



Alignment Document
State of Arkansas and Aventa Learning Geometry

Geometry

Standards	Benchmarks	Unit Name	Course Topic Description
1 Students will develop the language of geometry including specialized vocabulary, reasoning, and application of theorems, properties, and postulates.	LG.1.G.1 Define, compare and contrast inductive reasoning and deductive reasoning for making predictions based on real world situations	Reasoning and Intro to Proof	Inductive Reasoning
		Reasoning and Intro to Proof	Conjecture
		Reasoning and Intro to Proof	Recognizing Number Patterns By Inductive Method
		Reasoning and Intro to Proof	Counterexamples
		Reasoning and Intro to Proof	Geometric Induction
		Reasoning and Intro to Proof	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
			LG.1.G.1.a venn diagrams
	LG.1.G.1.b matrix logic		
	LG.1.G.1.c conditional statements (statement, inverse, converse, and contrapositive)	Reasoning and Intro to Proof	Counterexamples
		Reasoning and Intro to Proof	Negation of a Statement
		Reasoning and Intro to Proof	Compound Statements

		Reasoning and Intro to Proof	Inverse of a Conditional Statement
	LG.1.G.1.d figural patterns	Reasoning and Intro to Proof	Recognizing Number Patterns By Inductive Method
	LG.1.G.2 Represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays, and angles	The Foundation of Geometry: Points and Lines	Basic Elements of Geometry: Points, Lines, and Planes
		The Foundation of Geometry: Points and Lines	Points
		The Foundation of Geometry: Points and Lines	Planes
		The Foundation of Geometry: Points and Lines	Line Segment
		The Foundation of Geometry: Points and Lines	Rays and Angles
	LG.1.G.3 Describe relationships derived from geometric figures or figural patterns	Reasoning and Intro to Proof	Recognizing Number Patterns By Inductive Method
		Reasoning and Intro to Proof	Using Algebraic Properties in Geometric Proofs
	LG.1.G.4 Apply, with and without appropriate technology, definitions, theorems, properties, and postulates related to such topics as complementary, supplementary, vertical angles, linear pairs, and angles formed by perpendicular lines	Reasoning and Intro to Proof	Postulates and Converses
		Reasoning and Intro to Proof	Geometric Postulates
		The Foundation of Geometry: Points and Lines	How to Classify Angles
		The Foundation of Geometry: Points and Lines	Types of Angles
		The Foundation of Geometry: Points and Lines	Vertical Angles
		The Foundation of Geometry: Points and Lines	Adjacent Angles



		The Foundation of Geometry: Points and Lines	Supplementary Angles
		The Foundation of Geometry: Points and Lines	Complementary Angles
		The Foundation of Geometry: Points and Lines	Right Angles and Perpendicular Lines
		The Foundation of Geometry: Points and Lines	Perpendicular-Bisector of a Segment
		Parallel Lines and the Coordinate Plane	Perpendicular Lines
	LG.1.G.5 Explore, with and without appropriate technology, the relationship between angles formed by two lines cut by a transversal to justify when lines are parallel	Parallel Lines and the Coordinate Plane	Parallel Lines and the Coordinate Plane
		Parallel Lines and the Coordinate Plane	Positions of Two Lines in a Plane
		Parallel Lines and the Coordinate Plane	Concurrent Lines
		Parallel Lines and the Coordinate Plane	Parallel Lines and Transversals
		Parallel Lines and the Coordinate Plane	Postulates about Parallel 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

		Plane	
		Parallel Lines and the Coordinate Plane	Corresponding Angles
		Parallel Lines and the Coordinate Plane	Important Theorems About Parallel and Transversal Lines
		Parallel Lines and the Coordinate Plane	Relationships Between Two Lines on a Plane
		Parallel Lines and the Coordinate Plane	Intersecting Lines
		Parallel Lines and the Coordinate Plane	Parallel Lines
		Parallel Lines and the Coordinate Plane	Perpendicular Lines
	LG.1.G.6 Give justification for conclusions reached by deductive reasoning. State and prove key basic theorems in geometry (i.e., the Pythagorean theorem, the sum of the measures of the angles of a triangle is 180° , and the line joining the midpoints of two sides of a triangle is parallel to the third side and half its length)	Reasoning and Intro to Proof	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
		Triangles	The Structure of a Triangle
		Triangles	Theorem 1
		Triangles	Classification of Triangles
		Triangles	Angle Based Classification of Triangles
		Triangles	Special Segments in Triangles

		Triangles	Altitude	
		Triangles	Median	
		Special Triangles	Isosceles Triangle and its Parts	
		Special Triangles	Theorem 1	
		Special Triangles	Properties of Medians of Isosceles Triangle	
		Special Triangles	Right Triangles: Basic Theorem	
		Special Triangles	30-60-90 Triangle	
		Special Triangles	45-45-90 Triangle (Isosceles Right Triangle)	
		Special Triangles	Pythagorean Theorem	
		Special Triangles	How to Apply Pythagorean Theorem	
<p>2 Students will identify and describe types of triangles and their special segments. They will use logic to apply the properties of congruence, similarity, and inequalities. The students will apply the Pythagorean Theorem and trigonometric ratios to solve problems in real world situations.</p>	<p>T.2.G.1 Apply congruence (SSS ...) and similarity (AA...) correspondences and properties of figures to find missing parts of geometric figures and provide logical justification</p>	Triangles	Congruence of Geometric Figures	
		Triangles	Congruent Postulate 1 (SAS Postulate)	
		Triangles	Postulate 2 (ASA Postulate)	
		Triangles	Postulate 3 (SSS Postulate)	
		Triangles	Postulate 4 (AAS Postulate)	
			Triangles	Postulate 5 (HL Postulate)
	<p>T.2.G.2 Investigate the measures of segments to determine the existence of triangles (triangle inequality theorem)</p>	Special Triangles	Side-Angle Inequality in a Triangle	
		Special Triangles	Exterior Angle Inequality	
		Special Triangles	Indirect Proof	
		Special Triangles	A Practical Example	

		Special Triangles	Shortest Distance Between a Point and a Line
		Special Triangles	Triangle Inequality
		Special Triangles	Difference of Sides Inequality
	T.2.G.3 Identify and use the special segments of triangles (altitude, median, angle bisector, perpendicular bisector, and midsegment) to solve problems	Triangles	Special Segments in Triangles
		Triangles	Altitude
		Triangles	Median
		Triangles	Angle Bisector
		Triangles	Property of Bisectors of Triangles
		Triangles	Perpendicular Bisectors
		Triangles	Properties of Perpendicular Bisectors of Triangles
		Special Triangles	Properties of Altitudes of Isosceles Triangle
		Special Triangles	Properties of Angle Bisectors of Isosceles Triangle
		Special Triangles	Properties of Perpendicular Bisectors of Isosceles Triangle
		Special Triangles	Equilateral or Equiangular Triangle
		Special Triangles	When Two Equilateral Triangles Are Congruent
	T.2.G.4 Apply the Pythagorean Theorem and its converse in solving practical problems	Special Triangles	Pythagorean Theorem
		Special Triangles	How to Apply Pythagorean Theorem
		Special Triangles	Side-Angle Inequality in a Triangle

	<p>Special Triangles</p> <p>Special Triangles</p> <p>Special Triangles</p> <p>Special Triangles</p> <p>Special Triangles</p> <p>Special Triangles</p> <p>Quadrilaterals and Polygons</p> <p>The Right Triangle and Trigonometry</p>	<p>Exterior Angle Inequality</p> <p>Indirect Proof</p> <p>A Practical Example</p> <p>Shortest Distance Between a Point and a Line</p> <p>Triangle Inequality</p> <p>Difference of Sides Inequality</p> <p>Application of Pythagorean Theorem in Squares</p> <p>Review of Pythagorean Theorem</p>
T.2.G.5 Use the special right triangle relationships (30° - 60° - 90° and 45° - 45° - 90°) to solve problems	<p>Special Triangles</p> <p>Special Triangles</p> <p>Special Triangles</p>	<p>Right Triangles: Basic Theorem</p> <p>30-60-90 Triangle</p> <p>45-45-90 Triangle (Isosceles Right Triangle)</p>
T.2.G.6 Use trigonometric ratios (sine, cosine, tangent) to determine lengths of sides and measures of angles in right triangles including angles of elevation and angles of depression	<p>The Right Triangle and Trigonometry</p> <p>The Right Triangle and Trigonometry</p> <p>The Right Triangle and Trigonometry</p> <p>The Right Triangle and Trigonometry</p> <p>The Right Triangle and Trigonometry</p>	<p>Indirect Measurement</p> <p>Sine Ratio</p> <p>Cosine Ratio</p> <p>Tangent Ratio</p> <p>Cotangent Ratio</p>



		The Right Triangle and Trigonometry	The Fundamental Identity of Trigonometry
		The Right Triangle and Trigonometry	Identity 1
		The Right Triangle and Trigonometry	Identity 2
		The Right Triangle and Trigonometry	Identity 3
		The Right Triangle and Trigonometry	Identity 4
		The Right Triangle and Trigonometry	Special Segments in Triangles
		The Right Triangle and Trigonometry	Law of Cosines
	<p>T.2.G.7 Use similarity of right triangles to express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given including angles of elevation and angles of depression</p>	The Right Triangle and Trigonometry	Cosine Ratio
		The Right Triangle and Trigonometry	Tangent Ratio
		The Right Triangle and Trigonometry	Cotangent Ratio
		The Right Triangle and Trigonometry	The Fundamental Identity of Trigonometry
		The Right Triangle and Trigonometry	Identity 1
		The Right Triangle and Trigonometry	Identity 2



		The Right Triangle and Trigonometry	Identity 3
		The Right Triangle and Trigonometry	Identity 4
		The Right Triangle and Trigonometry	Special Segments in Triangles
		The Right Triangle and Trigonometry	Law of Cosines
<p>3 Students will measure and compare, while using appropriate formulas, tools, and technology to solve problems dealing with length, perimeter, area and volume.</p>	M.3.G.1 Calculate probabilities arising in geometric contexts		
	<p>M.3.G.2 Apply, using appropriate units, appropriate formulas (area, perimeter, surface area, volume) to solve application problems involving polygons, prisms, pyramids, cones, cylinders, spheres as well as composite figures, expressing solutions in both exact and approximate forms</p>	Perimeters and Areas	Areas of Triangles
		Perimeters and Areas	Area of Polygon
		Perimeters and Areas	Perimeter of Regular Polygon
		Perimeters and Areas	Area and Perimeter of a Square
		Perimeters and Areas	Area and Perimeter of Rectangle
		Perimeters and Areas	Area and Perimeter of the Parallelogram
		Perimeters and Areas	Area and Perimeter of Rhombus
		Perimeters and Areas	Area and Perimeter of Trapezoid
		Perimeters and Areas	Circumference of a Circle
Perimeters and Areas	Area of a Circle		
	Perimeters and Areas	Sector of a Circle and Its Area	
M.3.G.3 Relate changes in the measurement of one attribute of an object to changes in	Perimeters and Areas	Areas of Triangles	

	<p>other attributes</p>	<p>Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas Perimeters and Areas</p>	<p>Area of Polygon Perimeter of Regular Polygon Area and Perimeter of a Square Area and Perimeter of Rectangle Area and Perimeter of the Parallelogram Area and Perimeter of Rhombus Area and Perimeter of Trapezoid Circumference of a Circle Area of a Circle Sector of a Circle and Its Area</p>
	<p>M.3.G.4 Use (given similar geometric objects) proportional reasoning to solve practical problems (including scale drawings)</p>	<p>Similarity Similarity Similarity Similarity Similarity Similarity Similarity</p>	<p>Ratios and Proportions Proportions and Their Properties Similar Figures Similar Triangles When are Two Triangles Similar? Prove that the Triangles are Similar Similar Quadrilaterals</p>
	<p>M.3.G.5 Identify and apply properties of and theorems about parallel and perpendicular lines to prove other theorems and perform basic Euclidean constructions</p>	<p>Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane</p>	<p>Positions of Two Lines in a Plane Concurrent Lines</p>

		Parallel Lines and the Coordinate Plane	Parallel Lines and Transversals
		Parallel Lines and the Coordinate Plane	Postulates about Parallel 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
		Parallel Lines and the Coordinate Plane	Important Theorems About Parallel and Transversal Lines
		Quadrilaterals and Polygons	Special Segments in a Polygon: Diagonals
		Quadrilaterals and Polygons	Apothems
		Quadrilaterals and Polygons	Sum of the Interior Angles of a Convex Polygon
		Quadrilaterals and Polygons	Measure of an Interior Angle in Regular Convex Polygon
<p>4 Students will analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.</p>	<p>R.4.G.1 Explore and verify the properties of quadrilaterals</p>	Quadrilaterals and Polygons	Quadrilaterals
		Quadrilaterals and Polygons	Main Classes of Quadrilaterals
		Quadrilaterals and Polygons	A Square and Its Properties
		Quadrilaterals and Polygons	Application of Pythagorean Theorem in Squares

	<p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p>	<p>Rectangles and Their Properties</p> <p>Properties of Diagonals in Squares and Rectangles</p> <p>Parallelograms</p> <p>Parallelograms Proof</p> <p>Rhombus and Its Properties</p> <p>The Trapezoid</p> <p>What are Polygons</p> <p>Convex Polygons</p> <p>Concave Polygons</p> <p>Special Segments in a Polygon: Diagonals</p> <p>Apothems</p> <p>Sum of the Interior Angles of a Convex Polygon</p> <p>Measure of an Interior Angle in Regular Convex Polygon</p>
	<p>R.4.G.2 Solve problems using properties of polygons:</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p> <p>Quadrilaterals and Polygons</p>	<p>Quadrilaterals</p> <p>Main Classes of Quadrilaterals</p> <p>A Square and Its Properties</p> <p>Application of Pythagorean Theorem in Squares</p> <p>Rectangles and Their Properties</p>

	Quadrilaterals and Polygons	Properties of Diagonals in Squares and Rectangles
	Quadrilaterals and Polygons	Parallelograms
	Quadrilaterals and Polygons	Parallelograms Proof
	Quadrilaterals and Polygons	Rhombus and Its Properties
	Quadrilaterals and Polygons	The Trapezoid
	Quadrilaterals and Polygons	What are Polygons
	Quadrilaterals and Polygons	Convex Polygons
	Quadrilaterals and Polygons	Concave Polygons
	Quadrilaterals and Polygons	Special Segments in a Polygon: Diagonals
	Quadrilaterals and Polygons	Apothems
R.4.G.2.a sum of the measures of the interior angles of a polygon	Quadrilaterals and Polygons	Sum of the Interior Angles of a Convex Polygon
	Quadrilaterals and Polygons	Measure of an Interior Angle in Regular Convex Polygon
R.4.G.2.b interior and exterior angle measure of a regular polygon or irregular polygon	Quadrilaterals and Polygons	Sum of the Interior Angles of a Convex Polygon
	Quadrilaterals and Polygons	Measure of an Interior Angle in Regular Convex Polygon
R.4.G.2.c number of sides or angles of a polygon	Quadrilaterals and Polygons	What are Polygons
R.4.G.3 Identify and explain why figures tessellate		
R.4.G.4 Identify the attributes of the five Platonic Solids		
R.4.G.5 Investigate and use the properties of	Circles	Theorems About Chords and Tangents

	angles (central and inscribed) arcs, chords, tangents, and secants to solve problems involving circles	Circles Circles Circles	Central Angles Inscribed Angles Tangent-Chord Angles
	R.4.G.6 Solve problems using inscribed and circumscribed figures	Circles	Inscribed Angles
	R.4.G.7 Use orthographic drawings (top, front, side) and isometric drawings (corner) to represent three-dimensional objects		
	R.4.G.8 Draw, examine, and classify cross-sections of three-dimensional objects		
	R.4.G.9 Explore non-Euclidean geometries, such as spherical geometry and identify its unique properties which result from a change in the parallel postulate		
5 Students will specify locations, apply transformations and describe relationships using coordinate geometry.	CGT.5.G.1 Use coordinate geometry to find the distance between two points, the midpoint of a segment, and the slopes of parallel, perpendicular, horizontal, and vertical lines	Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane	Length of a Segment on a Coordinate Plane Distance Formula Midpoint of a Segment How to Write the Equation of a Line Slope Form Point-Slope Form Slope-Intercept Form



	Plane	
	Parallel Lines and the Coordinate Plane	How to Display a Line on the Coordinate Plane
	Parallel Lines and the Coordinate Plane	Relationships Between Two Lines on a Plane
	Parallel Lines and the Coordinate Plane	Intersecting Lines
	Parallel Lines and the Coordinate Plane	Parallel Lines
CGT.5.G.2 Write the equation of a line parallel to a line through a given point not on the line	Parallel Lines and the Coordinate Plane	How to Write the Equation of a Line
	Parallel Lines and the Coordinate Plane	Slope Form
	Parallel Lines and the Coordinate Plane	Point-Slope Form
	Parallel Lines and the Coordinate Plane	Slope-Intercept Form
	Parallel Lines and the Coordinate Plane	How to Display a Line on the Coordinate Plane
	Parallel Lines and the Coordinate Plane	Relationships Between Two Lines on a Plane
	Parallel Lines and the Coordinate Plane	Intersecting Lines
	Parallel Lines and the Coordinate Plane	Parallel Lines
CGT.5.G.3 Write the equation of a line	Parallel Lines and the Coordinate Plane	Perpendicular Lines

	perpendicular to a line through a given point	Plane	
	CGT.5.G.4 Write the equation of the perpendicular bisector of a line segment	Parallel Lines and the Coordinate Plane	Perpendicular Lines
	CGT.5.G.5 Determine, given a set of points, the type of figure based on its properties (parallelogram, isosceles triangle, trapezoid)		
	CGT.5.G.6 Write, in standard form, the equation of a circle given a graph on a coordinate plane or the center and radius of a circle	Circle Circle	Standard Equation of a Circle Equation of a Circle with Radius R units and Center at (a, b)
	CGT.5.G.7 Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane		
	CGT.5.G.7.a translations		
	CGT.5.G.7.b reflections		
	CGT.5.G.7.c rotations (90°, 180°, clockwise and counterclockwise about the origin)		
	CGT.5.G.7.d dilations (scale factor)	Similarity Similarity Similarity Similarity Similarity Similarity Similarity	Ratios and Proportions Proportions and Their Properties Similar Figures Similar Triangles When are Two Triangles Similar? Prove that the Triangles are Similar Similar Quadrilaterals