

South Carolina Tutorials are designed specifically for the South Carolina College and Career Readiness Standards and the South Carolina Academic Standards to prepare students for the South Carolina End-of-Course Examination Program (EOCEP), ACT Aspire, and the South Carolina Palmetto Assessment of State Standards (SCPASS).

Math Tutorials offer targeted instruction, practice and review designed to develop computational fluency, deepen conceptual understanding, and apply mathematical practices. They automatically identify and address learning gaps down to elementary-level content, using adaptive remediation to bring students to grade-level no matter where they start. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing the ability to apply their knowledge in abstract and real world scenarios, students build the depth of knowledge and higher order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible to students through focused content, modeled logic and process, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

Unit 1: Points, Lines, and Angles

• POINTS, RAYS, LINE SEGMENTS, LINES, AND FIGURES

- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GGPE.5: Expressing Geometric Properties with Equations Analyze slopes of lines to determine whether lines are parallel, perpendicular, or neither. Write the equation of a line passing through a given point that is parallel or perpendicular to a given line. Solve geometric and real-world problems involving lines and slope.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.

• PARALLEL AND PERPENDICULAR LINES

- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GGPE.5: Expressing Geometric Properties with Equations Analyze slopes of lines to determine whether lines are parallel, perpendicular, or neither. Write the equation of a line

passing through a given point that is parallel or perpendicular to a given line. Solve geometric and real-world problems involving lines and slope.

- **PARALLEL LINES AND ANGLE RELATIONSHIPS**

- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GCO.8.a: Congruence Prove, and apply in mathematical and real-world contexts, theorems about lines and angles, including the following: vertical angles are congruent;
- G.GCO.8.b: Congruence Prove, and apply in mathematical and real-world contexts, theorems about lines and angles, including the following: when a transversal crosses parallel lines, alternate interior angles are congruent, alternate exterior angles are congruent, and consecutive interior angles are supplementary;

- **PERPENDICULAR BISECTOR AND ANGLE BISECTOR THEOREMS**

- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GCO.8.d: Congruence Prove, and apply in mathematical and real-world contexts, theorems about lines and angles, including the following: perpendicular lines form four right angles.
- G.GCO.8.c: Congruence Prove, and apply in mathematical and real-world contexts, theorems about lines and angles, including the following: any point on a perpendicular bisector of a line segment is equidistant from the endpoints of the segment;

Unit 2: Coordinate Geometry

- **LENGTH AND THE DISTANCE FORMULA**

- G.GGPE.6: Expressing Geometric Properties with Equations Given two points, find the point on the line segment between the two points that divides the segment into a given ratio.
- G.GGPE.7: Expressing Geometric Properties with Equations Use the distance and midpoint formulas to determine distance and midpoint in a coordinate plane, as well as areas of triangles and rectangles, when given coordinates.
- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.

- **MIDPOINT FORMULA ON THE COORDINATE PLANE**

- G.GGPE.6: Expressing Geometric Properties with Equations Given two points, find the point on the line segment between the two points that divides the segment into a given ratio.

- G.GGPE.7: Expressing Geometric Properties with Equations Use the distance and midpoint formulas to determine distance and midpoint in a coordinate plane, as well as areas of triangles and rectangles, when given coordinates.
- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
- **CONJECTURES IN COORDINATE GEOMETRY**
 - G.GGPE.4: Expressing Geometric Properties with Equations Use coordinates to prove simple geometric theorems algebraically.
 - G.GCI.3: Circles Construct the inscribed and circumscribed circles of a triangle using a variety of tools, including a compass, a straightedge, and dynamic geometry software, and prove properties of angles for a quadrilateral inscribed in a circle.
- **CIRCLES**
 - G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
 - G.GGPE.1: Expressing Geometric Properties with Equations Understand that the standard equation of a circle is derived from the definition of a circle and the distance formula.

Unit 3: Perimeter, Area, and Transformations on the Coordinate Plane

- **PERIMETER ON THE COORDINATE PLANE**
 - G.GGPE.7: Expressing Geometric Properties with Equations Use the distance and midpoint formulas to determine distance and midpoint in a coordinate plane, as well as areas of triangles and rectangles, when given coordinates.
 - G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
 - G.GGPE.4: Expressing Geometric Properties with Equations Use coordinates to prove simple geometric theorems algebraically.
- **AREA ON THE COORDINATE PLANE**
 - G.GGPE.7: Expressing Geometric Properties with Equations Use the distance and midpoint formulas to determine distance and midpoint in a coordinate plane, as well as areas of triangles and rectangles, when given coordinates.
 - G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
- **TRANSFORMATIONS ON THE COORDINATE PLANE**

- G.GCO.2: Congruence Represent translations, reflections, rotations, and dilations of objects in the plane by using paper folding, sketches, coordinates, function notation, and dynamic geometry software, and use various representations to help understand the effects of simple transformations and their compositions.
- G.GCO.5: Congruence Predict and describe the results of transformations on a given figure using geometric terminology from the definitions of the transformations, and describe a sequence of transformations that maps a figure onto its image.
- G.GSRT.1: Similarity, Right Triangles, and Trigonometry Understand 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. Verify experimentally the properties of dilations given by a center and a scale factor. Understand the dilation of a line segment is longer or shorter in the ratio given by the scale factor.
- G.GSRT.2: Similarity, Right Triangles, and Trigonometry Use the definition of similarity to decide if figures are similar and justify decision. Demonstrate that two figures are similar by identifying a combination of translations, rotations, reflections, and dilations in various representations that move one figure onto the other.
- G.GCO.3: Congruence Describe rotations and reflections that carry a regular polygon onto itself and identify types of symmetry of polygons, including line, point, rotational, and self-congruence, and use symmetry to analyze mathematical situations.
- G.GCO.4: Congruence Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
- **DILATIONS, TRANSLATIONS, ROTATIONS, AND REFLECTIONS**
 - G.GCO.2: Congruence Represent translations, reflections, rotations, and dilations of objects in the plane by using paper folding, sketches, coordinates, function notation, and dynamic geometry software, and use various representations to help understand the effects of simple transformations and their compositions.
 - G.GCO.5: Congruence Predict and describe the results of transformations on a given figure using geometric terminology from the definitions of the transformations, and describe a sequence of transformations that maps a figure onto its image.
 - G.GSRT.1: Similarity, Right Triangles, and Trigonometry Understand 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. Verify experimentally the properties of dilations given by a center and a scale factor. Understand the dilation of a line segment is longer or shorter in the ratio given by the scale factor.
 - G.GSRT.2: Similarity, Right Triangles, and Trigonometry Use the definition of similarity to decide if figures are similar and justify decision. Demonstrate that two figures are similar by identifying a combination of translations, rotations, reflections, and dilations in various representations that move one figure onto the other.

- G.GCO.3: Congruence Describe rotations and reflections that carry a regular polygon onto itself and identify types of symmetry of polygons, including line, point, rotational, and self-congruence, and use symmetry to analyze mathematical situations.
- G.GCO.4: Congruence Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

Unit 4: Congruence and Similarity

• TRIANGLES AND CONGRUENCE TRANSFORMATIONS

- G.GCO.7: Congruence Prove two triangles are congruent by applying the Side-Angle-Side, Angle-Side-Angle, Angle-Angle-Side, and Hypotenuse-Leg congruence conditions.
- G.GSRT.5: Similarity, Right Triangles, and Trigonometry Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
- G.GCO.5: Congruence Predict and describe the results of transformations on a given figure using geometric terminology from the definitions of the transformations, and describe a sequence of transformations that maps a figure onto its image.
- G.GCO.6: Congruence Demonstrate that triangles and quadrilaterals are congruent by identifying a combination of translations, rotations, and reflections in various representations that move one figure onto the other.

• TRIANGLES AND SIMILARITY TRANSFORMATIONS

- G.GSRT.2: Similarity, Right Triangles, and Trigonometry Use the definition of similarity to decide if figures are similar and justify decision. Demonstrate that two figures are similar by identifying a combination of translations, rotations, reflections, and dilations in various representations that move one figure onto the other.
- G.GSRT.4.a: Similarity, Right Triangles, and Trigonometry Prove, and apply in mathematical and real-world contexts, theorems involving similarity about triangles, including the following: A line drawn parallel to one side of a triangle divides the other two sides into parts of equal proportion.
- G.GSRT.4.b: Similarity, Right Triangles, and Trigonometry Prove, and apply in mathematical and real-world contexts, theorems involving similarity about triangles, including the following: If a line divides two sides of a triangle proportionally, then it is parallel to the third side.
- G.GSRT.5: Similarity, Right Triangles, and Trigonometry Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
- G.GSRT.3: Similarity, Right Triangles, and Trigonometry Prove that two triangles are similar using the Angle-Angle criterion and apply the proportionality of corresponding sides to solve problems and justify results.

• CONGRUENCE OF OTHER POLYGONS

- G.GCO.3: Congruence Describe rotations and reflections that carry a regular polygon onto itself and identify types of symmetry of polygons, including line, point, rotational, and self-congruence, and use symmetry to analyze mathematical situations.

- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
 - G.GCO.2: Congruence Represent translations, reflections, rotations, and dilations of objects in the plane by using paper folding, sketches, coordinates, function notation, and dynamic geometry software, and use various representations to help understand the effects of simple transformations and their compositions.
 - G.GCO.6: Congruence Demonstrate that triangles and quadrilaterals are congruent by identifying a combination of translations, rotations, and reflections in various representations that move one figure onto the other.
 - G.GCO.5: Congruence Predict and describe the results of transformations on a given figure using geometric terminology from the definitions of the transformations, and describe a sequence of transformations that maps a figure onto its image.
- **SIMILARITY OF OTHER POLYGONS**
 - G.GSRT.2: Similarity, Right Triangles, and Trigonometry Use the definition of similarity to decide if figures are similar and justify decision. Demonstrate that two figures are similar by identifying a combination of translations, rotations, reflections, and dilations in various representations that move one figure onto the other.

Unit 5: Triangles

- **TRIANGLE ANGLE THEOREMS**
 - G.GCO.9.a: Congruence Prove, and apply in mathematical and real-world contexts, theorems about the relationships within and among triangles, including the following: measures of interior angles of a triangle sum to 180;
 - G.GCO.9.b: Congruence Prove, and apply in mathematical and real-world contexts, theorems about the relationships within and among triangles, including the following: base angles of isosceles triangles are congruent;
- **TRIANGLE BISECTORS**
 - G.GCO.8.c: Congruence Prove, and apply in mathematical and real-world contexts, theorems about lines and angles, including the following: any point on a perpendicular bisector of a line segment is equidistant from the endpoints of the segment;
 - G.GCO.9.c: Congruence Prove, and apply in mathematical and real-world contexts, theorems about the relationships within and among triangles, including the following: the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length;
 - G.GSRT.5: Similarity, Right Triangles, and Trigonometry Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
 - G.GCI.3: Circles Construct the inscribed and circumscribed circles of a triangle using a variety of tools, including a compass, a straightedge, and dynamic geometry software, and prove properties of angles for a quadrilateral inscribed in a circle.

- G.GCO.11: Congruence Construct geometric figures using a variety of tools, including a compass, a straightedge, dynamic geometry software, and paper folding, and use these constructions to make conjectures about geometric relationships.

- **MEDIANS AND ALTITUDES OF TRIANGLES**

- G.GCO.9.d: Congruence Prove, and apply in mathematical and real-world contexts, theorems about the relationships within and among triangles, including the following: the medians of a triangle meet at a point.

Unit 6: Quadrilaterals and Constructions

- **PARALLELOGRAMS AND RECTANGLES**

- G.GCO.10.a: Congruence Prove, and apply in mathematical and real-world contexts, theorems about parallelograms, including the following: opposite sides of a parallelogram are congruent;
- G.GCO.10.b: Congruence Prove, and apply in mathematical and real-world contexts, theorems about parallelograms, including the following: opposite angles of a parallelogram are congruent;
- G.GCO.10.c: Congruence Prove, and apply in mathematical and real-world contexts, theorems about parallelograms, including the following: diagonals of a parallelogram bisect each other;
- G.GCO.10.d: Congruence Prove, and apply in mathematical and real-world contexts, theorems about parallelograms, including the following: rectangles are parallelograms with congruent diagonals;
- G.GCO.10.e: Congruence Prove, and apply in mathematical and real-world contexts, theorems about parallelograms, including the following: a parallelogram is a rhombus if and only if the diagonals are perpendicular
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.

- **SQUARES AND RHOMBI**

- G.GCO.10.a: Congruence Prove, and apply in mathematical and real-world contexts, theorems about parallelograms, including the following: opposite sides of a parallelogram are congruent;
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
- G.GCO.10.e: Congruence Prove, and apply in mathematical and real-world contexts, theorems about parallelograms, including the following: a parallelogram is a rhombus if and only if the diagonals are perpendicular

- **CONSTRUCTIONS**

- G.GCI.4: Circles Construct a tangent line to a circle through a point on the circle, and construct a tangent line from a point outside a given circle to the circle; justify the process used for each construction.

- G.GCO.11: Congruence Construct geometric figures using a variety of tools, including a compass, a straightedge, dynamic geometry software, and paper folding, and use these constructions to make conjectures about geometric relationships.

Unit 7: Triangles and Trigonometry

• THE PYTHAGOREAN THEOREM

- G.GSRT.4.c: Similarity, Right Triangles, and Trigonometry Prove, and apply in mathematical and real-world contexts, theorems involving similarity about triangles, including the following: The square of the hypotenuse of a right triangle is equal to the sum of squares of the other two sides.
- G.GSRT.8: Similarity, Right Triangles, and Trigonometry Solve right triangles in applied problems using trigonometric ratios and the Pythagorean Theorem.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
- G.GSRT.4.a: Similarity, Right Triangles, and Trigonometry Prove, and apply in mathematical and real-world contexts, theorems involving similarity about triangles, including the following: A line drawn parallel to one side of a triangle divides the other two sides into parts of equal proportion.
- G.GSRT.4.b: Similarity, Right Triangles, and Trigonometry Prove, and apply in mathematical and real-world contexts, theorems involving similarity about triangles, including the following: If a line divides two sides of a triangle proportionally, then it is parallel to the third side.
- G.GSRT.5: Similarity, Right Triangles, and Trigonometry Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

• TRIGONOMETRIC RATIOS

- G.GSRT.6: Similarity, Right Triangles, and Trigonometry Understand how the properties of similar right triangles allow the trigonometric ratios to be defined and determine the sine, cosine, and tangent of an acute angle in a right triangle.
- G.GSRT.7: Similarity, Right Triangles, and Trigonometry Explain and use the relationship between the sine and cosine of complementary angles.
- G.GSRT.8: Similarity, Right Triangles, and Trigonometry Solve right triangles in applied problems using trigonometric ratios and the Pythagorean Theorem.
- G.GSRT.5: Similarity, Right Triangles, and Trigonometry Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.

- **RADIANS AND THE UNIT CIRCLE**

- G.GCI.5: Circles Derive the formulas for the length of an arc and the area of a sector in a circle and apply these formulas to solve mathematical and real-world problems.
- G.GSRT.8: Similarity, Right Triangles, and Trigonometry Solve right triangles in applied problems using trigonometric ratios and the Pythagorean Theorem.

Unit 8: Circles and Circle Parts

- **CIRCLE BASICS**

- G.GCI.2: Circles Identify and describe relationships among inscribed angles, radii, and chords; among inscribed angles, central angles, and circumscribed angles; and between radii and tangents to circles. Use those relationships to solve mathematical and real-world problems.
- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GCO.8.c: Congruence Prove, and apply in mathematical and real-world contexts, theorems about lines and angles, including the following: any point on a perpendicular bisector of a line segment is equidistant from the endpoints of the segment;

- **CENTRAL ANGLES, INSCRIBED ANGLES, AND CHORDS**

- G.GCI.2: Circles Identify and describe relationships among inscribed angles, radii, and chords; among inscribed angles, central angles, and circumscribed angles; and between radii and tangents to circles. Use those relationships to solve mathematical and real-world problems.
- G.GCI.3: Circles Construct the inscribed and circumscribed circles of a triangle using a variety of tools, including a compass, a straightedge, and dynamic geometry software, and prove properties of angles for a quadrilateral inscribed in a circle.
- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.

- **SECANTS, ANGLES, AND INTERCEPTED ARCS**

- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GCI.2: Circles Identify and describe relationships among inscribed angles, radii, and chords; among inscribed angles, central angles, and circumscribed angles; and between radii and tangents to circles. Use those relationships to solve mathematical and real-world problems.

- **TANGENTS, ANGLES, AND INTERCEPTED ARCS**

- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.

- G.GCI.2: Circles Identify and describe relationships among inscribed angles, radii, and chords; among inscribed angles, central angles, and circumscribed angles; and between radii and tangents to circles. Use those relationships to solve mathematical and real-world problems.

Unit 9: Properties of Circles

• CONGRUENT AND SIMILAR CIRCLES

- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GCI.1: Circles Prove that all circles are similar.
- G.GSRT.2: Similarity, Right Triangles, and Trigonometry Use the definition of similarity to decide if figures are similar and justify decision. Demonstrate that two figures are similar by identifying a combination of translations, rotations, reflections, and dilations in various representations that move one figure onto the other.
- G.GCO.4: Congruence Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

• CIRCUMFERENCE AND ARC LENGTH

- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GGMD.1: Geometric Measurement and Dimension Explain the derivations of the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone. Apply these formulas to solve mathematical and real-world problems.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.

• AREA OF CIRCLES AND SECTORS

- G.GCO.1: Congruence Define angle, perpendicular line, parallel line, line segment, ray, circle, and skew in terms of the undefined notions of point, line, and plane. Use geometric figures to represent and describe real-world objects.
- G.GGMD.1: Geometric Measurement and Dimension Explain the derivations of the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone. Apply these formulas to solve mathematical and real-world problems.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
- G.GCI.5: Circles Derive the formulas for the length of an arc and the area of a sector in a circle and apply these formulas to solve mathematical and real-world problems.

Unit 10: Surface Area

• SURFACE AREA AND VOLUME OF SPHERES

- G.GGMD.2: Geometric Measurement and Dimension Explain the derivation of the formulas for the volume of a sphere and other solid figures using Cavalieris principle.
- G.GGMD.3: Geometric Measurement and Dimension Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems and justify results. Include problems that involve algebraic expressions, composite figures, geometric probability, and real-world applications.
- G.GGMD.4: Geometric Measurement and Dimension Describe the shapes of two-dimensional cross-sections of three-dimensional objects and use those cross-sections to solve mathematical and real-world problems.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
- **SURFACE AREA OF COMPOSITE SOLIDS**
 - G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
 - G.GGMD.3: Geometric Measurement and Dimension Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems and justify results. Include problems that involve algebraic expressions, composite figures, geometric probability, and real-world applications.
- **SURFACE AREA OF SIMILAR SOLIDS**
 - G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
 - G.GGMD.3: Geometric Measurement and Dimension Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems and justify results. Include problems that involve algebraic expressions, composite figures, geometric probability, and real-world applications.

Unit 11: Volume

- **RELATING TWO-DIMENSIONAL FIGURES TO THREE-DIMENSIONAL SOLIDS**
 - G.GGMD.4: Geometric Measurement and Dimension Describe the shapes of two-dimensional cross-sections of three-dimensional objects and use those cross-sections to solve mathematical and real-world problems.
- **VOLUME OF PRISMS AND PYRAMIDS**
 - G.GGMD.1: Geometric Measurement and Dimension Explain the derivations of the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone. Apply these formulas to solve mathematical and real-world problems.
 - G.GGMD.3: Geometric Measurement and Dimension Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems and justify results. Include problems that involve algebraic expressions, composite figures, geometric probability, and real-world applications.

- G.GGMD.4: Geometric Measurement and Dimension Describe the shapes of two-dimensional cross-sections of three-dimensional objects and use those cross-sections to solve mathematical and real-world problems.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
- G.GGMD.2: Geometric Measurement and Dimension Explain the derivation of the formulas for the volume of a sphere and other solid figures using Cavalieris principle.

- **VOLUME OF CYLINDERS AND CONES**

- G.GGMD.1: Geometric Measurement and Dimension Explain the derivations of the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone. Apply these formulas to solve mathematical and real-world problems.
- G.GGMD.3: Geometric Measurement and Dimension Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems and justify results. Include problems that involve algebraic expressions, composite figures, geometric probability, and real-world applications.
- G.GGMD.4: Geometric Measurement and Dimension Describe the shapes of two-dimensional cross-sections of three-dimensional objects and use those cross-sections to solve mathematical and real-world problems.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.

- **MODELING SITUATIONS WITH GEOMETRY**

- G.GM.2: Modeling Use geometry concepts and methods to model real-world situations and solve problems using a model.
- G.GGMD.3: Geometric Measurement and Dimension Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems and justify results. Include problems that involve algebraic expressions, composite figures, geometric probability, and real-world applications.

Unit 12: Volume of Similar and Composite Shapes

- **VOLUME OF COMPOSITE SOLIDS**

- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.
- G.GGMD.3: Geometric Measurement and Dimension Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems and justify results. Include problems that involve algebraic expressions, composite figures, geometric probability, and real-world applications.

- **VOLUME OF SIMILAR SOLIDS**

- G.GGMD.1: Geometric Measurement and Dimension Explain the derivations of the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone. Apply these formulas to solve mathematical and real-world problems.
- G.GGMD.3: Geometric Measurement and Dimension Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems and justify results. Include problems that involve algebraic expressions, composite figures, geometric probability, and real-world applications.
- G.GM.1: Modeling Use geometric shapes, their measures, and their properties to describe real-world objects.

Unit 13: Statistics

- **DATA ANALYSIS**

- G.SPID.1: Interpreting Data Select and create an appropriate display, including dot plots, histograms, and box plots, for data that includes only real numbers.
- G.SPID.3: Interpreting Data Summarize and represent data from a single data set. Interpret differences in shape, center, and spread in the context of the data set, accounting for possible effects of extreme data points (outliers).
- G.SPID.2: Interpreting Data Use statistics appropriate to the shape of the data distribution to compare center and spread of two or more different data sets that include all real numbers.