

SOL EOC Tutorials for Virginia are designed specifically for the Virginia Standards of Learning to prepare students for the Standards of Learning tests.

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.

Test-Taking Strategies for EOC Tutorials allow students to practice and apply learning approaches that will hone their test-taking skills and focus them for success on the day of their EOC test.

Unit 1: Logic

- **CONDITIONAL STATEMENTS AND SYLLOGISMS**

- G.RLT.1.a: Translate propositional statements and compound statements into symbolic form, including negations (p , read not p), conjunctions ($p \wedge q$, read p and q), disjunctions ($p \vee q$, read p or q), conditionals ($p \rightarrow q$, read if p then q), and biconditionals ($p \leftrightarrow q$, read p if and only if q), including statements representing geometric relationships.
- G.RLT.1.b: Identify and determine the validity of the converse, inverse, and contrapositive of a conditional statement, and recognize the connection between a biconditional statement and a true conditional statement with a true converse, including statements representing geometric relationships.
- G.RLT.1.d: Interpret Venn diagrams, including those representing contextual situations.

- **CONVERSE, INVERSE, AND CONTRAPOSITIVE STATEMENTS**

- G.RLT.1.b: Identify and determine the validity of the converse, inverse, and contrapositive of a conditional statement, and recognize the connection between a biconditional statement and a true conditional statement with a true converse, including statements representing geometric relationships.

Unit 2: Transformations

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

- G.RLT.3.c.i: translations;
- G.RLT.3.c.ii: reflections over any horizontal or vertical line or the lines $y = x$ or $y = -x$;
- G.RLT.3.c.iii: clockwise or counterclockwise rotations of 90, 180, 270, or 360 on a coordinate grid where the center of rotation is limited to the origin; and
- G.RLT.3.c.iv: dilations, from a fixed point on a coordinate grid.

Unit 3: Congruence

- **TRIANGLE CONGRUENCE**

- G.TR.2.a: Use definitions, postulates, and theorems (including Side-Side-Side (SSS); Side-Angle-Side (SAS); Angle-Side-Angle (ASA); Angle-Angle-Side (AAS); and Hypotenuse-Leg (HL)) to prove and justify two triangles are congruent.

Unit 4: Similarity Transformations

- **TRIANGLES AND SIMILARITY TRANSFORMATIONS**

- G.TR.3.d: Describe a sequence of transformations that can be used to verify similarity of triangles located in the same plane.
- G.TR.3.e: Solve problems, including those in context involving attributes of similar triangles.
- G.DF.2.e: Recognize when two- and three-dimensional figures are similar and solve problems, including those in context, involving attributes of similar geometric figures.

Unit 5: Triangle Similarity

- **TRIANGLE SIMILARITY**

- G.TR.3.a: Use definitions, postulates, and theorems (including Side-Angle-Side (SAS); Side-Side-Side (SSS); and Angle-Angle (AA)) to prove and justify that triangles are similar.

Unit 6: Polygon Similarity

- **SIMILARITY OF OTHER POLYGONS**

- G.DF.2.e: Recognize when two- and three-dimensional figures are similar and solve problems, including those in context, involving attributes of similar geometric figures.

Unit 7: Triangles

- **CLASSIFYING TRIANGLES**

- G.TR.1.a: Given the lengths of three segments, determine whether a triangle could be formed.

- G.TR.1.b: Given the lengths of two sides of a triangle, determine the range in which the length of the third side must lie.
- G.TR.1.c: Order the sides of a triangle by their lengths when given information about the measures of the angles.
- G.TR.1.e: Solve for interior and exterior angles of a triangle, when given two angles.
- **TRIANGLE ANGLE THEOREMS**
 - G.TR.1.e: Solve for interior and exterior angles of a triangle, when given two angles.
- **PYTHAGOREAN THEOREM**
 - G.TR.4.a: Determine whether a triangle formed with three given lengths is a right triangle.
 - G.TR.4.g: Solve problems, including those in context, involving right triangles using the Pythagorean Theorem and its converse, including recognizing Pythagorean Triples.
- **PYTHAGOREAN TRIPLES**
 - G.TR.4.a: Determine whether a triangle formed with three given lengths is a right triangle.

Unit 8: Triangles and Trigonometry

- **TRIGONOMETRIC RATIOS**
 - G.TR.4.b: Find and verify trigonometric ratios using right triangles.
 - G.TR.4.c: Model and solve problems, including those in context, involving right triangle trigonometry (sine, cosine, and tangent ratios).
- **PROBLEM SOLVING WITH RIGHT TRIANGLES**
 - G.TR.4.c: Model and solve problems, including those in context, involving right triangle trigonometry (sine, cosine, and tangent ratios).
- **SPECIAL RIGHT TRIANGLES**
 - G.TR.4.d: Solve problems using the properties of special right triangles.
 - G.TR.4.e: Solve for missing lengths in geometric figures, using properties of 45-45-90 triangles, where rationalizing denominators may be necessary.
 - G.TR.4.f: Solve for missing lengths in geometric figures, using properties of 30-60-90 triangles, where rationalizing denominators may be necessary.

Unit 9: Properties of Polygons

- **POLYGON BASICS**
 - G.PC.2.a: Solve problems involving the number of sides of a regular polygon given the measures of the interior and exterior angles of the polygon.
 - G.PC.2.b: Justify the relationship between the sum of the measures of the interior and exterior angles of a convex polygon and solve problems involving the sum of the measures of the angles.

- G.PC.2.c: Justify the relationship between the measure of each interior and exterior angle of a regular polygon and solve problems involving the measures of the angles.
- **PERIMETER ON THE COORDINATE PLANE**
- G.PC.1.b: Prove and justify that quadrilaterals have specific properties, using coordinate and algebraic methods, such as the slope formula, the distance formula, and the midpoint formula.

Unit 10: Parallel Lines and Relationships

- **PARALLEL LINES AND ANGLE RELATIONSHIPS**
- G.RLT.2.a.i: corresponding angles;
- G.RLT.2.a.ii: alternate interior angles;
- G.RLT.2.a.iii: alternate exterior angles;
- G.RLT.2.a.iv: same-side (consecutive) interior angles; and
- G.RLT.2.a.v: same-side (consecutive) exterior angles.
- G.RLT.2.b: Prove two or more lines are parallel given angle measurements expressed numerically or algebraically.
- G.RLT.2.c: Solve problems by using the relationships between pairs of angles formed by the intersection of two parallel lines and a transversal.

Unit 11: Parallel Lines and Quadrilaterals

- **PARALLELOGRAMS AND RECTANGLES**
- G.PC.1.a: Solve problems, using the properties specific to parallelograms, rectangles, rhombi, squares, isosceles trapezoids, and trapezoids.
- G.PC.1.c: Prove and justify theorems and properties of quadrilaterals using deductive reasoning.
- **SQUARES AND RHOMBI**
- G.PC.1.a: Solve problems, using the properties specific to parallelograms, rectangles, rhombi, squares, isosceles trapezoids, and trapezoids.
- G.PC.1.c: Prove and justify theorems and properties of quadrilaterals using deductive reasoning.
- **TRAPEZOIDS**
- G.PC.1.a: Solve problems, using the properties specific to parallelograms, rectangles, rhombi, squares, isosceles trapezoids, and trapezoids.
- G.PC.1.c: Prove and justify theorems and properties of quadrilaterals using deductive reasoning.

Unit 12: Circles

- **CIRCLES**
- G.PC.4.a: Derive the equation of a circle of given the center and radius using the Pythagorean Theorem.

- G.PC.4.b.i: given a graph or the equation of a circle in standard form, identify the coordinates of the center of the circle;
- G.PC.4.c.iii: coordinates of the center and the length of the radius or diameter; and
- **CENTRAL ANGLES, INSCRIBED ANGLES, AND CHORDS**
 - G.PC.3.b: Solve for arc measures and angles in a circle formed by central angles.
 - G.PC.3.c: Solve for arc measures and angles in a circle involving inscribed angles.
- **CIRCUMFERENCE AND ARC LENGTH**
 - G.PC.3.d: Calculate the length of an arc of a circle.
- **AREA OF CIRCLES AND SECTORS**
 - G.PC.3.a: Determine the proportional relationship between the arc length or area of a sector and other parts of a circle.
 - G.PC.3.e: Calculate the area of a sector of a circle.
 - G.PC.3.f: Apply arc length or sector area to solve for an unknown measurement of the circle including the radius, diameter, arc measure, central angle, arc length, or sector area.

Unit 13: Prisms and Pyramids

- **RELATING TWO-DIMENSIONAL FIGURES TO THREE-DIMENSIONAL SOLIDS**
 - G.DF.1.a: Identify the shape of a two-dimensional cross section of a three-dimensional figure.
- **SURFACE AREA OF PRISMS AND PYRAMIDS**
 - G.DF.1.b: Create models and solve problems, including those in context, involving surface area of three-dimensional figures, as well as composite three-dimensional figures.
- **VOLUME OF PRISMS, CUBES, AND PYRAMIDS**
 - G.DF.1.c: Solve multistep problems, including those in context, involving volume of three-dimensional figures, as well as composite three-dimensional figures.

Unit 14: Spheres, Cylinders, and Cones

- **SURFACE AREA AND VOLUME OF SPHERES**
 - G.DF.1.b: Create models and solve problems, including those in context, involving surface area of three-dimensional figures, as well as composite three-dimensional figures.
 - G.DF.1.c: Solve multistep problems, including those in context, involving volume of three-dimensional figures, as well as composite three-dimensional figures.
 - G.DF.1.d: Determine unknown measurements of three-dimensional figures using information such as length of a side, area of a face, or volume.
- **SURFACE AREA OF CYLINDERS AND CONES**
 - G.DF.1.b: Create models and solve problems, including those in context, involving surface area of three-dimensional figures, as well as composite three-dimensional figures.

- **VOLUME OF CYLINDERS AND CONES**

- G.DF.1.c: Solve multistep problems, including those in context, involving volume of three-dimensional figures, as well as composite three-dimensional figures.

Unit 15: Composite Solids

- **SURFACE AREA OF COMPOSITE SOLIDS**

- G.DF.1.b: Create models and solve problems, including those in context, involving surface area of three-dimensional figures, as well as composite three-dimensional figures.

- **VOLUME OF COMPOSITE SOLIDS**

- G.DF.1.c: Solve multistep problems, including those in context, involving volume of three-dimensional figures, as well as composite three-dimensional figures.

Unit 16: Changing Dimension and Similar Solids

- **SURFACE AREA OF SIMILAR SOLIDS**

- G.DF.2.d: Compare ratios between side lengths, perimeters, areas, and volumes of similar figures.

- **VOLUME OF SIMILAR SOLIDS**

- G.DF.2.d: Compare ratios between side lengths, perimeters, areas, and volumes of similar figures.

- **EFFECTS OF CHANGING DIMENSIONS ON PERIMETER, AREA, AND VOLUME**

- G.DF.2.a: Describe how changes in one or more dimensions of a figure affect other derived measures (perimeter, area, total surface area, and volume) of the figure.
- G.DF.2.c: Solve problems, including those in context, involving changing the dimensions or derived measures of a three-dimensional figure.

Unit 17: Test-Taking Strategies

- **STUDY HABITS**

- **BEING PREPARED AND GETTING STARTED**

- **WORDING IN TEST QUESTIONS**

- **WORDING IN ANSWER CHOICES**

- **QUESTIONS WITH PASSAGES AND VISUAL DATA**

- **ESSAY AND SHORT ANSWER QUESTIONS**

- **WORD PROBLEMS**