

Geometry Curriculum Map

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Units of Study	Days	Standards	Essential Questions
Unit 1: -Essentials of Geometry -Reasoning and Proof -Parallel and Perpendicular Lines	45	Congruence HSG-CO.C.9-11: Prove geometric theorems 9. Prove theorems about lines and angles. 10. Prove theorems about triangles. 11. Prove theorems about parallelograms. HSG-CO.D.12: Make Geometric Constructions 12. Make formal geometric constructions with a variety of tools and methods	What does it mean to prove a statement is true? How do we construct viable arguments?
Unit 2: -Transformations -Congruent Triangles -Relationships within Triangles, Quadrilaterals and Polygons	45	Congruence HSG-CO.A.1-5: Experiment with transformations in the plane 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. 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 3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. 4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. 5. Given a geometric figure and a rotation, reflection, or translation, 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. HSG-CO.B.6-8: Understand congruence in terms of rigid motion 6. Use geometric descriptions of rigid motions to transform figures and	How do transformations affect congruence of figures?

<p>Unit 3: -Similarity -Right Triangles & Trigonometry</p>		<p>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.</p> <p>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.</p> <p>8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.</p>	<p>How does similarity affect the transformation of figures?</p>
	<p>30</p>	<p>Similarity, Right Triangles and Trigonometry</p> <p>HSG-SRT.A.1-3: Understand similarity in terms of similarity transformations</p> <ol style="list-style-type: none"> 1. (a) 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. (b) The dilation of a line segment is longer or shorter in the ratio given by the scale factor. 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. 3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar. <p>HHSG-SRT.B.4-5: Prove theorems involving similarity</p> <ol style="list-style-type: none"> 4. Prove theorems about triangles. 5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. <p>HSG-SRT.C.6-8: Define trigonometric ratios and solve problems involving right triangles</p> <ol style="list-style-type: none"> 6. Understand that by similarity, side ratios in right triangles are 	

		<p>properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.</p> <p>7. Explain and use the relationship between the sine and cosine of complementary angles.</p> <p>8. Explain and use the relationship between the sine and cosine of complementary angles.</p> <p>HSG-SRT.D.9-11: Apply trigonometry to general triangles</p> <p>9. (+) Derive the formula $A = \frac{1}{2} ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.</p> <p>10. (+) Prove the Laws of Sines and Cosines and use them to solve problems.</p> <p>11. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles</p>	<p>How can we use properties of circles to recognize relationships between and within circles?</p>
<p>Unit 4: -Properties of Circles</p>	<p>15</p>	<p style="text-align: center;">Circles</p> <p>HSG-C.A.1-4: Understand and apply theorems about Circles</p> <ol style="list-style-type: none"> 1. Prove that all circles are similar 2. Identify and describe relationships among inscribed angles, radii, and chords. 3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. 4. (+) Construct a tangent line from a point outside a given circle to the circle. <p>HSG-C.B.5: Find arc lengths and areas of sectors of circles</p> <ol style="list-style-type: none"> 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 the angle as the constant of proportionality; derive the formula for the area of a sector. 	<p>How does what we measure influence how we measure?</p>

<p>Unit 5: -Measuring Length and Area -Surface Area and Volume</p>	<p>30</p>	<p>Geometric Measurement and Dimension HSG-GMD.A.1-3: Explain Volume formulas and use them to solve problems</p> <ol style="list-style-type: none"> 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. 2. (+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures. 3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. <p>HSG-GMD.B.4: Visualize relationships between two dimensional and three dimensional objects</p> <ol style="list-style-type: none"> 4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. 	<p>How can we interpret patterns to make decisions?</p>
<p>Unit 6: -Probability</p>	<p>15</p>	<p>Using Probability to Make Decisions HSS-MD.B.6-7: Use Probability to evaluate outcomes of decisions</p> <ol style="list-style-type: none"> 6. (+) Use Probability to make fair decisions 7. (+) Analyze decisions and strategies using probability concepts 	