

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: Exponents, Square Roots, and Slope

- **LAWS OF EXPONENTS**

- GS.NR.1.1: Rewrite numerical expressions of irrational and rational numbers involving radicals, including addition, subtraction, multiplication, and division, to recognize geometric patterns.

- **SIMPLIFYING SQUARE ROOTS**

- GS.NR.1.1: Rewrite numerical expressions of irrational and rational numbers involving radicals, including addition, subtraction, multiplication, and division, to recognize geometric patterns.

- **SLOPE-INTERCEPT FORM OF A LINEAR EQUATION**

- GS.PAFR.2.3: Determine the equation of a line passing through a given point that is parallel or perpendicular to a given line.

- **POINT-SLOPE FORM OF A LINEAR EQUATION**

- GS.PAFR.2.3: Determine the equation of a line passing through a given point that is parallel or perpendicular to a given line.

Unit 2: Lines and Angles

- **PARALLEL AND PERPENDICULAR LINES**

- GS.PAFR.2.2: Analyze slopes of lines to determine whether lines are parallel, perpendicular, or neither.

- **PARALLEL LINES AND ANGLE RELATIONSHIPS**

- GS.MGSR.5.1: Justify and apply the attributes of angle relationships/lines in mathematical and real-world situations.

- **PERPENDICULAR BISECTOR AND ANGLE BISECTOR THEOREMS**

- GS.MGSR.5.1: Justify and apply the attributes of angle relationships/lines in mathematical and real-world situations.

Unit 3: Coordinate Geometry

- **LENGTH AND THE DISTANCE FORMULA**

- GS.PAFR.3.2: Determine distance and midpoint of segments in a coordinate plane to find areas of triangles and quadrilaterals, when given coordinates.

- **MIDPOINT FORMULA ON THE COORDINATE PLANE**

- GS.PAFR.3.2: Determine distance and midpoint of segments in a coordinate plane to find areas of triangles and quadrilaterals, when given coordinates.

- **CONJECTURES IN COORDINATE GEOMETRY**

- GS.PAFR.3.1: Use coordinates to prove simple geometric theorems algebraically.

Unit 4: Transformations on the Coordinate Plane

- **TRANSFORMATIONS ON THE COORDINATE PLANE**

- GS.MGSR.2.1: Describe the results of transformations on a given figure using geometric terminology from the definitions of the transformations.
- GS.MGSR.2.2: Describe and apply a sequence of transformations that maps a preimage onto its image.
- GS.MGSR.4.2: Justify experimentally that a dilation of a line segment is longer or shorter, given the ratio.

- **DILATIONS, TRANSLATIONS, ROTATIONS, AND REFLECTIONS**

- GS.MGSR.2.1: Describe the results of transformations on a given figure using geometric terminology from the definitions of the transformations.
- GS.MGSR.2.2: Describe and apply a sequence of transformations that maps a preimage onto its image.
- GS.MGSR.4.1: Demonstrate experimentally the properties of dilations given by a center and a scale factor.
- GS.MGSR.4.2: Justify experimentally that a dilation of a line segment is longer or shorter, given the ratio.

Unit 5: Congruence and Similarity

- **TRIANGLES AND CONGRUENCE TRANSFORMATIONS**

- GS.MGSR.2.1: Describe the results of transformations on a given figure using geometric terminology from the definitions of the transformations.
- GS.MGSR.3.2: Demonstrate that triangles and quadrilaterals are congruent by a combination of translations, rotations, and reflections.
- GS.MGSR.3.3: Recognize the criteria for showing triangles are congruent using a sequence of rigid motions that map one triangle to another and justify that the two triangles are congruent by applying the Side-Side-Side, Side-Angle-Side, Angle-Side-Angle, Angle-Angle-Side, and Hypotenuse-Leg congruence conditions.

- **TRIANGLES AND SIMILARITY TRANSFORMATIONS**

- GS.MGSR.4.3: Recognize that the criteria for showing triangles are similar using a similarity transformation that maps one figure to the other and justify the two triangles are similar by applying the Angle-Angle, Side-Side-Side, and Side-Angle-Side similarity conditions.
- GS.MGSR.5.2: Apply the attributes of triangles in mathematical and real-world situations.

- **CONGRUENCE OF OTHER POLYGONS**

- GS.MGSR.2.2: Describe and apply a sequence of transformations that maps a preimage onto its image.
- GS.MGSR.3.1: Identify types of symmetry of polygons, including line, point, rotational, and self-congruence, and use symmetry to analyze mathematical situations.
- GS.MGSR.3.2: Demonstrate that triangles and quadrilaterals are congruent by a combination of translations, rotations, and reflections.

Unit 6: Triangles

- **TRIANGLE ANGLE THEOREMS**

- GS.MGSR.5.2: Apply the attributes of triangles in mathematical and real-world situations.

- **TRIANGLE BISECTORS**

- GS.MGSR.5.2: Apply the attributes of triangles in mathematical and real-world situations.

- **MEDIANS AND ALTITUDES OF TRIANGLES**

- GS.MGSR.5.2: Apply the attributes of triangles in mathematical and real-world situations.

Unit 7: Quadrilaterals

- **PARALLELOGRAMS AND RECTANGLES**

- GS.MGSR.5.3: Apply the attributes of quadrilaterals, including diagonals, sides, and angles, to prove that a given quadrilateral is a parallelogram in mathematical and real-world situations.

- **SQUARES AND RHOMBI**

- GS.MGSR.5.3: Apply the attributes of quadrilaterals, including diagonals, sides, and angles, to prove that a given quadrilateral is a parallelogram in mathematical and real-world situations.

Unit 8: Triangles and Trigonometry

- **PYTHAGOREAN THEOREM**

- GS.MGSR.6.1: Discover and apply the converse of the Pythagorean Theorem.

- **SPECIAL RIGHT TRIANGLES**

- GS.MGSR.6.2: Discover and apply the constant ratios of the sides in 30-60-90 and 45-45-90 right triangles.

- **TRIGONOMETRIC RATIOS**

- GS.MGSR.6.3: Define the trigonometric ratios using the properties of similar right triangles.
- GS.MGSR.6.4: Determine the sine, cosine, and tangent of an acute angle in a right triangle in the context of mathematical and real-world situations.
- GS.MGSR.6.5: Apply trigonometric ratios (sine, cosine, tangent) and the Pythagorean Theorem to solve right triangle problems in real-life situations.

Unit 9: Circles and Circle Parts

- **CIRCLE BASICS**

- GS.MGSR.7.1: Use angle and segment relationships in circles to solve mathematical and real-world situations.
- GS.MGSR.7.2: Investigate and apply relationships in circles, inscribed angles, radii, secants, and chords; among inscribed angles, central angles, and circumscribed angles; and between radii and tangents to circles.

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

- GS.MGSR.7.1: Use angle and segment relationships in circles to solve mathematical and real-world situations.
- GS.MGSR.7.2: Investigate and apply relationships in circles, inscribed angles, radii, secants, and chords; among inscribed angles, central angles, and circumscribed angles; and between radii and tangents to circles.

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

- GS.MGSR.7.1: Use angle and segment relationships in circles to solve mathematical and real-world situations.
- GS.MGSR.7.2: Investigate and apply relationships in circles, inscribed angles, radii, secants, and chords; among inscribed angles, central angles, and circumscribed angles; and between radii and tangents to circles.

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

- GS.MGSR.7.1: Use angle and segment relationships in circles to solve mathematical and real-world situations.

- GS.MGSR.7.2: Investigate and apply relationships in circles, inscribed angles, radii, secants, and chords; among inscribed angles, central angles, and circumscribed angles; and between radii and tangents to circles.

Unit 10: Properties of Circles

• CIRCUMFERENCE AND ARC LENGTH

- GS.PAFR.1.1: Discover and apply the formulas for the length of an arc and the area of a sector in a circle to develop mathematical models and solve mathematical and real-world situations.
- GS.PAFR.1.2: Analyze and apply the derivations of the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone to model real phenomena and solve mathematical and real-world situations.

• AREA OF CIRCLES AND SECTORS

- GS.PAFR.1.1: Discover and apply the formulas for the length of an arc and the area of a sector in a circle to develop mathematical models and solve mathematical and real-world situations.
- GS.PAFR.1.2: Analyze and apply the derivations of the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone to model real phenomena and solve mathematical and real-world situations.

Unit 11: Surface Area

• SURFACE AREA AND VOLUME OF SPHERES

- GS.PAFR.2.1: Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, spheres, and/or compositions of figures to solve problems and justify results.

• SURFACE AREA OF COMPOSITE SOLIDS

- GS.MGSR.1.1: Apply area and volume formulas of two- and three-dimensional figures to solve real-world situations.
- GS.PAFR.2.1: Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, spheres, and/or compositions of figures to solve problems and justify results.

Unit 12: Volume

• VOLUME OF PRISMS, CUBES, AND PYRAMIDS

- GS.MGSR.1.2: Identify the shape of a two-dimensional cross-section of a three-dimensional figure.
- GS.MGSR.1.3: Use cross-sections of three-dimensional figures to model and solve mathematical and real-world situations.

• VOLUME OF PRISMS, CUBES, AND PYRAMIDS

- GS.MGSR.1.1: Apply area and volume formulas of two- and three-dimensional figures to solve real-world situations.
- GS.PAFR.1.2: Analyze and apply the derivations of the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone to model real phenomena and solve mathematical and real-world situations.

- GS.PAFR.2.1: Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, spheres, and/or compositions of figures to solve problems and justify results.
- **VOLUME OF CYLINDERS AND CONES**
 - GS.MGSR.1.1: Apply area and volume formulas of two- and three-dimensional figures to solve real-world situations.
 - GS.PAFR.1.2: Analyze and apply the derivations of the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone to model real phenomena and solve mathematical and real-world situations.
 - GS.PAFR.2.1: Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, spheres, and/or compositions of figures to solve problems and justify results.
- **VOLUME OF COMPOSITE SOLIDS**
 - GS.MGSR.1.1: Apply area and volume formulas of two- and three-dimensional figures to solve real-world situations.
 - GS.PAFR.2.1: Apply surface area and volume formulas for prisms, cylinders, pyramids, cones, spheres, and/or compositions of figures to solve problems and justify results.

Unit 13: Statistics and Probability

- **SCATTERPLOTS**
 - GS.DPSR.1.1: Represent data for two quantitative variables on a scatter plot and describe how the variables are related.
 - GS.DPSR.1.2: Use two representative points from the data to find an approximate line of fit and compare it to the line of best fit.
 - GS.DPSR.2.1: Distinguish between correlation and causation.
- **INTRODUCTION TO PROBABILITY**
 - GS.DPSR.3.1: Describe categories of events as subsets of a sample space using unions, intersections, or complements of other events.
 - GS.DPSR.3.2: Apply the Addition Rule to find the probability of both mutually exclusive and not mutually exclusive events and interpret the answers in context.
 - GS.DPSR.3.3: Apply the Multiplication Rule to determine the probability of independent events and interpret the answers in context.