WDHS Curriculum Map: created by Julia Holloway, Mike Seeley, and Jen Stuart
Course: Math 10 June 2013

Time Interval/ Content	*Standards/ Strands*	*Essential Questions*	*Skills*	*Assessment*
Unit 1: Congruence, Proof, and Constructions	• G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. • G.CO.2 Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g. translation versus horizontal stretch). • G.CO.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. • G.CO.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. • G.CO.5 Given a geometric figure and a rotation, reflection, or translation,	• Can all terms be defined? • Can all concepts be proven? Explain. • How are points, lines, and planes related? • What does it mean for two figures to be congruent? • How are the side measures and angle measures related in different types of triangles? • How are the angle measures and side lengths related in one and two triangles? • What is proof? • Why do we need proofs? • How do we prove _____? • Given _____, what can we conclude? • How is similarity of geometric figures applied and verified?	*Students will understand…* • Points, lines, and planes are the basis for our study of geometry. • Geometric transformations are functional relationships. • How to verify whether a conjecture is true or false. • The difference between the hypothesis and conclusion of a conditional statement. • How to justify steps in algebraic proofs. • Methods for proving triangles congruent. • Corresponding parts of congruent triangles. • Side length and angle measure relationships in triangles. *Students will know…* • Points • Lines • Segment • Parallel • Perpendicular • Planes • Rays • Rotation • Reflection • Translation • Slope Formula	• Classwork • Homework • Quizzes • Tests • District Assessment

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	draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. • G.CO.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. • G.CO.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. • G.CO.8 Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. • G.CO.9 Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.		• Distance Formula • Geometric construction *Students will be able to…* • Apply relationships between points, lines, and planes • Use the slope and distance formulas to prove geometric theorems and properties. • Find equations of parallel and perpendicular lines. • Identify parallel, perpendicular, and skew lines. • Identify the angles formed by two lines and a transversal. • Prove and use theorems about the angles formed by parallel lines and a transversal. • Prove and apply theorems about perpendicular lines • Find the slope of a line. • Use slopes to identify parallel and perpendicular lines. • Draw geometric figures to model a problem situation • Apply congruence, segment or angle addition, and algebraic reasoning to find measures of segments and angles. • Apply transformations to geometric figures in the coordinate plane. • Prove triangles and corresponding parts of congruent triangles are congruent.	

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	• G.CO.10 Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point. • G.CO.11 Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.			

Unit 2: Similarity and Proofs	• G.GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.
	• G.SRT.1 Verify experimentally the properties of dilations given by a center and a scale factor.
	  ○ A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
	  ○ The dilation of a line segment is
		• How is similarity of geometric figures applied and verified?
		• What is proof?
		• Why do we need proofs?
		• How do we prove _____?
		• Given _____, what can we conclude?
			Students will understand…
			• The difference between the hypothesis and conclusion of a conditional statement.
			• Classifications of triangles.
			• Measures in triangles.
			• Trigonometry can be used to find missing angle and side measures in right triangles.
			
			Students will know…
			• Acute triangle
			• Congruent polygons
			• Corollary
			• Equilateral triangle
				• Classwork
				• Homework
				• Quizzes
				• Tests
				• District Assessment

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	longer or shorter in the ratio given by the scale factor. • G.SRT.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. • G.SRT.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar. • G.C.1 Prove that all circles are similar • G.CO.10 Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180 degrees; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.*	• How are the side measures and angle measures related in different types of triangles?	• Exterior angle • Interior angle • Isosceles triangle • Obtuse triangle • Right triangle • Scalene triangle • Dilation • Scale factor • SSS • SAS • ASA • AAS *Students will be able to…* • Find the geometric mean between two numbers. • Classify triangles and find interior and exterior angle measures and side lengths based on the classification.	
Unit 3: Trigonometry	• G.SRT.4 Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean	• How are right triangles used to measure indirectly? • How are the relationships	*Students will understand…* • Trigonometry can be used to find missing angle and side measures in right triangles. *Students will know…*	• Classwork • Homework • Quizzes • Tests • District Assessment

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	Theorem proved using triangle similarity. • G.SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. • G.SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. • G.SRT.7 Explain and use the relationship between the sine and cosine of complementary angles. • G.SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.★ • dimensional objects generated by rotations of two-dimensional objects. • G.MG.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).*	between the sides and angles of oblique triangles used to measure indirectly?	• Angle of elevation • Angle of depression • Cosine • Geometric mean • Sine • Tangent • Trigonometric ratio *Students will be able to…* • Classify triangles and find interior and exterior angle measures and side lengths based on the classification. • Recognize and use trigonometric relationships from right triangles. • Explain relationship between sine and cosine of complementary angles. • Prove theorems about triangles using similarity and proportionality. • Solve triangle problems using congruence and similarity.	
Unit 4: Circles and Expressing Geometric Properties Through Equations	• G.GPE.1 Derive the equation of a circle of a given center and radius using Pythagroean Theorem; complete the square to find the center and radius of a circle given by the equation. • G.GPE.4 Use coordinates to prove	• How can the coordinate plane be used to prove and discuss geometric problems? • What are the	*Students will understand…* • Develop and apply formulas for the area and circumference of circles. • How parallel and perpendicular lines are related by their slope. • Geometric theorems can be	• Classwork • Homework • Quizzes • Tests • District Assessment

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	simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2). • G.GPE.5 Prove the slope criteria for parallel and perpendicular lines and uses them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point). • G.GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★ • G.C.2 Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angels on a diameter or right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.* • G.C.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	different geometric properties of circles?	modeled algebraically on the coordinate plane. • The relationship between central angles and chords. • The different angle relationships in circles. • Relationships that exist between the angles and sides of geometric figures can be proven. *Students will know…* • Inscribed • Circumscribed • Radius • Diameter • Chord • Arc • Radian *Students will be able to…* • Use parallel and perpendicular lines to solve geometric problems. • Prove different properties of parallelograms. • Use the coordinate plane and the distance formula to prove theorems and compute perimeter and area of polygons. • Identify different properties of circles.	

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	• C.C.5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and find the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector. • G.CO.11 Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.*			
Unit 5: Extending to Three Dimensions	• G.GMD.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments. • G.GMD.2 Solve problems using volume formulas for cylinders. Pyramids, cones, and spheres. • G.GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★ • G.MG.1 Use geometric shapes, their	• What is the difference between surface area and lateral area? • How are area and volume of similar figures related? • How can real-world scenarios be modeled geometrically?	*Students will understand…* • The difference between surface area and lateral area. • How the volume of a cone is related to the volume of a cylinder. • How the formulas for area and volume of a geometric figure are generated. • Many real-life models and scenarios can be exhibited and solved using geometric shapes and properties. *Students will know…* • Cylinder • Net	• Classwork • Homework • Quizzes • Tests • District Assessment

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	measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).* • G.MG.2 Use density concepts in modeling situations based on area and volume. (e.g. modeling a tree trunk or a human torso as a cylinder). • G.MG.3 Solve design problems using geometric methods. (e.g. designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).		• Polyhedron • Prism • Pyramid • Sphere • Surface • Cone • Area • Volume *Students will be able to…* • Classify three-dimensional figures according to their properties. • Describe objects using geometric, and measures. • Solve problems using the volume of geometric solids.	