

Tutorials 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.

1. LOGIC AND CONSTRUCTIONS

- **CONDITIONAL STATEMENTS AND SYLLOGISMS**

- **RLT.G.1.c** *determining the validity of a logical argument.*
- **RLT.G.1.b** *translating a short verbal argument into symbolic form; and*

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

- **RLT.G.1.a** *identifying the converse, inverse, and contrapositive of a conditional statement;*
- **RLT.G.1.c** *determining the validity of a logical argument.*

- **CONSTRUCTIONS**

- **RLT.G.3.c** *investigating symmetry and determining whether a figure is symmetric with respect to a line or a point; and*
- **RLT.G.4.a** *a line segment congruent to a given line segment;*
- **RLT.G.4.b** *the perpendicular bisector of a line segment;*
- **RLT.G.4.c** *a perpendicular to a given line from a point not on the line;*
- **RLT.G.4.d** *a perpendicular to a given line at a given point on the line;*
- **RLT.G.4.e** *the bisector of a given angle,*
- **RLT.G.4.f** *an angle congruent to a given angle;*
- **RLT.G.4.h** *an equilateral triangle, a square, and a regular hexagon inscribed in a circle.*

2. POINTS, LINES, AND ANGLES

- **POINTS, RAYS, LINE SEGMENTS, LINES, AND FIGURES**

- **PARALLEL LINES AND ANGLE RELATIONSHIPS**

- **RLT.G.2.a** *prove two or more lines are parallel; and*
- **RLT.G.2.b** *solve problems, including practical problems, involving angles formed when parallel lines are intersected by a transversal.*

- **PERPENDICULAR BISECTOR AND ANGLE BISECTOR THEOREMS**

- **RLT.G.1.c** determining the validity of a logical argument.
- **RLT.G.4.d** a perpendicular to a given line at a given point on the line;

3. COORDINATE GEOMETRY

- **LENGTH AND THE DISTANCE FORMULA**

- **RLT.G.3.a** investigating and using formulas for determining distance, midpoint, and slope;

- **MIDPOINT FORMULA ON THE COORDINATE PLANE**

- **RLT.G.3.a** investigating and using formulas for determining distance, midpoint, and slope;

- **CONJECTURES IN COORDINATE GEOMETRY**

- **RLT.G.3.b** applying slope to verify and determine whether lines are parallel or perpendicular;
- **RLT.G.3.c** investigating symmetry and determining whether a figure is symmetric with respect to a line or a point; and

4. TRANSFORMATIONS AND CONGRUENCE

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

- **T.DF.G.14.d** solving problems, including practical problems, about similar geometric figures.
- **RLT.G.3.c** investigating symmetry and determining whether a figure is symmetric with respect to a line or a point; and
- **RLT.G.3.d** determining whether a figure has been translated, reflected, rotated, or dilated, using coordinate methods.

- **TRIANGLES AND CONGRUENCE TRANSFORMATIONS**

- **T.G.6** The student, given information in the form of a figure or statement, will prove two triangles are congruent.

- **CONGRUENCE OF OTHER POLYGONS**

- **PC.G.9** The student will verify and use properties of quadrilaterals to solve problems, including practical problems.
- **RLT.G.3.c** investigating symmetry and determining whether a figure is symmetric with respect to a line or a point; and

5. SIMILARITY

- **TRIANGLES AND SIMILARITY TRANSFORMATIONS**

- **T.G.7** The student, given information in the form of a figure or statement, will prove two triangles are similar.
- **T.DF.G.14.d** solving problems, including practical problems, about similar geometric figures.

- **SIMILARITY OF OTHER POLYGONS**

- **PC.G.9** The student will verify and use properties of quadrilaterals to solve problems, including practical problems.
- **T.DF.G.14.a** comparing ratios between lengths, perimeters, areas, and volumes of similar figures;
- **T.DF.G.14.d** solving problems, including practical problems, about similar geometric figures.

6. TRIANGLES

- **CLASSIFYING TRIANGLES**

- **T.G.5.a** ordering the sides by length, given angle measures;
- **T.G.5.b** ordering the angles by degree measure, given side lengths;
- **T.G.5.c** determining whether a triangle exists; and
- **T.G.5.d** determining the range in which the length of the third side must lie.

- **TRIANGLE ANGLE THEOREMS**

- **PC.G.10.b** *measure of an interior and/or exterior angle; and*
- **PC.G.10.a** *sum of the interior and/or exterior angles;*
- **T.G.6** *The student, given information in the form of a figure or statement, will prove two triangles are congruent.*

- **PYTHAGOREAN THEOREM**

- **T.G.8.a** *the Pythagorean Theorem and its converse;*
- **T.G.7** *The student, given information in the form of a figure or statement, will prove two triangles are similar.*

7. QUADRILATERALS AND POLYGONS 1

- **PARALLELOGRAMS AND RECTANGLES**

- **PC.G.9** *The student will verify and use properties of quadrilaterals to solve problems, including practical problems.*

- **SQUARES AND RHOMBI**

- **PC.G.9** *The student will verify and use properties of quadrilaterals to solve problems, including practical problems.*

- **TRAPEZOIDS**

- **PC.G.9** *The student will verify and use properties of quadrilaterals to solve problems, including practical problems.*
- **PC.G.10.c** *number of sides of a regular polygon.*

8. QUADRILATERALS AND POLYGONS 2

- **KITES**

- **PC.G.9** *The student will verify and use properties of quadrilaterals to solve problems, including practical problems.*

- **POLYGON BASICS**

- **PC.G.10.a** *sum of the interior and/or exterior angles;*
- **PC.G.10.b** *measure of an interior and/or exterior angle; and*
- **PC.G.10.c** *number of sides of a regular polygon.*

9. TRIANGLES AND TRIGONOMETRY

- **TRIGONOMETRIC RATIOS**

- **T.G.8.c** *trigonometric ratios.*

- **PROBLEM SOLVING WITH RIGHT TRIANGLES**

- **T.G.7** *The student, given information in the form of a figure or statement, will prove two triangles are similar.*
- **T.G.8.c** *trigonometric ratios.*

- **SPECIAL RIGHT TRIANGLES**

- **T.G.8.b** *properties of special right triangles; and*
- **T.G.7** *The student, given information in the form of a figure or statement, will prove two triangles are similar.*
- **T.DF.G.14.d** *solving problems, including practical problems, about similar geometric figures.*

10. CIRCLES

- **CIRCLE BASICS**

- **PC.G.11.a** *angle measures formed by intersecting chords, secants, and/or tangents;*

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

• CENTRAL ANGLES, INSCRIBED ANGLES, AND CHORDS

- **PC.G.11.c** arc length; and
- **PC.G.11.a** angle measures formed by intersecting chords, secants, and/or tangents;

• CONGRUENT AND SIMILAR CIRCLES

- **TDF.G.14.a** comparing ratios between lengths, perimeters, areas, and volumes of similar figures;
- **TDF.G.14.d** solving problems, including practical problems, about similar geometric figures.
- **RLT.G.3.d** determining whether a figure has been translated, reflected, rotated, or dilated, using coordinate methods.

11. SECANTS AND TANGENTS

• SECANTS, ANGLES, AND INTERCEPTED ARCS

- **PC.G.11.a** angle measures formed by intersecting chords, secants, and/or tangents;
- **PC.G.11.b** lengths of segments formed by intersecting chords, secants, and/or tangents;
- **PC.G.11.c** arc length; and

• TANGENTS, ANGLES, AND INTERCEPTED ARCS

- **PC.G.11.a** angle measures formed by intersecting chords, secants, and/or tangents;
- **PC.G.11.b** lengths of segments formed by intersecting chords, secants, and/or tangents;
- **PC.G.11.c** arc length; and

12. PROPERTIES OF CIRCLES

• CIRCUMFERENCE AND ARC LENGTH

- **PC.G.11.c** arc length; and

• AREA OF CIRCLES AND SECTORS

- **PC.G.11.d** area of a sector.

• CIRCLES

- **PC.G.12** The student will solve problems involving equations of circles.

13. SURFACE AREA

• SURFACE AREA OF PRISMS AND PYRAMIDS

- **TDF.G.13** The student will use surface area and volume of three-dimensional objects to solve practical problems.

• SURFACE AREA OF CYLINDERS AND CONES

- **TDF.G.13** The student will use surface area and volume of three-dimensional objects to solve practical problems.

• SURFACE AREA AND VOLUME OF SPHERES

- **TDF.G.13** The student will use surface area and volume of three-dimensional objects to solve practical problems.

14. VOLUME

• VOLUME OF PRISMS AND PYRAMIDS

- **TDF.G.13** The student will use surface area and volume of three-dimensional objects to solve practical problems.

• VOLUME OF CYLINDERS AND CONES

- **TDF.G.13** *The student will use surface area and volume of three-dimensional objects to solve practical problems.*

15. VOLUME AND SURFACE AREA OF COMPOSITE SOLIDS

- **SURFACE AREA OF COMPOSITE SOLIDS**

- **TDF.G.13** *The student will use surface area and volume of three-dimensional objects to solve practical problems.*

- **VOLUME OF COMPOSITE SOLIDS**

- **TDF.G.13** *The student will use surface area and volume of three-dimensional objects to solve practical problems.*

16. CHANGING DIMENSIONS AND SIMILAR SOLIDS

- **SURFACE AREA OF SIMILAR SOLIDS**

- **TDF.G.13** *The student will use surface area and volume of three-dimensional objects to solve practical problems.*
- **TDF.G.14.a** *comparing ratios between lengths, perimeters, areas, and volumes of similar figures;*
- **TDF.G.14.d** *solving problems, including practical problems, about similar geometric figures.*

- **VOLUME OF SIMILAR SOLIDS**

- **TDF.G.13** *The student will use surface area and volume of three-dimensional objects to solve practical problems.*
- **TDF.G.14.a** *comparing ratios between lengths, perimeters, areas, and volumes of similar figures;*
- **TDF.G.14.d** *solving problems, including practical problems, about similar geometric figures.*

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

- **TDF.G.13** *The student will use surface area and volume of three-dimensional objects to solve practical problems.*
- **TDF.G.14.a** *comparing ratios between lengths, perimeters, areas, and volumes of similar figures;*
- **TDF.G.14.d** *solving problems, including practical problems, about similar geometric figures.*
- **TDF.G.14.b** *determining how changes in one or more dimensions of a figure affect area and/or volume of the figure;*
- **TDF.G.14.c** *determining how changes in area and/or volume of a figure affect one or more dimensions of the figure; and*