WDHS Curriculum Map: created by
Course: Geometry   January 2012

Time Interval/ Content	Standards/ Strands	Essential Questions	Skills	Assessment
1st MP *Unit 1: Foundations for Geometry* *Holt Sections:* 1.1-1.4, 1.6 *Honors Geometry 3 weeks* *Adv Geometry 3 weeks* *ICR Geometry 3.5*	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.9. Prove theorems about lines and angles. G-CO.12. Make formal geometric constructions with a variety of tools and methods G-GPE.4. Use coordinates to prove simple geometric theorems algebraically. G-MG.1. Use geometric shapes, their measures, and their properties to describe objects G-MG.3. Apply geometric methods to solve design problems G-GPE.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula N-Q-3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	Can all terms be defined? Can all concepts be proven? Explain. How are points, lines, and planes related?	*Students will understand that…* • *Points, lines, and planes are the basis for our study of geometry.* • *Geometric transformations are functional relationships.* *Students will know…* *Points, Lines, Planes, Rays, measuring segments and angles, pairs of angles, formulas, distance and midpoint formulas, and transformations* *Students will be able to…* • *Apply relationships between points, lines, and planes* • *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 formulas for perimeter, area , and circumference.* • *Apply distance formula, midpoint formula, Pythagorean theorem, and transformations to geometric figures in the coordinate plane.*	Classwork Practice Homework Quizzes Tests • Students will determine locations of fossils and angles of positions of archeological finds using segment and angle measures in the coordinate plane. (Holt Geometry PG 34) • Students will calculate position of paving stones and a fountain in a patio using midpoint. The will calculate the cost of the stones using area. They will determine other patterns of stones using transformations. (Page 58)

Unit 2: Geometric Reasoning *Holt Sections*: 2.1, 2.2, 2.4-2.6 *Honors Geometry 2 weeks* *Adv Geometry 2 weeks* *Geometry 2 weeks*	G-CO.9. Prove theorems about lines and angles. A-REI.1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. A-REI.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	What is proof? Why do we need proofs? How do we prove _____? Given _____, what can we conclude?	*Students will understand…* • 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. *Students will know…* Inductive reasoning, counterexamples, Venn diagrams, properties of equality and congruence, and how to write two-column algebraic proofs. *Students will be able to…* • Use inductive reasoning to identify patterns and make conjectures • Find counterexamples to disprove conjectures • Apply reasoning skills to drawing Venn diagrams of number sets • Use properties of equality to write algebraic proofs • Identify properties of equality and congruence • Write two-column proofs	Classwork Practice Homework Quizzes Tests Performance Tasks: *"Pieces of Proof"* Students will sit in circle. They will individually solve and justify an equation and then exchange it with another student in the circle who will check and make corrections to their solution and then exchange back.
Unit 3: Parallel and Perpendicular Lines	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,	What angle relationships can be determined by two lines and a transversal?	*Students will understand…* • That parallel lines and a transversal can form several types of angles with specific	Classwork Practice Homework Quizzes

Holt Sections: 3.1-3.5 *Honors Geometry* *2.5 weeks* *Adv Geometry* *3 weeks* *Geometry* *3.5 weeks*	and distance around a circular arc. G-CO.4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. G-CO.12. Make formal geometric constructions with a variety of tools and methods G-GPE.5. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems G-MG.1. Use geometric shapes, their measures, and their properties to describe objects G-MG.3. Apply geometric methods to solve design problems N-Q-3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	What is slope and how can it be used to determine if lines are parallel, perpendicular, or neither?	relationships. • Relationships between lines in the same planes and in different planes • How to prove lines are parallel using angle relationships • How to apply theorems about perpendicular lines • How to find slope and use slope to determine if lines are parallel, perpendicular or neither. • Relationships between different equations for the same line. *Students will know…* Alternate exterior angles, alternate interior angles, corresponding angles, parallel lines, perpendicular bisector, perpendicular lines, same-side interior angles, slope, transversal *Students will be able to…* • 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	Tests Performance Tasks: A traffic engineer calculates the speed of vehicles as they pass a traffic light. While the light is green, a taxi passes at a constant speed. After 2 s the taxi is 132 ft past the light. After 5 s it is 330 ft past the light. a. Find the speed of the taxi in feet per second. b. Use the fact that 22 ft/s = 15 mi/h to find the taxi's speed in miles per hour.

| Unit 4: Triangle Congruence

Holt Sections:
4.1-4.6, 4.8

Honors Geometry
3.5 weeks

Adv Geometry
4 weeks

Geometry
4 weeks | 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.10. Prove theorems about triangles.

G-MG.1. Use geometric shapes, their measures, and their properties to describe objects

G-MG.3. Apply geometric methods to solve design problems | What does it mean for two figures to be congruent?

How are the side measures and angle measures related in different types of triangles? | *Students will understand…*
• *Classifications of triangles*
• *Measures in triangles*
• *Methods for proving triangles congruent*
• *Corresponding parts of congruent triangles*
• *Side length and angle measure relationships in triangles*

Students will know…
Acute triangle, congruent polygons, corollary, equilateral triangle, exterior angle, interior angle, isosceles triangle, obtuse triangle, right triangle, scalene triangle, SSS, SAS, ASA, AAS, HL, CPCTC

Students will be able to…
• *Classify triangles and find interior and exterior angle measures and side lengths based on the classification.*
• *Prove triangles and corresponding parts of congruent triangles are congruent* | Classwork
Practice
Homework
Quizzes
Tests
Performance Tasks:
  Students will use various types of triangles to create an origami swan. They will classify and describe the triangles used. (Holt page 238)

Students will design and plan to purchase the materials needed to build a doghouse. They will apply triangle congruence and properties of triangles to their design. (Holt PG 280) |
| *Unit 5:* Properties and Attributes of Triangles

Holt Sections:
5.5(No Indirect Proof)-5.8

Honors Geometry
2.5 weeks | G-SRT.4. Prove theorems about triangles.

G-SRT.5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures

G-SRT.8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems

G-MG.1. Use geometric shapes, their | How are the angle measures and side lengths related in one and two triangles?

How are the side lengths related in right triangles and special right triangles? | *Students will understand…*
• Properties of perpendicular bisectors and angle bisectors
• Special points, segments, and lines related to triangles
• Inequalities in one triangle and in two triangles.
• Pythagorean inequalities and special right triangles | Classwork
Practice
Homework
Quizzes
Tests
Performance Tasks:
Students will use properties of triangles to determine best routes for an airline. (Holt page 364) |

Adv Geometry *3 weeks* *Geometry* *3 weeks*	measures, and their properties to describe objects G-MG.3. Apply geometric methods to solve design problems		*Students will know…* Altitude of a triangle, centroid of a triangle, circumcenter of a triangle, concurrent, equidistant, incenter of a triangle, median of a triangle, midsegment of a triangle, orthocenter of a triangle, triangle inequalities, Pythagorean Theorem, special right triangles *Students will be able to…* • Apply theorems about perpendicular bisectors, angle bisectors, medians, altitudes and their properties in triangles. • Apply inequalities in one and two triangles. • Apply the Pythagorean Theorem and Pythagorean Inequalities. • Justify and apply properties of special right triangles.	
Unit 6: Polygons and Quadrilaterals *Holt Sections:* 6.1-6.6 *Honors Geometry* *3 weeks* *Adv Geometry* *4 weeks* *Geometry*	G-CO.11. Prove theorems about parallelograms G-CO.12. Make formal geometric constructions with a variety of tools and methods G-CO.13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle. G-GPE.4. Use coordinates to prove simple geometric theorems algebraically.	What are the properties of special quadrilaterals? How can the properties of geometric figures be verified using the coordinate plane?	*Students will understand…* Relationships that exist between the angles and sides of geometric figures can be proven. *Students will know…* • Concave • Convex • Diagonal • Isosceles Trapezoid • Kite • Parallelogram • Rectangle	Classwork Practice Homework Quizzes Tests Performance Task: Demonstrate your knowledge of special quadrilaterals by identifying them and using their properties to solve problems. (Holt Performance Task Chapter 6)

4 weeks	G-MG.1. Use geometric shapes, their measures, and their properties to describe objects G-MG.3. Apply geometric methods to solve design problems		• Regular Polygon • Rhombus • Square • Trapezoid *Students will be able to…* • Apply properties of polygons. • Apply properties of special quadrilaterals. • Show that a polygon is a special quadrilateral.	
Unit 7: Transformations & Similarity *Holt Sections:* 1.7 (Supplement with problems from 12.1-12.3), 7.1-7.6 *Honors Geometry 3 weeks* *Adv Geometry 4 weeks* *Geometry 4 weeks*	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 vs horizontal stretch). G-CO.4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. (Honors & Advanced) 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-SRT.2. Given two figures, use the	How is similarity of geometric figures applied and verified? How are area and volume of similar figures related?	*Students will understand…* Similar geometric figures have proportional attributes. *Students will know…* • Dilation • Proportion • Ratio • Scale • Scale Drawing • Scale Factor • Similar • Similar Polygons • Similarity Ratio *Students will be able to…* • Verify that polygons are similar using corresponding angles and sides. • Use properties of similar polygons. • Write proofs about similar polygons.	Classwork Practice Homework Quizzes Tests Performance Task: Students will calculate lengths of trains and buildings in a toy train set up so that they are proportional to actual trains and train stations. (Holt Text PG 478 Multi-Step Test Prep) Demonstrate your knowledge by locating point P in triangle PQR so that triangle ABC is similar to triangle PQR. (Holt Performance Assessment Chapter 7)

	definition of similarity in terms of similarity transformations to decide if they are similar G-SRT.3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar. 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-C.1. Prove that all circles are similar.		
Unit 8: Right Triangles & Trigonometry *Holt Sections:* 8.1-8.4 *Honors Geometry* *2 weeks* *Adv Geometry* *2 weeks* *Geometry* *2 weeks*	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.10. Prove theorems about triangles G-SRT.4. Prove theorems about triangles. 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	How are right triangles used to measure indirectly? How are the relationships between the sides and angles of oblique triangles used to measure indirectly?	*Students will understand…* Trigonometry can be used to find missing angle and side measures in right triangles. *Students will know…* • Angle of elevation • Angle of depression • Cosine • Geometric mean • Sine • Tangent • Trigonometric ratio *Students will be able to…* • Find the geometric mean between two numbers.	Classwork Practice Homework Quizzes Tests Performance Task: Utility workers install and repair the utility poles and wires that carry electricity from generating stations to consumers. As shown in the figure, a crew of workers plans to install a vertical utility pole *AC* and a supporting guy wire AB that is perpendicular to the ground. (Holt Text PG 478 Multi-Step Test Prep)

	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 G-GPE.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio. G- MG.1. Use geometric shapes, their measures, and their properties to describe objects G-MG.3. Apply geometric methods to solve design problems		• Recognize and use trigonometric relationships from right triangles.	Demonstrate your knowledge by finding triangle measures. (Holt Performance Assessment Ch 8)
Unit 9: Circles *Holt Sections:* 11.1-11.7 *Honors Geometry* *3 weeks* *Adv Geometry* *4 weeks* *Geometry* *4 weeks*	G-C-2 Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are 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. G-C-4(+) Construct a tangent line from a point outside a given circle to the circle.	Explain the relationship between central angles and chords. Explain how to find the area of a sector. Explain the different angle relationships in circles. What are the relationships between segments in a circle?	*Students will understand…* • The relationship between central angles and chords. • How to find the area of a sector. • The different angle relationships in circles. • The relationships between segments in a circle. *Students will know…* • Arc • Arc length • Central angle • Chord

			• Secant • Sector of a circle • Segment of a circle • Semicircle • Tangent of a circle *Students will be able to…* • Identify tangents, secants, and chords. • Use properties of tangents to solve problems. • Apply properties of arcs. • apply properties of chords • Find the area of sectors. • Find arc lengths. • Find the measure of an inscribed angle. • Use inscribed angles and their properties to solve problems. • Find the measures of angles formed by lines that intersect circles. • Use angle measures to solve problems. • Find the length of segments formed by lines that intersect circles. • Use the length of segments in circles to solve problems. • Write equations and graph circles in the coordinate plane. • Use the equation and graph of a circle to solve problems.	
	G-C-5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the ==RADIAN== measure of angles as the constant of proportionality; derive the formula for the area of a circle. G-GPE-1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.			
Unit 10: Extending Area & Perimeter	G-GPE-7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the	Explain the difference between area and perimeter.	*Students will understand…* • The difference between perimeter and area.	• Classwork • Practice

Holt Sections: 1.5, 9.1-9.5 *Honors Geometry* 2 weeks *Adv Geometry* 3 weeks *Geometry* 3 weeks	distance formula. G-MG-1 Use geometric shapes, their measures, and their properties to describe objects. G-MG-2 Apply concepts of density based on area and volume in modeling situations. G-MG-3 Apply geometric methods to solve design problems. ==G-GPE-2 Derive the equation of a parabola given a focus and directrix (*using the Distance Formula)==	Explain the process for finding the area of a composite figure. What are the effects on the area and perimeter of a figure if the dimensions of the figure are multiplied by *n*?	The effects on area and perimeter of a multiplier on the dimensions of a figure. *Students will know…* - Apothem - Center of a circle - Center of a regular polygon - Central angle of a regular polygon - Circle - Composite figure - Geometric probability *Students will be able to…* - Develop and apply formulas for the areas of triangles and special quadrilaterals. - Solve problems involving perimeters and areas of triangles and special quadrilaterals. - Develop and apply formulas for the area and circumference of a circle. - Develop and apply the formula for the area of a regular polygon. - Use the Area Addition Postulate to find the areas of composite figures. - Use composite figures to estimate the areas of irregular shapes. - Find the perimeters and areas of figures in the coordinate plane. - Describe the effect on perimeter and area when one more dimensions of a figure are changed. - Apply the relationship between perimeter and area in problem solving.	- Homework - Quizzes - Test - Project

Unit 11: Spatial Reasoning
 	
Holt Sections: 10.1-10.8
 	
Honors Geometry 2 weeks
 	
Adv Geometry 2 weeks
 	
Geometry 2 weeks
	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.
	
	G-GMD-2(+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.
	
	G-GMD-3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
	
	G-GMD-4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects generated by rotations of two-dimensional objects.
		Describe the difference between surface area and lateral area.
		Describe how the volume of a cone is related to the volume of a cylinder.
			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.
			
			Students will know…
			    • Cone
			    • Cylinder
			    • Net
			    • Polyhedron
			    • Prism
			    • Pyramid
			    • Sphere
			    • Surface area
			    • Volume
			
			Students will be able to…
			• Classify three-dimensional figures according to their properties.
			• Use nets and cross sections to analyze three-dimensional figures.
			• draw representations of three-dimensional figures
			• Recognize a three-dimensional figure from a given representation.
			• Use nets to create and explore properties of polyhedrons.
			• Apply Euler's formula to find the number of vertices, edges, and faces of a polyhedron.
			• Learn and apply the formula for the surface area of a prism
				CW
				HW
				Quizzes
				Test

			• Learn and apply the formula for the surface area of a cylinder. • Learn and apply the formula for the surface area of a pyramid. • Learn and apply the formula for the surface area of a cone. • Learn and apply the formula for the volume of a prism. • Learn and apply the formula for the volume of a cylinder. • Learn and apply the formula for the volume of a pyramid. • Learn and apply the formula for the volume of a cone. • Learn and apply the formula for the volume of a sphere. • Learn and apply the formula for the surface area of a sphere.	
<mark>*Unit 12: Probability*</mark> <mark>*Holt Sections: 9.6 NEED TO GET SUPPLEMENTARY MATERIALS*</mark>	S-CP 1: Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). S-CP 2: Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. S-CP 3: Understand the conditional probability of A given B as $P(A$ and $B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A	How can we determine the probability of an event occurring?	*Students will understand that…* • Probability is the chance an event occurs. • Conditional probability in terms of real-world situations. *Students will know…* • Probability Experiment • Outcome • Sample Space • Event • Simple Event • Complement of Event • Conditional Probability • Independent • Dependent • Two-way frequency table • Addition Rule	CW HW Quizzes Test

given *B* is the same as the probability of *A*, and the conditional probability of *B* given *A* is the same as the probability of *B*. S-CP 5: Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. S-CP 6: Find the conditional probability of *A* given *B* as the fraction of *B*'s outcomes that also belong to *A,* and interpret the answer in terms of the model. S-CP 7: Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.		*Students will be able to…* • Identify the Sample Space of a probability experiment and to identify simple events • Find the probability of the complement of an event and how to find other probabilities using tree diagrams • Find conditional probabilities using a two-way frequency table • Distinguish between independent and dependent events • Use the Additional Rule to find the probability of two events • Calculate geometric probabilities. • Use geometric probability to predict results in real-world situations	