

Southern Cayuga Central School District – Curriculum Map

Subject: Geometry School Year: 2022-2023

Title or Topics w/ NYS Standards	Essential Questions & Vocabulary	Content Skills (Activities to cover Essential Questions)	Major Assessments (Tests, Project, etc.)	Time Frame
<p>Essential Geometric Terms and Concepts</p> <p>GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.</p> <p>GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.</p> <p>GEO-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.</p> <p>GEO-G.CO.8. Explain how the criteria for triangle congruence (ASA, SAS, SSS, AAS and HL (Hypotenuse Leg)) follow from the definition of congruence in terms of rigid motions.</p>	<p>Congruence</p> <p>Rigid Motions</p> <p>Circles and Arcs</p> <p>Measure</p> <p>Axiom</p> <p>Theorem</p> <p>Perpendicular/Parallel</p> <p>How can we prove without measuring with traditional measuring tools that two objects are the same size and shape?</p> <p>What does it mean to be congruent?</p>	<ul style="list-style-type: none"> ● Points, Distances and Segments ● Lines, Rays and Angles ● Types of Angles ● Complements and Supplements ● Circles and Arcs ● Constructing a Triangle Given its Sides ● Additional Geometric Terminology ● More Properties of Lines 	<p>Observations Homework</p> <p>Checkpoint quizzes</p> <p>Chapter assessments</p> <p>Self Assessment (Possibly Projects)</p>	<p>12-14 Days</p>

<p>GEO-G.CO.9. Prove and apply theorems about lines and angles.</p> <p>GEO-G.CO.10. Prove and apply theorems about triangles. Make geometric constructions.</p> <p>GEO-G.CO.12. Make, justify, and apply formal geometric constructions.</p> <p>GEO-G.CO.13. Make and justify the constructions for inscribing an equilateral triangle, a square and a regular hexagon in a circle.</p> <p>GEO-G.SRT.5. Use congruence and similarity criteria for triangles to:</p> <p>GEO-G.SRT.5.a. Solve problems algebraically and geometrically.</p> <p>GEO-G.SRT.5.b. Prove relationships in geometric figures.</p> <p>GEO-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 that similar triangles have equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.</p> <p>GEO-G.GPE.6. Find the point on a directed</p>	<p>Is congruent the same as equal?</p>			
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<p>line segment between two given points that partitions the segment in a given ratio.</p>				
<p>Transformations, Rigid Motions and Congruence GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane. GEO-G.CO.2. Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not. GEO-G.CO.3. Given a regular or irregular polygon, describe the rotations and reflections (symmetries) that carry the polygon onto itself. GEO-G.CO.4.</p>	<p>Rigid Motions</p> <p>Proofs</p> <p>Why do we call certain transformations “rigid motions?”</p>	<ul style="list-style-type: none"> ● Transformations ● Rotations ● Reflections ● Isosceles Triangles ● Translations ● Congruence and Rigid Motions ● Basic Rigid Motion Proofs ● Congruence Reasoning About Triangles ● Symmetries of a Figure 	<p>Observations Homework Checkpoint quizzes Chapter assessments Self Assessment (Possibly Projects)</p>	<p>10-12 Days</p>

<p>Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments. GEO-G.SRT.5. Use congruence and similarity criteria for triangles to: GEO-G.SRT.5.b. Prove relationships in geometric figures. GEO-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. GEO-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. GEO-G.SRT.1. Verify experimentally the properties of dilations given by a center and a scale factor.</p>				
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<p>GEO-G.SRT.1.a. Verify experimentally that 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.</p> <p>GEO-G.SRT.1.b. Verify experimentally that the dilation of a line segment is longer or shorter in the ratio given by the scale factor.</p> <p>GEO-G.CO.9. Prove and apply theorems about lines and angles.</p> <p>GEO-G.CO.10. Prove and apply theorems about triangles.</p> <p>GEO-G.CO.12. Make, justify, and apply formal geometric constructions.</p> <p>GEO-G.CO.13. Make and justify the constructions for inscribing an equilateral triangle, a square and a regular hexagon in a circle.</p>				
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<p>Euclidean Triangle Proof</p> <p>GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.</p> <p>GEO-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.</p> <p>GEO-G.CO.8. Explain how the criteria for triangle congruence (ASA, SAS, SSS, AAS and HL (Hypotenuse Leg)) follow from the definition of congruence in terms of rigid motions.</p> <p>GEO-G.CO.9. Prove and apply theorems about lines and angles.</p> <p>GEO-G.CO.10. Prove and apply theorems about triangles.</p> <p>GEO-G.GPE.6.</p>	<p>Corresponding Parts</p> <p>What are the requirements to prove a pair of triangles are congruent?</p>	<ul style="list-style-type: none"> ● Drawing Inferences from Givens ● The Axioms of Equality ● Triangle Congruence Theorems ● CPCTC ● Proofs with Partitioning ● More Work with Parallel Lines ● AAS and Isosceles Triangles ● Hypotenuse-Leg ● Additional Triangle Proof 	<p>Observations Homework Checkpoint quizzes Chapter assessments Self Assessment (Possibly Projects)</p>	<p>10-14 Days</p>
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<p>Find the point on a directed line segment between two given points that partitions the segment in a given ratio. GEO-G.SRT.5. Use congruence and similarity criteria for triangles to: GEO-G.SRT.5.a. Solve problems algebraically and geometrically. GEO-G.SRT.5.b. Prove relationships in geometric figures.</p>				
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<p>Constructions</p> <p>GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.</p> <p>GEO-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.</p> <p>GEO-G.CO.8. Explain how the criteria for triangle congruence (ASA, SAS, SSS, AAS and HL (Hypotenuse Leg)) follow from the definition of congruence in terms of rigid motions.</p> <p>GEO-G.CO.9. Prove and apply theorems about lines and angles.</p> <p>GEO-G.CO.10. Prove and apply theorems about triangles.</p> <p>GEO-G.CO.12. Make, justify, and apply</p>	<p>Bisector</p> <p>Inscribed</p> <p>Circumscribed</p> <p>Regular</p> <p>What uses do we have for inscribed and/or circumscribed objects?</p>	<ul style="list-style-type: none"> ● Introduction to Constructions ● Constructing Angles and Parallel Lines ● Constructing Perpendicular Lines ● The Circumscribed Circle ● Bisecting an Angle ● The Inscribed Circle of a Triangle ● Inscribing Regular Polygons 	<p>Observations Homework</p> <p>Checkpoint quizzes</p> <p>Chapter assessments</p> <p>Self Assessment (Possibly Projects)</p>	<p>10-12 Days</p>
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<p>formal geometric constructions. GEO-G.CO.13. Make and justify the constructions for inscribing an equilateral triangle, a square and a regular hexagon in a circle. GEO-G.SRT.5. Use congruence and similarity criteria for triangles to: GEO-G.SRT.5.b. Prove relationships in geometric figures. GEO-G.C.2b. Identify, describe and apply relationships among radii, chords, tangents, and secants of a circle. GEO-G.C.5. Using proportionality, find one of the following given two others; the central angle, arc length, radius or area of sector.</p>				
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<p>The Tools of Coordinate Geometry</p> <p>GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.</p> <p>GEO-G.CO.2. Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.</p> <p>GEO-G.CO.3. Given a regular or irregular polygon, describe the rotations and reflections (symmetries) that carry the polygon onto itself.</p> <p>GEO-G.CO.4. Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.</p> <p>GEO-G.CO.5. Given a geometric figure and a rotation, reflection, or translation,</p>	<p>Perpendicular slopes</p> <p>What advantages does Point-Slope form offer us?</p> <p>Why is The Pythagorean Theorem useful in non right triangles?</p>	<ul style="list-style-type: none"> ● Slope and Parallelism ● Slope and Perpendicularity ● Equations of Lines ● The Point-Slope Form of a Line ● Horizontal and Vertical Lines ● The Pythagorean Theorem ● The Distance Formula ● The Midpoint Formula ● Rotations in the Coordinate Plane ● Reflections in the Coordinate Plane ● Translations in the Coordinate Plane 	<p>Observations Homework Checkpoint quizzes Chapter assessments Self Assessment (Possibly Projects)</p>	<p>13-15 Days</p>
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<p>draw the transformed figure. Specify a sequence of transformations that will carry a given figure onto another.</p> <p>Understand congruence in terms of rigid motions.</p> <p>GEO-G.CO.6.</p> <p>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.</p> <p>GEO-G.CO.10.</p> <p>Prove and apply theorems about triangles.</p> <p>GEO-G.GPE.1a.</p> <p>Derive the equation of a circle of given center and radius using the Pythagorean Theorem.</p> <p>Find the center and radius of a circle, given the equation of the circle.</p> <p>GEO-G.GPE.5.</p> <p>On the coordinate plane:</p> <p>GEO-G.GPE.5.a.</p> <p>Explore the proof for the relationship between slopes of parallel and perpendicular lines;</p>				
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<p>GEO-G.GPE.5.b. Determine if lines are parallel, perpendicular, or neither, based on their slopes; and</p> <p>GEO-G.GPE.5.c. Apply properties of parallel and perpendicular lines to solve geometric problems.</p> <p>GEO-G.GPE.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</p> <p>GEO-G.GPE.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.</p> <p>GEO-G.SRT.6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of sine, cosine and tangent ratios for acute angles.</p> <p>GEO-G.SRT.8. Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.</p>				
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<p>Quadrilaterals</p> <p>GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.</p> <p>GEO-G.CO.11. Prove and apply theorems about parallelograms.</p> <p>GEO-G.SRT.5. Use congruence and similarity criteria for triangles to:</p> <p>GEO-G.SRT.5.b. Prove relationships in geometric figures.</p> <p>GEO-G.GPE.5. On the coordinate plane:</p> <p>GEO-G.GPE.5.a. Explore the proof for the relationship between slopes of parallel and perpendicular lines;</p> <p>GEO-G.GPE.5.b. Determine if lines are parallel, perpendicular, or neither, based on their slopes; and</p> <p>GEO-G.GPE.5.c. Apply properties of parallel and perpendicular lines to solve geometric problems.</p>	<p>What is a Parallelogram and what is needed to prove it?</p>	<ul style="list-style-type: none"> ● Trapezoids and Parallelograms ● Properties of Parallelograms ● What makes a Parallelogram ● The Midpoints of a Triangle ● Rectangles ● The Rhombus ● Squares 	<p>Observations Homework Checkpoint quizzes Chapter assessments Self Assessment (Possibly Projects)</p>	<p>9-12 Days</p>
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<p>GEO-G.GPE.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</p> <p>GEO-G.GPE.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.</p>				
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<p>Dilations and Similarity GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane. GEO-G.CO.2. Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not. Understand congruence in terms of rigid motions. GEO-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. GEO-G.CO.1.</p>	<p>Similar Figures</p> <p>How does Similarity relate to Congruence?</p> <p>Why are Dilations not rigid Motions?</p>	<ul style="list-style-type: none"> ● Dilations ● Dilations in the Coordinate Plane ● Dilations and Angles ● Similarity ● Similarity Criteria ● Reasoning with Similarity ● More Similarity Reasoning ● The Side Splitter Theorem ● Partitioning a Line Segment ● The Medians of a Triangle ● Right Triangles Similarity ● Proving the Pythagorean Theorem 	<p>Observations Homework Checkpoint quizzes Chapter assessments Self Assessment (Possibly Projects)</p>	<p>15-17 Days</p>
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<p>Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane. GEO-G.CO.2. Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not. Understand congruence in terms of rigid motions. GEO-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. GEO-G.SRT.1. Verify experimentally the properties of dilations given by a</p>				
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<p>center and a scale factor. GEO-G.SRT.1.a. Verify experimentally that 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. GEO-G.SRT.1.b. Verify experimentally that the dilation of a line segment is longer or shorter in the ratio given by the scale factor .GEO-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 that similar triangles have equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. GEO-G.SRT.3. Use the properties of similarity transformations to establish the AA~, SSS~, and SAS~ criterion for two triangles to be similar. GEO-G.SRT.4. Prove and apply</p>				
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<p>similarity theorems about triangles. GEO-G.SRT.5. Use congruence and similarity criteria for triangles to: GEO-G.SRT.5.a. Solve problems algebraically and geometrically. GEO-G.SRT.5.b. Prove relationships in geometric figures. GEO-G.SRT.8. Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems. GEO-G.GPE.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio. GEO-G.GPE.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.</p>				
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<p>Right Triangle Trigonometry GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane. Prove geometric theorems. GEO-G.CO.10. Prove and apply theorems about triangles. GEO-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 that similar triangles have equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. GEO-G.SRT.3. Use the properties of similarity transformations to establish the AA~, SSS~, and SAS~ criterion for</p>	<p>Trigonometry</p> <p>Sine, Cosine and Tangent</p> <p>How can we use Trigonometry to find distances?</p>	<ul style="list-style-type: none"> ● Similar Right Triangles ● The Trigonometric Ratios ● Trigonometry and the Calculator ● Solving for Missing Sides of a Right Triangle ● Trigonometric Applications ● More Trig Applications 	<p>Observations Homework Checkpoint quizzes Chapter assessments Self Assessment (Possibly Projects)</p>	<p>8-10 Days</p>
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<p>two triangles to be similar.</p> <p>GEO-G.SRT.5. Use congruence and similarity criteria for triangles to:</p> <p>GEO-G.SRT.5.a. Solve problems algebraically and geometrically.</p> <p>GEO-G.SRT.5.b. Prove relationships in geometric figures.</p> <p>GEO-G.SRT.7. Explain and use the relationship between the sine and cosine of complementary angles.</p> <p>GEO-G.SRT.8. Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.</p> <p>GEO-G.GPE.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</p> <p>GEO-G.GPE.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.</p>				
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<p>Circle Geometry GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane. GEO-G.CO.10. Prove and apply theorems about triangles. GEO-G.CO.12. Make, justify, and apply formal geometric constructions. GEO-G.CO.13. Make and justify the constructions for inscribing an equilateral triangle, a square and a regular hexagon in a circle.</p> <p>GEO-G.C.2a. Identify, describe and apply relationships between the angles and their intercepted arcs of a circle. GEO-G.C.2b. Identify, describe and apply relationships among radii, chords, tangents, and secants of a circle. GEO-G.C.5.</p>	<p>Chords</p> <p>Tangents</p> <p>Secants</p>	<ul style="list-style-type: none"> ● Circle Terminology ● Inscribed Angles ● More Work with Inscribed Angles ● Intersecting Chords ● Tangents to a Circle ● Tangents, Secants and Their Angles ● Tangent and Secant Proofs and Practice ● Secant and Tangent Lengths ● Equations of Circles ● Placing Circles in Standard Form ● Constructing Tangents ● Equations of Tangent Lines 	<p>Observations Homework Checkpoint quizzes Chapter assessments Self Assessment (Possibly Projects)</p>	<p>14-16 Days</p>
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<p>Using proportionality, find one of the following given two others; the central angle, arc length, radius or area of sector. GEO-G.SRT.5.</p> <p>Use congruence and similarity criteria for triangles to: GEO-G.SRT.5.b.</p> <p>Prove relationships in geometric figures. GEO-G.GPE.1a.</p> <p>Derive the equation of a circle of given center and radius using the Pythagorean Theorem. Find the center and radius of a circle, given the equation of the circle. GEO-G.GPE.6.</p> <p>Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</p>				
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<p>Measurement and Modeling</p> <p>GEO-G.CO.1. Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.</p> <p>GEO-G.CO.10. Prove and apply theorems about triangles.</p> <p>GEO-G.SRT.6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of sine, cosine and tangent ratios for acute angles.</p> <p>GEO-G.SRT.8. Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.</p> <p>GEO-G.SRT.9. Justify and apply the formula $A = \frac{1}{2}ab \sin(C)$ to find the area of any triangle by drawing an auxiliary line from a vertex perpendicular to</p>	<p>Truncated Cone</p> <p>Radians</p> <p>What uses do we have for cross sectional measurements?</p> <p>Why are Sectors of a Circle so important?</p>	<ul style="list-style-type: none"> ● Perimeter ● The Circumference of a Circle ● The Area of Polygons ● The Area of Circle ● Sectors of Circles ● Radian Angle Measurement ● Solids and their Cross Sections ● Volumes of Prisms and Cylinders ● The Volume of Pyramids and Cones ● Spheres ● The Volume of a Truncated Cone 	<p>Observations Homework Checkpoint quizzes Chapter assessments Self Assessment (Possibly Projects)</p>	<p>14-16 Days</p>
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<p>the opposite side. GEO-G.C.1. Prove that all circles are similar.</p> <p>GEO-G.C.2a. Identify, describe and apply relationships between the angles and their intercepted arcs of a circle.</p> <p>GEO-G.C.2b. Identify, describe and apply relationships among radii, chords, tangents, and secants of a circle.</p> <p>GEO-G.C.5. Using proportionality, find one of the following given two others; the central angle, arc length, radius or area of sector.</p> <p>GEO-G.CO.12. Make, justify, and apply formal geometric constructions.</p> <p>GEO-G.CO.13. Make and justify the constructions for inscribing an equilateral triangle, a square and a regular hexagon in a circle.</p> <p>GEO-G.GPE.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</p> <p>GEO-G.GPE.7. Use coordinates to</p>				
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<p>compute perimeters of polygons and areas of triangles and rectangles. GEO-G.GMD.1. Provide informal arguments for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. GEO-G.GMD.3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. GEO-G.GMD.4. Identify the shapes of plane sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. GEO-G.MG.1. Use geometric shapes, their measures, and their properties to describe objects.</p>				
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