MARYLAND STATE DEPARTMENT OF EDUCATION
Achievement Matters Most

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Maryland's State Curriculum - High School Mathematics

All high school students in the 21st century need to be mathematically competent and confident problem solvers if they are going to be able to be successful after graduation. The goal of the Maryland State Curriculum for High School Mathematics for College and Workplace Readiness is to provide high school students access to a curriculum that will achieve this goal by preparing graduating seniors for the first credit-bearing mathematics course in college and/or preparing them for employment in high-performance, high-growth jobs.

The Algebra/Data Analysis and Geometry State Curricula are divided into three columns:

- Identified prerequisites from the State Curriculum for Mathematics 3-8
- Algebra/Data Analysis or Geometry Core Learning Goals (CLG)
- Additional Topics

The first column, devoted to the 3-8 curriculum, includes the prerequisite knowledge for students prior to their studying the Algebra/Data Analysis or Geometry curriculum. The second column contains the Core Learning Goals (CLG). All students must successfully complete an Algebra/Data Analysis course and a Geometry course in which the CLG are a part of the curriculum. The Algebra/Data Analysis CLG are assessed on the High School Assessment, a requirement for a high school diploma. The Algebra/Data Analysis High School Assessment also provides the data used to produce a school's Adequate Yearly Progress required by the No Child Left Behind Act. The third column includes additional topics for this course. The format of three columns is designed to assist teachers in seeing the connections between the State Curriculum 3-8, CLG, and additional topics. Information concerning instruction and assessment of the curriculum in the Algebra/Data Analysis and Geometry Core Learning Goals can be found at http://www.mdk12.org/instruction/curriculum/mathematics

The Algebra II State Curriculum is divided into two columns:

- Algebra II Core Content
- Additional topics

The first column is comprised of an edited version of the Bridge Goals that was prepared during 1996-2000 by a group of Maryland's high school and college mathematics teachers. The edited version also includes content contained in the American Diploma Project Algebra II curriculum. The goal of the State Curriculum AII is for students to be prepared to enter successfully into a credit-bearing college mathematics course.

As an integral part of the learning and assessment of mathematics in Maryland, students are expected to be able to communicate mathematically by explaining how they arrive at a solution to a given problem, and to justify the correctness of their solution. Where appropriate, justifications may be given in the form of an algebraic or geometric proof. In addition, the processes of problem solving and reasoning should be integral to the mathematics curriculum. Formative and summative assessments should reflect the instruction while addressing the various levels of cognitive demand in mathematics. Real-world applications and connections to other disciplines are critical to all mathematics, and should be included throughout the mathematics curriculum. Note that specific applications are not included in these documents. This is a deliberate decision to avoid an unintentional narrowing of the instruction. Examples of applications may be found in public release items at http://www.mdk12.org/intruction/curriculum/mathematics/clg_toolkit.html

Technology – in the form of graphing calculators, computers and appropriate software-- is vital to the study of mathematics, and should be used to enhance students' understanding of various mathematics subject matter. Technology should be employed when it can enhance students' understanding without diminishing mental mathematics and estimation skills.

Maryland's State Curriculum for High School Mathematics will help teachers provide instruction in mathematics that enables students to view mathematics as an understandable, useful, and enjoyable subject.

State Curriculum – Geometry

Pre-requisites Summarized from State Curriculum Mathematics Grades 3 – 8 and Algebra/Data Analysis CLG	Geometry State Curriculum	
	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Standard 2.0 Knowledge of Geometry A1 Analyze properties of plane geometric figures Grades 3 & 5 • Identify polygons within a composite figure Grades 5 & 6 • Identify and describe relationships of lines and line segments Grades 3 – 6 • Identify, describe, and label points, lines, rays, vertices, angles, and planes using correct symbolic notation Grade 7 • Identify and describe the angles formed by intersecting lines, line segments, and rays including vertical, adjacent, complementary, and supplementary angles Grades 7 & 8 • Identify and describe the relationships between angles formed when parallel lines are cut by a transversal including alternate interior, alternate exterior, and corresponding angles Grades 7 & 8 • Identify and describe the relationship among the parts of a right triangle A2 Analyze geometric relationships Grade 4 • Compare and classify angles in geometric figures and pictures Grade 5 • Compare and classify quadrilaterals by length of sides and measures of angles Grade 6 • Compare and classify triangles by sides and angle measures • Identify and compare the relationship between parts of a circle Grades 6 & 7 • Determine a missing angle measure using the sum of the interior angles of a polygon Grade 7 • Determine the measure of angles formed by intersecting lines, line segments, and rays Grade 8 • Determine the measure of angles formed by parallel lines cut by a transversal B1 Analyze the properties of solid geometric figures Grades 3 – 5 • Identify and describe solid geometric figures using the number of edges, faces, vertices, or shape of base	**2.1 The student will represent and analyze two- and three-dimensional figures using tools and technology when appropriate.** **2.1.1 The student will analyze the properties of geometric figures.** **Assessment Limits** ➢ Essential properties, relationships, and geometric models include the following: • congruence and similarity • line/segment/plane relationships (parallel, perpendicular, intersecting, bisecting, midpoint, median, altitude) • point relationships (collinear, coplanar) • angles and angle relationships (vertical, adjacent, complementary, supplementary, obtuse, acute, right, interior, exterior) • angle relationships with parallel lines • polygons (regular, non-regular, composite, equilateral, equiangular) • geometric solids (cones, cylinders, prisms, pyramids, composite figures) • circle/sphere (tangent, radius, diameter, chord, secant, central/inscribed angle, inscribed, circumscribed). **Skill Statement** The student describes and analyzes geometric figures.	**Solid Geometric Figures** 2.1.1.1 The student will recognize geometric solids when given the two-dimensional representations (e.g., nets, multiple views). 2.1.1.2 The student will draw two-dimensional representations of three-dimensional solids. 2.1.1.3 The student will analyze the properties and relationships of geometric solids with bases other than rectangles, triangles, or circles. 2.1.1.4 The student will analyze the properties and relationships of oblique solids. 2.1.1.5 The student will analyze the properties and relationships of truncated three-dimensional solids. **Radians** 2.1.1.6 The student will explore the relationship between the measure of the central angle and the arc length in a circle. 2.1.1.7 The student will explore the relationship between radian measure and the corresponding degree measure from 0 to 2π. **Perspective Drawings** 2.1.1.8 The student will analyze the properties of perspective drawings including vanishing points, lines of sight, and hidden lines.

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	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
B2 Analyze the relationship between plane geometric figures and surfaces of solid geometric figures Grades 3 – 5 • Compare plane figure to surfaces of solid geometric figures C1 Represent plane geometric figures Objective Grades 3 – 8 • Sketch or draw plane geometric figures D1 Analyze and apply the properties of congruent and/or similar polygons Grades 3 – 7 • Analyze and apply the properties of congruent polygons Grades 5 – 8 • Analyze and apply the properties of similar polygons	**2.1 The student will represent and analyze two- and three-dimensional figures using tools and technology when appropriate.** **2.1.1 The student will analyze the properties of geometric figures.** **Assessment Limits** ➢ Essential properties, relationships, and geometric models include the following: • congruence and similarity • line/segment/plane relationships (parallel, perpendicular, intersecting, bisecting, midpoint, median, altitude) • point relationships (collinear, coplanar) • angles and angle relationships (vertical, adjacent, complementary, supplementary, obtuse, acute, right, interior, exterior) • angle relationships with parallel lines • polygons (regular, non-regular, composite, equilateral, equiangular) • geometric solids (cones, cylinders, prisms, pyramids, composite figures) • circle/sphere (tangent, radius, diameter, chord, secant, central/inscribed angle, inscribed, circumscribed). **Skill Statement** The student describes and analyzes geometric figures.	

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	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Standard 1.0 Knowledge of Algebra, Patterns, or Functions B2 Identify, write, solve, and apply equations and inequalities Grades 3 – 8 and Algebra/Data Analysis CLG 1.2.1 • Solve linear equations from one-step to variables on both sides C1 Locate points on a number line and in a coordinate graph Grades 4 – 8 • Graph ordered pairs in the coordinate plane C2 Analyze linear relationships Grades 7 & 8 and Algebra/Data Analysis CLG 1.2.1 • Graph linear equations in a coordinate plane • Determine the slope of a line **Standard 2.0 Knowledge of Geometry** A1 Analyze properties of plane geometric figures Grades 3 & 5 • Identify polygons within a composite figure Grades 5 & 6 • Identify and describe relationships of lines and line segments Grades 3 – 6 • Identify, describe, and label points, lines, rays, vertices, angles, and planes using correct symbolic notation Grade 7 • Identify and describe the angles formed by intersecting lines, line segments, and rays including vertical, adjacent, complementary, and supplementary angles Grades 7 & 8 • Identify and describe the relationships between angles formed when parallel lines are cut by a transversal including alternate interior, alternate exterior, and corresponding angles Grades 7 & 8 • Identify and describe the relationship among the parts of a right triangle A2 Analyze geometric relationships Grade 4 • Compare and classify angles in geometric figures and pictures	**2.1 The student will represent and analyze two- and three-dimensional figures using tools and technology when appropriate.** **2.1.2 The student will identify and/or verify properties of geometric figures using the coordinate plane and concepts from algebra.** **<u>Assessment Limits</u>** ➢ "Verify properties" means to justify solutions using definitions and/or mathematical principles. ➢ Properties, relationships, and geometric models include the following: • congruence and similarity • line/segment relationships (parallel, perpendicular, intersecting, bisecting, midpoint, median, altitude) • point relationships (collinear) • angles and angle relationships (obtuse, acute, right) • polygons (regular, non-regular, equilateral, equiangular) • circle (tangent, radius, diameter, chord). ➢ Items for this indicator may be set on the coordinate plane or may just have coordinates identified with no grid. ➢ Concepts from algebra include applications of the distance, midpoint, and slope formulas. **<u>Skills Statement</u>** The student uses the coordinate plane and algebra to analyze geometric figures.	**Polar Coordinates** 2.1.2.1 The student will locate points on the polar coordinate system including points with rotation greater than 360°. 2.1.2.2 The student will explore the relationship between a point on the coordinate plane with the same point on the polar coordinate system. **Three-dimensional Coordinate Plane** 2.1.2.3 The student will represent a point in space as an ordered triple. 2.1.2.4 The student will use the distance and midpoint formulas for segments in three-dimensional space. 2.1.2.5 The student will explore relationships given a set of points in space such as collinear, coplanar, and relative placement inside or outside a figure.

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Grade 5 • Compare and classify quadrilaterals by length of sides and measures of angles Grade 6 • Compare and classify triangles by sides and angle measures • Identify and compare the relationship between parts of a circle Grades 6 & 7 • Determine a missing angle measure using the sum of the interior angles of a polygons Grade 7 • Determine the measure of angles formed by intersecting lines, line segments, and rays Grade 8 • Determine the measure of angles formed by parallel lines cut by a transversal C1 Represent plane geometric figures Grades 3 – 8 • Sketch or draw plane geometric figures Grade 6 • Identify, describe, or draw a polygon on a coordinate plane D1 Analyze and apply the properties of congruent and/or similar polygons Grades 3 – 7 • Analyze and apply the properties of congruent polygons Grades 5 – 8 • Analyze and apply the properties of similar polygons **Standard 7.0 Processes of Mathematics** B1 Justify ideas or solutions with mathematical concepts or proofs	**2.1 The student will represent and analyze two- and three-dimensional figures using tools and technology when appropriate.** **2.1.2 The student will identify and/or verify properties of geometric figures using the coordinate plane and concepts from algebra.** **Assessment Limits** ➢ "Verify properties" means to justify solutions using definitions and/or mathematical principles. ➢ Properties, relationships, and geometric models include the following: • congruence and similarity • line/segment relationships (parallel, perpendicular, intersecting, bisecting, midpoint, median, altitude) • point relationships (collinear) • angles and angle relationships (obtuse, acute, right) • polygons (regular, non-regular, equilateral, equiangular) • circle (tangent, radius, diameter, chord). ➢ Items for this indicator may be set on the coordinate plane or may just have coordinates identified with no grid. ➢ Concepts from algebra include applications of the distance, midpoint, and slope formulas. **Skills Statement** The student uses the coordinate plane and algebra to analyze geometric figures.	

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	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Standard 1.0 Knowledge of Algebra, Patterns, or Functions C1 Locate points on a number line and in a coordinate graph Grades 4 – 8 • Graph ordered pairs in the coordinate plane **Standard 2.0 Knowledge of Geometry** A1 Analyze properties of plane geometric figures Grades 3 & 5 • Identify polygons within a composite figure Grades 5 & 6 • Identify and describe relationships of lines and line segments Grades 3 – 6 • Identify, describe, and label points, lines, rays, vertices, angles, and planes using correct symbolic notation Grade 7 • Identify and describe the angles formed by intersecting lines, line segments, and rays including vertical, adjacent, complementary, and supplementary angles A2 Analyze geometric relationships Grade 4 • Compare and classify angles in geometric figures and pictures Grade 5 • Compare and classify quadrilaterals by length of sides and measures of angles Grade 6 • Compare and classify triangles by sides and angle measures C1 Represent plane geometric figures Grades 3 – 8 • Sketch or draw plane geometric figures Grades 7 & 8 • Construct geometric figures using a variety of construction tools	**2.1 The student will represent and analyze two- and three-dimensional figures using tools and technology when appropriate.** **2.1.3 The student will use transformations to move figures, create designs, and/or demonstrate geometric properties.** **Assessment Limits** ➢ Transformations include reflections, rotations, translations, and dilations. ➢ Items should go beyond the identification of transformations. ➢ Essential properties and relationships include the following: congruence, similarity, and symmetry. ➢ The student's explanation of a transformation must include the following: • translation – distance and direction • reflection – line of reflection • rotation – center of rotation, angle measure, direction (clockwise or counterclockwise) • dilation – center and scale factor. ➢ Paper folding and the use of Miras™ and mirrors are appropriate methods for performing transformations, and their use must be referenced. **Skill Statement** Given one or more transformations, the student sketches the result of the transformation(s) and/or explains the geometric effect of the transformation(s) on the figure.	**Matrices** 2.1.3.1 The student will write and plot ordered pairs from matrix notation. 2.1.3.2 The student will find transformation images, including rotations, reflections, dilations and translations, using matrices. **Vectors** 2.1.3.3 The student will identify the distance and direction of a given vector. 2.1.3.4 The student will find resultant vectors. 2.1.3.5 The student will describe translations using vectors. 2.1.3.6 The student will find translation images using vector sums.

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	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
D1 Analyze and apply the properties of congruence and/or similar polygons Grades 3 – 7 • Analyze and apply the properties of congruent polygons Grades 5 – 8 • Analyze and apply the properties of similar polygons E1 Analyze a transformation Grades 3 – 5 • Identify and describe the results of translations, reflections, and rotations Grades 6 – 8 • Identify, describe, and plot transformations on a coordinate plane Grade 7 • Identify and describe transformations that result in rotational and reflectional symmetry **Standard 3.0 Knowledge of Measurement** B1 Measure in customary and metric units Grades 3 – 6 • Measure length in customary and metric unit B2 Measure angles in polygons Grades 5 & 6 • Measure angles in a polygon **Standard 7.0 Processes of Mathematics** B1 Justify ideas or solutions with mathematical concepts or proofs	**2.1 The student will represent and analyze two- and three-dimensional figures using tools and technology when appropriate.** **2.1.3 The student will use transformations to move figures, create designs, and/or demonstrate geometric properties.** **<u>Assessment Limits</u>** ➢ Transformations include reflections, rotations, translations, and dilations. ➢ Items should go beyond the identification of transformations. ➢ Essential properties and relationships include the following: congruence, similarity, and symmetry. ➢ The student's explanation of a transformation must include the following: • translation – distance and direction • reflection – line of reflection • rotation – center of rotation, angle measure, direction (clockwise or counterclockwise) • dilation – center and scale factor. ➢ Paper folding and the use of Miras™ and mirrors are appropriate methods for performing transformations, and their use must be referenced. **<u>Skill Statement</u>** Given one or more transformations, the student sketches the result of the transformation(s) and/or explains the geometric effect of the transformation(s) on the figure.	

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	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Standard 2.0 Knowledge of Geometry A1 Analyze properties of plane geometric figures Grades 3 & 5 • Identify polygons within a composite figure Grades 5 & 6 • Identify and describe relationships of lines and line segments Grades 3 – 6 • Identify, describe, and label points, lines, rays, vertices, angles, and planes using correct symbolic notation Grade 7 • Identify and describe the angles formed by intersecting lines, line segments, and rays including vertical, adjacent, complementary, and supplementary angles Grades 7 & 8 • Identify and describe the relationships between angles formed when parallel lines are cut by a transversal including alternate interior, alternate exterior, and corresponding angles Grades 7 & 8 • Identify and describe the relationship among the parts of a right triangle A2 Analyze geometric relationships Grade 4 • Compare and classify angles in geometric figures and pictures Grade 5 • Compare and classify quadrilaterals by length of sides and measures of angles Grade 6 • Compare and classify triangles by sides and angle measures • Identify and compare the relationship between parts of a circle Grades 6 & 7 • Determine a missing angle measure using the sum of the interior angles of a polygons Grade 7 • Determine the measure of angles formed by intersecting lines, line segments, and rays Grade 8 • Determine the measure of angles formed by parallel lines cut by a transversal	**2.1 The student will represent and analyze two- and three-dimensional figures using tools and technology when appropriate.** **2.1.4 The student will construct and/or draw and/or validate properties of geometric figures using appropriate tools and technology.** **Assessment Limits** ➢ "Validate properties" in this indicator, means justifying solutions using definitions, mathematical principles and/or measurement. ➢ Students may use a compass, straightedge, patty paper, a Mira™, and/or a mirror as construction tools. Using a ruler or protractor cannot be part of the strategy. ➢ Students may use a compass, ruler, patty paper, a Mira™, a mirror and/or a protractor as drawing tools. ➢ It is acceptable to do a construction when the item asks for a drawing. ➢ Paper folding and the use of Miras™ and mirrors are appropriate methods for representing, constructing, and/or analyzing figures, and their use must be referenced. ➢ Constructions and drawings are limited to the two-dimensional relationships listed in 2.1.1. **Skill Statement** The student draws and/or constructs geometric figures and/or justifies the solution.	**Perspective Drawings** 2.1.4.1 The student will use the properties of perspective drawings to draw two-dimensional or three-dimensional shapes using vanishing points, lines of sight, and hidden lines.

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	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
B1 Analyze the properties of solid geometric figures Grades 3 – 5 • Identify and describe solid geometric figures using the number of edges, faces, vertices, or shape of base B2 Analyze the relationship between plane geometric figures and surfaces of solid geometric figures Grades 3 – 5 • Compare plane figures to surfaces of solid geometric figures C1 Represent plane geometric figures Grades 3 – 8 • Sketch or draw plane geometric figures Grades 7 & 8 • Construct geometric figures using a variety of construction tools D1 Analyze and apply the properties of congruent and/or similar polygons Grades 3 – 7 • Analyze and apply the properties of congruent polygons Grades 5 – 8 • Analyze and apply the properties of similar polygons **Standard 3.0 Knowledge of Measurement** B1 Measure in customary and metric units Grades 3 – 6 • Measure length in customary and metric units B2 Measure angles in polygons Grades 5 & 6 • Measure angles in a polygon **Standard 7.0 Processes of Mathematics** B1 Justify ideas or solutions with mathematical concepts or proofs	**2.1 The student will represent and analyze two- and three-dimensional figures using tools and technology when appropriate.** **2.1.4 The student will construct and/or draw and/or validate properties of geometric figures using appropriate tools and technology.** **Assessment Limits** ➢ "Validate properties" in this indicator, means justifying solutions using definitions, mathematical principles and/or measurement. ➢ Students may use a compass, straightedge, patty paper, a Mira™, and/or a mirror as construction tools. Using a ruler or protractor cannot be part of the strategy. ➢ Students may use a compass, ruler, patty paper, a Mira™, a mirror and/or a protractor as drawing tools. ➢ It is acceptable to do a construction when the item asks for a drawing. ➢ Paper folding and the use of Miras™ and mirrors are appropriate methods for representing, constructing, and/or analyzing figures, and their use must be referenced. ➢ Constructions and drawings are limited to the two-dimensional relationships listed in 2.1.1. **Skill Statement** The student draws and/or constructs geometric figures and/or justifies the solution.	

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	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Standard 1.0 Knowledge of Algebra, Patterns and Functions. B2 Identify, write, solve, and apply equations and inequalities Grades 3 – 8 and Algebra/Data Analysis CLG 1.2.1 • Solve linear equations from one-step to variables on both sides **Standard 2.0 Knowledge of Geometry** A1 Analyze properties of plane geometric figures Grades 3 & 5 • Identify polygons within a composite figure Grades 5 & 6 • Identify and describe relationships of lines and line segments Grades 3 – 6 • Identify, describe, and label points, lines, rays, vertices, angles, and planes using correct symbolic notation Grades 7 • Identify and describe the angles formed by intersecting lines, line segments, and rays including vertical, adjacent, complementary, and supplementary angles Grades 7 & 8 • Identify and describe the relationships between angles formed when parallel lines are cut by a transversal including alternate interior, alternate exterior, and corresponding angles Grades 7 & 8 • Identify and describe the relationship among the parts of a right triangle A2 Analyze geometric relationships Grade 4 • Compare and classify angles in geometric figures and pictures Grade 5 • Compare and classify quadrilaterals by length of sides and measures of angles Grade 6 • Compare and classify triangles by sides and angle measures • Identify and compare the relationship between parts of a circle Grades 6 & 7 • Determine a missing angle measure using the sum of the interior angles of polygons Grade 7 • Determine the measure of angles formed by intersecting lines, line segments, and rays	**2.2 The student will apply geometric properties and relationships to solve problems using tools and technology when appropriate.** **2.2.1 The student will identify and/or verify congruent and similar figures and/or apply equality or proportionality of their corresponding parts.** **Assessment Limits** ➢ Students will demonstrate geometric reasoning and justify conclusions. Although the focus is on geometric theory, answers to some items may include a numeric answer. ➢ Corresponding measurements include length, angle measure, perimeter, circumference, area, volume, surface area and lateral area. **Skill Statement** ➢ The student recognizes shapes as congruent or similar, calculates corresponding measurements, and/or justifies conclusions. ➢ The student uses congruency and similarity statements to identify corresponding parts of figures.	

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	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Grade 8 • Determine the measure of angles formed by parallel lines cut by a transversal D1 Analyze and apply the properties of congruent and/or similar polygons Grades 3 – 7 • Analyze and apply the properties of congruent polygons Grades 5 – 8 • Analyze and apply the properties of similar polygons **Standard 3.0 Knowledge of measurement** C1 Estimate and apply measurement formulas Grades 3 – 7 • Estimate and determine area and perimeter of geometric figures Grade 6 • Determine the missing dimension of rectangles Grades 6 – 8 • Estimate and determine the surface area and volume of geometric solids including prisms, cylinders, cones, pyramids, and spheres Grade 8 • Estimate and determine the area and circumference of a circle C2 Analyze measurement relationships Grade 7 • Determine the missing dimension for a figure using a scale Grade 8 • Use proportional reasoning to solve measurement problems	**2.2 The student will apply geometric properties and relationships to solve problems using tools and technology when appropriate.** **2.2.1 The student will identify and/or verify congruent and similar figures and/or apply equality or proportionality of their corresponding parts.** **Assessment Limits** ➢ Students will demonstrate geometric reasoning and justify conclusions. Although the focus is on geometric theory, answers to some items may include a numeric answer. ➢ Corresponding measurements include length, angle measure, perimeter, circumference, area, volume, surface area and lateral area. **Skill Statement** ➢ The student recognizes shapes as congruent or similar, calculates corresponding measurements, and/or justifies conclusions. ➢ The student uses congruency and similarity statements to identify corresponding parts of figures.	

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Pre-requisites Summarized from State Curriculum Mathematics Grades 3 – 8 and Algebra/Data Analysis CLG	Geometry State Curriculum	
	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Standard 6.0 Knowledge of Number Relationships or Computation C3 Analyze ratios, proportions, or percents Grades 6 – 8 • Determine or use ratios, unit rates, and percents, in the context of the problem Grade 8 • Solve problems using proportional reasoning **Standard 7.0 Processes of Mathematics** **B1 Justify ideas or solutions with mathematical concepts or proofs**	**2.2 The student will apply geometric properties and relationships to solve problems using tools and technology when appropriate.** **2.2.1 The student will identify and/or verify congruent and similar figures and/or apply equality or proportionality of their corresponding parts.** **Assessment Limits** ➢ Students will demonstrate geometric reasoning and justify conclusions. Although the focus is on geometric theory, answers to some items may include a numeric answer. ➢ Corresponding measurements include length, angle measure, perimeter, circumference, area, volume, surface area and lateral area. **Skill Statement** ➢ The student recognizes shapes as congruent or similar, calculates corresponding measurements, and/or justifies conclusions. ➢ The student uses congruency and similarity statements to identify corresponding parts of figures.	

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Standard 1.0 Knowledge of Algebra, Patterns and Functions B2 Identify, write, solve, and apply equations and inequalities Grades 3 – 8 and Algebra/Data Analysis CLG 1.2.1 • Solve linear equations from one-step to variables on both sides **Standard 2.0 Knowledge of Geometry** A2 Analyze geometric relationships Grade 4 • Compare and classify angles in geometric figures and pictures Grade 5 • Compare and classify quadrilaterals by length of sides and measures of angles Grade 6 • Compare and classify triangles by sides and angle measures • Identify and compare the relationship between parts of a circle Grades 6 & 7 • Determine a missing angle measure using the sum of the interior angles of a polygon Grade 7 • Determine the measure of angles formed by intersecting lines, line segments, and rays Grade 8 • Determine the measure of angles formed by parallel lines cut by a transversal • Use the Pythagorean Theorem to solve problems **Standard 6.0 Knowledge of Number Relationships or Computation** C1 Analyze number relationships and compute Grades 7 & 8 • Calculate powers of integers and square roots of perfect square whole numbers	**2.2 The student will apply geometric properties and relationships to solve problems using tools and technology.** **2.2.2 The student will solve problems using two-dimensional figures and/or right-triangle trigonometry.** **<u>Assessment Limits</u>** ➢ Students will demonstrate geometric reasoning and justify conclusions. ➢ Trigonometric functions may be used to find sides or angles. ➢ Trigonometric functions will be limited to sine, cosine, and tangent and their inverses. **<u>Skill Statement</u>** The student solves a problem involving missing parts of two-dimensional figures, which may require the use of right-triangle trigonometry, the Pythagorean theorem, or special right triangle relationships.	**Trigonometry** 2.2.2.1 The student will apply the Law of Sines and the Law of Cosines to solve problems involving oblique triangles. 2.2.2.2 The student will solve problems using the secant, cosecant, and cotangent functions. **Similarity/Right Triangles** 2.2.2.3 The student will use geometric mean and relationships between parts of a right triangle and the altitude drawn to the hypotenuse to find missing parts of right triangles.

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Pre-requisites Summarized from State Curriculum Mathematics Grades 3 – 8 and Algebra/Data Analysis CLG	Geometry State Curriculum	
	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Standard 2.0 Knowledge of Geometry A1 Analyze properties of plane geometric figures Grades 5 & 6 • Identify and describe relationships of lines and line segments Grade 7 • Identify and describe the angles formed by intersecting lines, line segments, and rays including vertical, adjacent, complementary, and supplementary angles Grades 7 & 8 • Identify and describe the relationships between angles formed when parallel lines are cut by a transversal including alternate interior, alternate exterior, and corresponding angles Grades 7 & 8 • Identify and describe the relationship among the parts of a right triangle A2 Analyze geometric relationships Grade 4 • Compare and classify angles in geometric figures and pictures Grade 5 • Compare and classify quadrilaterals by length of sides and measures of angles Grade 6 • Compare and classify triangles by sides and angle measures • Identify and compare the relationship between parts of a circle Grades 6 & 7 • Determine a missing angle measure using the sum of the interior angles of a polygon Grade 7 • Determine the measure of angles formed by intersecting lines, line segments, and rays Grade 8 • Determine the measure of angles formed by parallel lines cut by a transversal • Use the Pythagorean Theorem to solve problems B1 Analyze the properties of solid geometric figures Grades 3 – 5 • Identify and describe solid geometric figures using the number of edges, faces, vertices, or shape of base	**2.2 The student will apply geometric properties and relationships to solve problems using tools and technology when appropriate.** **2.2.3 The student will use inductive or deductive reasoning.** **Assessment Limits** ➢ Students are expected to demonstrate their geometric reasoning and justify conclusions. Although the focus is on geometric theory, answers to some questions may include a numeric answer. ➢ Items may include geometric applications, patterns, and logic, including syllogisms. ➢ Students are expected to use a logically thought out narrative, flow chart, or two-column proof as a valid argument. **Skill Statement** Given a situation, the student arrives at or justifies a conclusion using inductive or deductive reasoning.	**Algebraic Proofs** 2.2.3.1 The student will write algebraic proofs. **Non-Euclidean Geometry** 2.2.3.2 The student will recognize that there are geometries, other than Euclidean geometry, in which there is an alternative parallel postulate.

State Curriculum – Geometry

Pre-requisites Summarized from State Curriculum Mathematics Grades 3 – 8 and Algebra/Data Analysis CLG	Geometry State Curriculum	
	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
D1 Analyze and apply the properties of congruent and/or similar polygons Grades 3 – 7 • Analyze and apply the properties of congruent polygons Grades 5 – 8 • Analyze and apply the properties of similar polygons **Standard 7.0 Processes of Mathematics** B1 Justify ideas or solutions with mathematical concepts or proofs	**2.2 The student will apply geometric properties and relationships to solve problems using tools and technology when appropriate.** **2.2.3 The student will use inductive or deductive reasoning.** **Assessment Limits** ➢ Students are expected to demonstrate their geometric reasoning and justify conclusions. Although the focus is on geometric theory, answers to some questions may include a numeric answer. ➢ Items may include geometric applications, patterns, and logic, including syllogisms. ➢ Narrative, flow chart, or two-column proof may be used as a valid argument. **Skill Statement** Given a situation, the student arrives at or justifies a conclusion using inductive or deductive reasoning.	

State Curriculum – Geometry

Pre-requisites Summarized from State Curriculum Mathematics Grades 3 – 8 and Algebra/Data Analysis CLG	Geometry State Curriculum	
	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Standard 1.0 Knowledge of Algebra, Patterns, or Function B2 Identify, write, solve, and apply equations and inequalities Grades 3 – 8 and Algebra/Data Analysis CLG 1.2.1 • Solve linear equations from one-step to variables on both sides Grades 6 – 8 and Algebra/Data Analysis CLG 1.2.2 • Solve linear inequalities Grades 6 – 8 and Algebra/Data Analysis CLG 1.2.5 • Apply given formulas in a problem-solving situation **Standard 2.0 Knowledge of Geometry** A2 Analyze geometric relationships Grades 6 & 7 • Determine a missing angle measure using the sum of interior angles of a polygon Grade 8 • Determine the measure of angles formed by parallel lines cut by a transversal • Use the Pythagorean Theorem to solve problems D1 Analyze and apply the properties of congruent and/or similar polygons Grades 3 – 7 • Analyze and apply the properties of congruent polygons Grades 5 – 8 • Analyze and apply the properties of similar polygons **Standard 3.0 Knowledge of Measurement** B1 Measure in customary and metric units Grades 3 – 6 • Measure length in customary and metric units	**2.3 The student will apply concepts of measurement using tools and technology when appropriate.** **2.3.1 The student will use algebraic and/or geometric properties to measure indirectly.** **Assessment Limits** ➢ "Measure indirectly" means to use mathematical concepts such as congruence, similarity, and ratio and proportion to calculate measurements. ➢ Similarity and congruence will be directly stated or implied (scale drawings, enlargements.) ➢ Items may require the student to make comparisons. ➢ This indicator may incorporate measuring. ➢ This indicator does not include right-triangle trigonometry. **Skill Statement** The student calculates measurements indirectly by using mathematical concepts.	

State Curriculum – Geometry

Pre-requisites Summarized from State Curriculum Mathematics Grades 3 – 8 and Algebra/Data Analysis CLG	Geometry State Curriculum	
	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
B2 Measure angles in polygons Grades 5 & 6 • Measure angles in polygons C1 Estimate and apply measurement formulas Grades 3 – 7 • Estimate and determine the area and perimeter of geometric figures Grades 6 – 8 • Estimate and determine the surface area and volume of geometric solids including prisms, cylinders, cones, pyramids, and spheres Grade 8 • Estimate and determine the area and circumference of a circle C2 Analyze measurement relationships Grade 7 • Determine a missing dimension for a figure using a scale Grade 8 • Use proportional reasoning to solve measurement problems **Standard 6.0 Knowledge of Number Relationships or Computation** C3 Analyze ratios, proportions, or percents Grades 6 – 8 • Determine or use ratios, unit rates, and percents, in the context of the problem	**2.3 The student will apply concepts of measurement using tools and technology when appropriate.** **2.3.1 The student will use algebraic and/or geometric properties to measure indirectly.** **Assessment Limits** ➢ "Measure indirectly" means to use mathematical concepts such as congruence, similarity, and ratio and proportion to calculate measurements. ➢ Similarity and congruence will be directly stated or implied (scale drawings, enlargements.) ➢ Items may require the student to make comparisons. ➢ This indicator may incorporate measuring. ➢ This indicator does not include right-triangle trigonometry. **Skill Statement** The student calculates measurements indirectly by using mathematical concepts.	

State Curriculum – Geometry

Pre-requisites Summarized from State Curriculum Mathematics Grades 3 – 8 and Algebra/Data Analysis CLG	Geometry State Curriculum	
	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Standard 1.0 Knowledge of Algebra, Patterns, or Functions B2 Identify, write, solve, and apply equations and inequalities Grades 3 – 8 and Algebra/Data Analysis CLG 1.2.1 • Solve linear equations from one-step to variables on both sides Grades 6 – 8 and Algebra/Data Analysis CLG 1.2.2 • Solve linear inequalities Grades 6 – 8 and CLG 1.2.5 • Apply given formulas in a problem-solving situation **Standard 2.0 Knowledge of Geometry** A1 Analyze properties of plane geometric figures Grades 3 & 5 • Identify polygons within a composite figure Grades 5 & 6 • Identify and describe relationships of lines and line segments Grades 3 – 6 • Identify, describe, and label points, lines, rays, vertices, angles, and planes using correct symbolic notation Grade 7 • Identify and describe the angles formed by intersecting lines, line segments, and rays including vertical, adjacent, complementary, and supplementary angles Grades 7 & 8 • Identify and describe the relationships between angles formed when parallel lines are cut by a transversal including alternate interior, alternate exterior, and corresponding angles Grades 7 & 8 • Identify and describe the relationship among the parts of a right triangle A2 Analyze geometric relationships Grade 4 • Compare and classify angles in geometric figures and pictures Grade 5 • Compare and classify quadrilaterals by length of sides and measures of angles	**2.3 The student will apply concepts of measurement using tools and technology when appropriate.** **2.3.2 The student will use techniques of measurement and will estimate, calculate, and/or compare perimeter, circumference, area, volume, and/or surface area of two- and three-dimensional figures and their parts.** **Assessment Limits** ➢ Two-dimensional shapes include polygons, circles, and composite figures. ➢ Three-dimensional shapes include cubes, prisms, pyramids, cylinders, cones, spheres, and composite figures. ➢ Formulas will be provided. ➢ No oblique solids will be used. ➢ Items may involve applications of geometric properties and relationships. ➢ Students may be required to make comparisons which do not require calculations. **Skill Statement** The student solves a problem involving perimeter, area, surface area, lateral area, circumference, and/or volume expressing solutions with appropriate units.	**Circles** 2.3.2.1 The student will determine the area of a sector. 2.3.2.2 The student will determine the length of an arc. **Solid Geometric Figures** 2.3.2.3 The student will determine properties of oblique solid geometric figures. 2.3.2.4 The student will determine properties of pyramids that have non-square bases.

State Curriculum – Geometry

Pre-requisites Summarized from State Curriculum Mathematics Grades 3 – 8 and Algebra/Data Analysis CLG	Geometry State Curriculum	
	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Grade 6 • Compare and classify triangles by sides and angle measures • Identify and compare the relationship between parts of a circle Grades 6 & 7 • Determine a missing angle measure using the sum of the interior angles of a polygon Grade 7 • Determine the measure of angles formed by intersecting lines, line segments, and rays Grade 8 • Determine the measure of angles formed by parallel lines cut by a transversal B1 Analyze the properties of solid geometric figures Grades 3 – 5 • Identify and describe solid geometric figures using the number of edges, faces, vertices, or shape of base B2 Analyze the relationship between plane geometric figures and surfaces of solid geometric figures Grades 3 – 5 • Compare a plane figure to surfaces of solid geometric figures C1 Represent plane geometric figures Grades 3 – 8 • Sketch or draw plane geometric figures using a variety of tools **Standard 3.0 Knowledge of Measurement** C1 Estimate and apply measurement formulas Grades 3 – 7 • Estimate and determine the area and perimeter of geometric figures Grades 6 – 8 • Estimate and determine the surface area and volume of geometric solids including prisms, cylinders, cones, pyramids, and spheres Grade 8 • Estimate and determine the area and circumference of a circle	**2.3 The student will apply concepts of measurement using tools and technology when appropriate.** **2.3.2 The student will use techniques of measurement and will estimate, calculate, and/or compare perimeter, circumference, area, volume, and/or surface area of two- and three-dimensional figures and their parts.** **Assessment Limits** ➢ Two-dimensional shapes include polygons, circles, and composite figures. ➢ Three-dimensional shapes include cubes, prisms, pyramids, cylinders, cones, spheres, and composite figures. ➢ Formulas will be provided. ➢ No oblique solids will be used. ➢ Items may involve applications of geometric properties and relationships. ➢ Students may be required to make comparisons which do not require calculations. **Skill Statement** The student solves a problem involving perimeter, area, surface area, lateral area, circumference, and/or volume expressing solutions with appropriate units.	

State Curriculum – Geometry

Pre-requisites Summarized from State Curriculum Mathematics Grades 3 – 8 and Algebra/Data Analysis CLG	Geometry State Curriculum	
	CLG 2 The student will demonstrate the ability to solve mathematical and real-world problems using measurement and geometric models and will justify solutions and explain processes used.	**Additional Topics Would Include**
Standard 6.0 Knowledge of Number Relationships or Computation C2 Apply estimation strategies Grades 3 – 8 Use estimation to determine the reasonableness of an answer	**2.3 The student will apply concepts of measurement using tools and technology when appropriate.** **2.3.2 The student will use techniques of measurement and will estimate, calculate, and/or compare perimeter, circumference, area, volume, and/or surface area of two- and three-dimensional figures and their parts.** **Assessment Limits** ➢ Two-dimensional shapes include polygons, circles, and composite figures. ➢ Three-dimensional shapes include cubes, prisms, pyramids, cylinders, cones, spheres, and composite figures. ➢ Formulas will be provided. ➢ No oblique solids will be used. ➢ Items may involve applications of geometric properties and relationships. ➢ Students may be required to make comparisons which do not require calculations. **Skill Statement** The student solves a problem involving perimeter, area, surface area, lateral area, circumference, and/or volume expressing solutions with appropriate units.	