arcs and Special segments
		Circles	Special Angles in Circles
M.O.G.3.14	find angle measures of interior and exterior angles; given a polygon, find the length of sides from given data; and use properties of regular polygons to find any unknown measurements of sides or angles.	Quadrilaterals and Polygons	Polygons
M.O.G.3.15	develop properties of tessellating figures and use those properties to tessellate the plane.		

M.O.G.3.16	derive and justify formulas for area, perimeter, surface area, and volume using nets and apply them to solve real-world problems.	Perimeters and Areas	Perimeters and Areas of Quadrilaterals
		Perimeters and Areas	Triangles and Polygons
		Perimeters and Areas	Area and Circumference of Circles
M.O.G.3.17	apply concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.	Parallel Lines and Coordinate Plane	Lines and Points in Coordinate Plane (distance, midpoint)
		Parallel Lines and Coordinate Plane	Equations of Lines in Coordinate Plane (slope)
M.O.G.3.18	construct a triangle's medians, altitudes, angle and perpendicular bisectors using various methods; and develop logical concepts about their relationships to be used in solving real-world problems.	Triangles: Basic Closed Figures in Geometry	Special Segments in Triangles
		Special Triangles and Special Relationships in Triangles	Isosceles Triangles
		Special Triangles and Special Relationships in Triangles	Equilateral Triangles
M.O.G.3.19	create and apply concepts using transformational geometry and laws of symmetry, of a reflection, translation, rotation, glide reflection, dilation of a figure, and develop logical arguments for congruency and similarity.		
M.O.G.3.20	compare and contrast Euclidean geometry to other geometries (i.e. spherical, elliptic) using various forms of communication such as development of physical models, oral or written reports.		



M.O.G.3.21	approximate the area of irregularly shaped regions based on the approximations and the attributes of the related region, develop a formula for finding the area of irregularly shaped regions. Plan, organize and present results by justifying conclusions.		
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