

**Diocese of Bridgeport**  
**Curriculum Map**

**Course: Geometry**

**Grade Level: 9/10**

<b>Content</b>	<b>Skills</b>	<b>Suggested Assessments</b>	<b>Connecticut Content Standards</b>
Structure of geometry	<ul style="list-style-type: none"> <li>Understand the difference between definitions, postulates, and theorems.</li> <li>Use the Ruler and Segment Addition Postulates.</li> <li>Use the Protractor and Angle Addition Postulate.</li> <li>Understand the structure of conditional statements and the relationships between it's converse, inverse, and contra positive.</li> <li>Identify and use the properties of congruence. (Reflexive, Symmetric, and Transitive)</li> <li>Explore the different types of geometry and topology.</li> </ul>	<ul style="list-style-type: none"> <li>Have the students draw lines segments and angles to apply the elementary postulates.</li> <li>Give coordinate geometry problems to solve to show the graphical relationships of algebra and geometry.</li> <li>Have assignments that stress the concepts of slope and analytic geometry.</li> <li>Use constructions with the compass and straightedge to strengthen geometry concepts.</li> <li>Give problems dealing with measurements of different types.</li> </ul>	<ul style="list-style-type: none"> <li>Geometric constructions, either with drawing tools or software, can be used to investigate relationships among plane geometric figures.</li> <li>Geometric theorems (statements that can be proven) may be discovered using inductive reasoning and proved using deductive reasoning.</li> </ul>
Symmetry	<ul style="list-style-type: none"> <li>Understand the different types of symmetry.</li> <li>Use the midpoint and distance formulas.</li> </ul>	<ul style="list-style-type: none"> <li>Have students makes graphs to show the different types of symmetry.</li> </ul>	<ul style="list-style-type: none"> <li>Geometric constructions, either with drawing tools or software, can be used to investigate relationships among plane geometric figures.</li> </ul>
Deductive reasoning and proofs	<ul style="list-style-type: none"> <li>Develop the basic concepts of types of reasoning.</li> <li>Understand the laws of logic such as the law of syllogism.</li> <li>Use deductive arguments, including direct and indirect proofs, to develop an understanding of an axiomatic approach to geometry.</li> <li>Know the angle theorems and apply their use.</li> </ul>	<ul style="list-style-type: none"> <li>Give a number of algebraic problems dealing with congruent, complementary, supplementary, and vertical angles.</li> <li>Assign a number of logic problems to have students develop a step by step approach to solve problems.</li> </ul>	<ul style="list-style-type: none"> <li>Geometric theorems (statements that can be proven) may be discovered using inductive reasoning and proved using deductive reasoning.</li> </ul>
Lines & planes	<ul style="list-style-type: none"> <li>Understand the properties of parallel and perpendicular lines and planes.</li> <li>Know the relationships of angles formed by intersecting lines.</li> <li>Be able to prove when lines are parallel.</li> <li>Use vectors to represent the two concepts of direction and length.</li> </ul>	<ul style="list-style-type: none"> <li>Give exercises to apply lines in geometry to equations in algebra including the graphs of parallel and perpendicular lines.</li> <li>Have the students make drawings of parallel and perpendicular planes to visualize their relationships.</li> <li>Give some practice SAT problems.</li> </ul>	<ul style="list-style-type: none"> <li>Geometric relationships may be verified and proved using synthetic, coordinate, and transformation methods.</li> <li>Algebraic concepts can be extended from real numbers to include objects such as complex numbers, vectors, and matrices.</li> </ul>

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Congruence and triangles	<ul style="list-style-type: none"> <li>Understand the concept and properties of congruent figures.</li> <li>Be able to distinguish the different types of triangles and their properties.</li> <li>Find the interior and exterior angles of a triangle.</li> <li>Be able to develop proofs that triangles are congruent.</li> <li>Prove corresponding parts of congruent triangles are congruent.</li> </ul>	<ul style="list-style-type: none"> <li>Have students investigate when triangles are congruent and not congruent.</li> <li>Give exercises where the students use protractors to verify the theorems about triangle angles.</li> <li>Give assignments using real life examples of how to use congruent triangles to prove segment and angle measures.</li> </ul>	<ul style="list-style-type: none"> <li>Geometric constructions, either with drawing tools or software, can be used to investigate relationships among plane geometric figures.</li> </ul>
Properties of triangles	<ul style="list-style-type: none"> <li>Identify the segments of a triangle such as median, altitude, angle bisector, etc.</li> <li>Be able to draw and identify properties of inscribed and circumscribed circles and triangles.</li> <li>Use the Midsegment Theorem.</li> <li>Use the Inequalities Theorems of triangles.</li> <li>Determine the properties between the sides of a triangle.</li> <li>Use the Hinge Theorems.</li> </ul>	<ul style="list-style-type: none"> <li>Give examples using coordinate geometry to strengthen the geometric properties learned.</li> <li>Have the students determine some real life situations where these properties are used.</li> <li>Have the students use constructions to identify the relationships of circumscribed and inscribed circles of triangles.</li> <li>Give some practice SAT problems.</li> </ul>	<ul style="list-style-type: none"> <li>Geometric constructions, either with drawing tools or software, can be used to investigate relationships among plane geometric figures.</li> <li>Geometric relationships may be verified and proved using synthetic, coordinate, and transformation methods.</li> </ul>
Polygons	<ul style="list-style-type: none"> <li>Identify the types of polygons and their basic properties.</li> <li>Find the measures of interior and exterior angles of a polygon.</li> <li>Identify the properties of parallelograms.</li> <li>Be able to prove when quadrilaterals are parallelograms.</li> <li>Determine when parallelograms are rhombi, rectangles, and squares and identify their properties.</li> <li>Identify the properties of trapezoids.</li> <li>Use the Midsegment Theorem for Trapezoids.</li> <li>Identify the properties of kites.</li> </ul>	<ul style="list-style-type: none"> <li>Use coordinate geometry to demonstrate the properties of parallelograms and to prove when quadrilaterals are parallelograms.</li> <li>Use many algebraic problems in applications of polygons.</li> <li>Give some practice SAT problems.</li> </ul>	<ul style="list-style-type: none"> <li>Geometric relationships may be verified and proved using synthetic, coordinate, and transformation methods.</li> <li>A variety of coordinate systems and transformations may be used to solve geometric problems in two- and three-dimensional geometry.</li> </ul>

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Similarity	<ul style="list-style-type: none"> <li>• Compute ratios and proportions.</li> <li>• Use the properties of proportions.</li> <li>• Identify similar polygons and use their properties.</li> <li>• Use the AA Similarity Theorem.</li> <li>• Identify and prove when triangles are similar.</li> <li>• Use proportions in similar triangles.</li> <li>• Use the Proportionality Theorems and their converses in finding segment lengths in triangles.</li> </ul>	<ul style="list-style-type: none"> <li>• Have students use scale factors in problems involving real life figures and architecture.</li> <li>• Give many practical problems finding distances using similar triangles.</li> <li>• Give some practice SAT problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Measurements that are not directly determined can be approximated with some degree of precision.</li> </ul>
Right triangles & special right triangles.	<ul style="list-style-type: none"> <li>• Find the geometric mean.</li> <li>• Use properties of right triangles.</li> <li>• Use congruent right triangles.</li> <li>• Prove the Pythagorean Theorem.</li> <li>• Apply the Pythagorean Theorem.</li> <li>• Use the converse to the Pythagorean Theorem.</li> <li>• Know and use the properties of special right triangles (45-45-90 &amp; 30-60-90).</li> </ul>	<ul style="list-style-type: none"> <li>• Have the students explore different proofs to the Pythagorean Theorem.</li> <li>• Give many examples of the Pythagorean Theorem and special right triangles for the SAT exam.</li> </ul>	<ul style="list-style-type: none"> <li>• Geometric theorems and trigonometric relationships may be used to solve a variety of problems involving one- two- and three-dimensional measurements.</li> </ul>
Trigonometry	<ul style="list-style-type: none"> <li>• Identify the trigonometric ratios.</li> <li>• Use the trigonometric ratios to find the sides and angles in right triangles.</li> <li>• Apply trigonometric ratios to word problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Use calculators to find the trigonometric ratios and use them in problems.</li> <li>• Give many real life problems using the trigonometric ratios.</li> <li>• Give some practice SAT problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Geometric theorems and trigonometric relationships may be used to solve a variety of problems involving one- two- and three-dimensional measurements.</li> </ul>
Circles	<ul style="list-style-type: none"> <li>• Identify the parts of circles.</li> <li>• Use tangents and secants in circles.</li> <li>• Use the properties of tangents.</li> <li>• Find the measures of central angles and arcs in a circle.</li> <li>• Know the relationships between arcs and chords.</li> <li>• Use inscribed angles.</li> <li>• Find the angles formed by chords, tangent segments, and secant segments.</li> <li>• Find the equation of a circle.</li> </ul>	<ul style="list-style-type: none"> <li>• Give many problems applying circles and their properties in real life situations.</li> <li>• Give SAT exam samples questions dealing with circles.</li> <li>• Use coordinate geometry to find equations and inequalities of circles and their graphs.</li> </ul>	<ul style="list-style-type: none"> <li>• Geometric relationships may be verified and proved using synthetic, coordinate, and transformation methods.</li> </ul>

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Plane areas and perimeters	<ul style="list-style-type: none"> <li>• Find the perimeter of polygons.</li> <li>• Find the area of rectangles and squares.</li> <li>• Find the area of triangles.</li> <li>• Find the area of parallelograms.</li> <li>• Find the area of trapezoids.</li> <li>• Find the area of other quadrilaterals and regular polygons.</li> <li>• Use the area of certain polygons to find the area of more complex figures.</li> <li>• Find the perimeter and area of a circle.</li> <li>• Find the area of sectors and segments.</li> <li>• Compute the perimeters and areas of similar figures.</li> </ul>	<ul style="list-style-type: none"> <li>• Give practical problems involving perimeter and areas that make the students use measurements.</li> <li>• Have students see the affects of changes in measurements of parts of a polygon in areas.</li> <li>• Use some more SAT practice problems involving areas.</li> <li>• Have the students research the development of <math>\pi</math>.</li> <li>• Use area problems to compute probabilities such as the chance of hitting a target on a dart board.</li> </ul>	<ul style="list-style-type: none"> <li>• Geometric constructions, either with drawing tools or software, can be used to investigate relationships among plane geometric figures.</li> <li>• Geometric theorems and trigonometric relationships may be used to solve a variety of problems involving one- two- and three-dimensional measurements.</li> <li>• Measurements that are not directly determined can be approximated with some degree of precision.</li> </ul>
Solid figures and volumes	<ul style="list-style-type: none"> <li>• Identify polyhedrons.</li> <li>• Find the surface area and volumes of prisms and cylinders.</li> <li>• Find the length of segments in pyramids and cones.</li> <li>• Find the surface area and volumes of pyramids and cones.</li> <li>• Find the surface area and volume of spheres.</li> <li>• Compare the volumes of similar solids.</li> </ul>	<ul style="list-style-type: none"> <li>• Use models to have students make conjectures and visualize solids.</li> <li>• Give problems dealing with more complex figures in combining different solids such as prisms with cylindrical holes.</li> <li>• Have students draw three-dimensional geometric objects.</li> <li>• Have students see the affects of changes in measurements of parts of a polygon in volumes.</li> <li>• Give practical problems involving volumes in solids.</li> <li>• Have students make estimates of areas and volumes.</li> <li>• Give some volume practice SAT problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Geometric constructions, either with drawing tools or software, can be used to investigate relationships among plane geometric figures.</li> <li>• Geometric theorems and trigonometric relationships may be used to solve a variety of problems involving one- two- and three-dimensional measurements.</li> <li>• A variety of coordinate systems and transformations may be used to solve geometric problems in two- and three-dimensional geometry.</li> </ul>
Loci	<ul style="list-style-type: none"> <li>• Find the locus in a plane.</li> <li>• Determine the loci in space.</li> <li>• Use loci in problem solving with some real life applications</li> <li>• Find the cross sections of solids using loci.</li> </ul>	<ul style="list-style-type: none"> <li>• Give constructions to apply the concepts of loci.</li> <li>• Have problems involving graphing with loci.</li> </ul>	<ul style="list-style-type: none"> <li>• A variety of coordinate systems and transformations may be used to solve geometric problems in two- and three-dimensional geometry.</li> </ul>

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Transformations	<ul style="list-style-type: none"> <li>• Identify transformations.</li> <li>• Use reflections and symmetry.</li> <li>• Use rotations.</li> <li>• Use translations and glide reflections.</li> </ul>	<ul style="list-style-type: none"> <li>• Use coordinate geometry to reinforce transformations.</li> <li>• Use some real life problems to demonstrate transformations and their use.</li> </ul>	<ul style="list-style-type: none"> <li>• Geometric relationships may be verified and proved using synthetic, coordinate, and transformation methods.</li> <li>• A variety of coordinate systems and transformations may be used to solve geometric problems in two- and three-dimensional geometry.</li> </ul>