

Geometry is a comprehensive course that provides an in-depth exploration of geometric concepts. Through a "Discovery-Confirmation-Practice"-based exploration of these concepts, students are challenged to work toward a mastery of computational skills, to deepen their understanding of key ideas and solution strategies, and to extend their knowledge in a variety of problem-solving applications.

Course topics include reasoning, proof, and the creation of a sound mathematical argument; points, lines, and angles; triangles; quadrilaterals and other polygons; circles; coordinate geometry; and three-dimensional solids. The course concludes with a look at special topics in geometry, such as constructions, symmetry, tessellations, fractals, and non-Euclidean geometry.

Within each Geometry lesson, students are supplied with a post-study Checkup activity that provides them the opportunity to hone their computational skills in a low-stakes, 10-question problem set before moving on to formal assessment. Additionally, many Geometry lessons include interactive-tool-based exercises and math explorations to further connect lesson concepts to a variety of real-world contexts.

To assist students for whom language presents a barrier to learning, this course includes audio resources in both Spanish and English.

The course is built to the National Council of Teachers of Mathematics (NCTM) standards and is aligned with state standards.

Length: Two semesters

UNIT 1: FOUNDATIONS OF GEOMETRY

LESSON 1: ENTERING THE WORLD OF GEOMETRY

Study: Entering the World of Geometry

Learn about and explore examples of geometric reasoning.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Entering the World of Geometry

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 2: INDUCTION: THE SEARCH FOR RULES AND PATTERNS

Study: Induction: The Search for Rules and Patterns

Learn about points, line segments, grouping, similarity, and difference.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Induction: The Search for Rules and Patterns

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 20 points

LESSON 3: DEDUCTION: MAKING A CASE

Study: Deduction: Making a Case

Learn about looking for patterns, making conjectures, cross-referencing to history and science, real-world examples of inductive reasoning, building a triangle, and examples of symmetry.

Duration: 0 hrs 50 mins

Explore: Aristotle

Learn about Aristotelian logic and Aristotle's explanation of motion.

Duration: 0 hrs 20 mins

Explore: Aristotelian Logic

Explore the basics of Aristotelian logic through deductive reasoning and syllogism.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Practice: Safecracker Tool

Use a safecracker tool to apply deductive logic in order to determine number sequences.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Deduction: Making a Case

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 20 points

LESSON 4: THE LOOK AND LANGUAGE OF LOGIC**Study: The Look and Language of Logic**

Learn about the definition of deductive reasoning, postulates and conditional statements, and using deductive reasoning in proofs. Explore a real-world example of deducing dealing with the combination of a lock.

Duration: 0 hrs 50 mins

Explore: Logic

Learn about logical reasoning and its roots in philosophy.

Duration: 0 hrs 20 mins

Explore: Lewis Carroll

Learn about words and phrases that evoke syllogisms as found in Lewis Carroll's *Alice in Wonderland*.

Duration: 0 hrs 20 mins

Explore: Venn

Learn about John Venn and his contributions to logic and probability.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Practice: Venn Diagram Tool

Use a Venn diagram tool to visualize conditional statements.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: The Look and Language of Logic

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 5: INTRODUCTION TO PROOF

Study: Introduction to Proof

Learn about postulates and axioms, givens, proof by contradiction (indirect proof), theorems and corollaries, and the axiomatic method.

Duration: 0 hrs 50 mins

Quiz: Introduction to Proof

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 6: PROOF IN GEOMETRY

Study: Proof in Geometry

Learn about Euclid's *Elements* and real-world applications of geometry like navigation golf.

Duration: 0 hrs 50 mins

Explore: Euclid

Learn about Euclid's approach to deductive reasoning and its fundamental use in geometry.

Duration: 0 hrs 20 mins

Explore: Euclid's Elements

Learn about the 13 books within Euclid's *Elements*.

Duration: 0 hrs 20 mins

Quiz: Proof in Geometry

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 8 points

LESSON 7: WRAP-UP

Practice: Assignment

Submit your work for a set of 20 practice problems.

Duration: 1 hr Scoring: 100 points

Review: Review Exercise

Take part in interactive games to review unit material in preparation for upcoming assessments.

Duration: 1 hr

Discuss: Get My Logic?

Respond to one of three discussion questions asking you to apply methods learned in this unit.

Duration: 0 hrs 20 mins Scoring: 30 points

Test (CS): Foundations of Geometry

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 54 points

Test (TS): Foundations of Geometry

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

LESSON 8: DIAGNOSTIC

Diagnostic: Foundations of Geometry

Take a diagnostic unit test that will generate a study plan based on your responses.

Duration: 0 hrs 40 mins Scoring: 18 points

UNIT 2: POINTS LINES AND ANGLES

LESSON 1: POINTS

Study: Points

Learn about the concept of a point, why points have no size, and Euclid's definition of a point.

Duration: 0 hrs 50 mins

Quiz: Points

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 2: SEGMENTS

Study: Segments

Learn the notation for a line segment using its endpoints. Explore line segment length and the distance between points on a segment. Investigate midpoints of line segments and the segment addition postulate.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Segments

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

LESSON 3: RAYS LINES AND ANGLES

Study: Rays Lines and Angles

Learn about the relationship of rays, lines, and angles to direction; the definition of a line; notation for rays and lines; building and defining an angle (including its vertex and sides); conventions for naming angles; and straight and zero angles.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Rays Lines and Angles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 4: MORE ABOUT ANGLES

Study: More about Angles

Learn about measuring angles; units; notation; measuring a segment using a protractor; acute, obtuse, and right angles; equations for adjacent angles; angle bisectors; linear pairs; and complementary and supplementary angles.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Identifying Types of Angles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 22 points

Quiz: Angle Bisectors and Adjacent Angles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 5: CONGRUENT SEGMENTS AND ANGLES

Study: Congruent Segments and Angles

Learn about the definitions of congruent line segments and angles; notation; the midpoint theorem; and congruence vs. equality.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Congruent Segments and Angles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 6: PLANES AND THE SPACE OF GEOMETRY

Study: Planes and the Space of Geometry

Learn about dimensionality, collinear points, two-dimensional objects, the geometric plane, the flat plane postulate, coplanar objects, and three-dimensional objects (solids).

Duration: 0 hrs 50 mins

Explore: Abbott's *Flatland*

Discuss Edwin A. Abbott's novel *Flatland: A Romance of Many Dimensions* and its use of geometric ideas in Victorian society.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Planes and the Space of Geometry

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 20 points

LESSON 7: WHAT IT IS LIKE TO LIVE IN A PLANE

Study: What It is Like to Live in a Plane

Take part in a flatland exercise dealing with location and direction in two dimensions.

Duration: 0 hrs 50 mins

Practice: Spider Tool

Use a spider tool to draw and investigate star polygons.

Duration: 0 hrs 30 mins Scoring: 25 points

LESSON 8: INTERSECTING LINES

Study: Intersecting Lines

Learn about intersections that form vertical angles; the vertical angle theorem; perpendicular lines, rays, and segments; distance and length; and perpendicular bisectors.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Intersecting Lines

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 9: PARALLEL LINES

Study: Parallel Lines

Learn about skew lines; coplanar lines that do not intersect; parallel line notation; transversals and corresponding angles; alternate interior angles; consecutive interior angles; and parallel line theorems.

Duration: 0 hrs 50 mins

Explore: Sundials

Learn about sundials and how they were used to tell time.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Parallel Lines

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

LESSON 10: SOLVING THE MIRROR PROBLEM**Study: Solving the Mirror Problem**

Learn about applying theorems from this unit to the problem of measuring light reflected off a mirror. Learn about the law of reflection.

Duration: 0 hrs 50 mins

Explore: Periscopes

Learn about the importance of periscopes and how they are used in the military.

Duration: 0 hrs 20 mins

Explore: Sextants

Learn about the five major parts of a sextant and how the tool is used.

Duration: 0 hrs 20 mins

LESSON 11: WRAP-UP**Practice: Assignment**

Submit your work for a set of 20 practice problems.

Duration: 1 hr Scoring: 100 points

Review: Review Exercise

Take part in interactive games to review unit material in preparation for upcoming assessments.

Duration: 1 hr

Discuss: What if You Lived in Flatland?

Respond to one of three discussion questions asking you to apply methods learned in this unit.

Duration: 0 hrs 20 mins Scoring: 30 points

Test (CS): Points Lines and Angles

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 75 points

Test (TS): Points Lines and Angles

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

LESSON 12: DIAGNOSTIC**Diagnostic: Points Lines and Angles**

Take a diagnostic unit test that will generate a study plan based on your responses.

UNIT 3: TRIANGLES

LESSON 1: WHAT IS A TRIANGLE?

Study: What Is a Triangle?

Learn about the definition and parts of a triangle; opposite and included figures; naming and sorting triangles; equilateral, isosceles, and scalene triangles; and the triangle inequality theorem.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Naming Triangles by Angle Measures

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

Quiz: Naming Triangles by Side Lengths

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

Quiz: The Triangle Inequality Theorem

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 22 points

LESSON 2: THE ANGLES OF A TRIANGLE

Study: The Angles of a Triangle

Explore the angle sum theorem and third angle theorem for triangles. Learn the meaning behind the statement "QED." Investigate the relationship between a given triangle's vertex and its exterior and remote interior angles.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Angle Theorems

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 20 points

Quiz: Exterior and Remote Interior Angles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 3: CONGRUENCE

Study: Congruence

Learn about congruence transformations of triangles, corresponding triangles, notation for writing congruence statements, and the CPCTC triangle congruence theorem.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Practice: Congruence and Similarity Tool

Use a congruence and similarity tool to determine if polygons are congruent or similar.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Congruent Triangles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

Quiz: Properties of Congruence

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

LESSON 4: CONGRUENCE POSTULATES

Study: Congruence Postulates

Learn about postulates, including the SSS, SAS, ASA, and AAS theorems.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Practice: Triangle Builder Tool

Use a triangle-builder tool to construct triangles and determine whether they are congruent.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Using Congruence Postulates

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 20 points

Quiz: The AAS Theorem

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 20 points

LESSON 5: PROOFS OF CONGRUENCE

Study: Proofs of Congruence

Learn about proving that parts of triangles are congruent using Thales's method for measuring the distance from ship to shore.

Duration: 0 hrs 50 mins

Quiz: Proofs of Congruence

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 6: SIMILAR TRIANGLES

Study: Similar Triangles

Learn about similarity vs. congruence, testing for similarity among triangles, proportionality, the definition of similar triangles, and the scale factor.

Duration: 0 hrs 50 mins

Explore: Sierpinski Triangle

Learn about the Sierpinski triangle and fractals.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Practice: Congruence and Similarity Tool

Investigate the properties of similar triangles using an interactive tool.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Similar Triangles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 28 points

LESSON 7: RATIOS AND PROPORTIONS**Study: Ratios and Proportions**

Learn about ratios, proportions, means, and extremes. Learn about applying the cross product property application to the student-teacher ratio problem and the photo-enlargement problem.

Duration: 0 hrs 50 mins

Explore: Golden Ratio

Learn about the golden rectangle and why it is called the golden ratio.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Ratios and Proportions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

LESSON 8: SIMILARITY THEOREMS**Study: Similarity Theorems**

Learn about the ASA similarity postulate, SSS similarity theorem, and SAS similarity theorem.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Practice: Spider Tool

Use a spider tool to visualize lines, angles, and shapes of plane geometry; experiment with motion in two dimensions and draw all types of triangles.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Similarity Theorems

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 22 points

LESSON 9: TRIANGLE THEOREMS**Study: Triangle Theorems**

Learn and prove the isosceles triangle theorem and its converse. Investigate two corollaries involving angle measures for equilateral triangles. Explore theorems for scalene triangles. Apply what is learned to solve Thales's problem.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Isosceles and Equilateral Triangles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

Quiz: Scalene Triangles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 10: MEDIANS ALTITUDES AND BISECTORS

Study: Medians Altitudes and Bisectors

Identify and explore medians, altitudes, angle bisectors, and perpendicular bisectors of triangles. Discover their relationship to centroids, orthocenters, incenters, and circumcenters.

Duration: 0 hrs 50 mins

Quiz: Medians Altitudes and Bisectors

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 11: THE PARALLAX PROBLEM

Study: The Parallax Problem

Learn to apply the concepts of congruence, similarity, ratio, and proportion to the solution of a real-world parallax problem.

Duration: 0 hrs 50 mins

Explore: Parallax

Learn about parallax and its importance in astronomy.

Duration: 0 hrs 20 mins

LESSON 12: WRAP-UP

Practice: Assignment

Submit your work for a set of 20 practice problems.

Duration: 1 hr Scoring: 100 points

Review: Review Exercises

Take part in interactive games to review unit material in preparation for upcoming assessments.

Duration: 1 hr

Discuss: The Well-Balanced Triangle

Respond to one of three discussion questions asking you to apply methods learned in this unit.

Duration: 0 hrs 20 mins Scoring: 30 points

Test (CS): Triangles

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 75 points

Test (TS): Triangles

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

LESSON 13: DIAGNOSTIC

Diagnostic: Triangles

Take a diagnostic unit test that will generate a study plan based on your responses.

Duration: 0 hrs 40 mins Scoring: 25 points

UNIT 4: RIGHT TRIANGLES

LESSON 1: AREA OF A TRIANGLE

Study: Area of a Triangle

Learn about the area of a polygon, square units, and the triangle area formula and theorem.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Area of a Triangle

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

LESSON 2: THE PYTHAGOREAN THEOREM

Study: The Pythagorean Theorem

Learn about how the Pythagorean theorem applies only to right triangles and discover one proof of it. Learn about the converse of the Pythagorean theorem, Pythagorean triples, and applying the theorem to the problem of fitting a baseball bat into a rectangular trunk.

Duration: 0 hrs 50 mins

Explore: Pythagoras

Learn about Pythagoras and his contribution to mathematics.

Duration: 0 hrs 20 mins

Explore: Pythagorean Theorem

Learn about Pythagoras, the Pythagorean theorem, and Pythagorean triples.

Duration: 0 hrs 20 mins

Explore: Fermat's Last Theorem

Learn about Pierre de Fermat's last theorem and the history behind it.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Practice: Spider Tool

Use a spider tool to draw triangles and investigate Pythagorean triples.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: The Pythagorean Theorem

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 3: CONGRUENT RIGHT TRIANGLES

Study: Congruent Right Triangles

Learn about the HL, LL, HA, LA, and perpendicular bisector theorems. Learn about the angle bisector theorem and its converse.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Practice: Triangle Builder Tool

Use a triangle-builder tool to build congruent triangles.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Proving Right Triangle Congruence

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 26 points

Quiz: Right Triangle Measurements

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

LESSON 4: SIMILAR RIGHT TRIANGLES

Study: Similar Right Triangles

Explore the properties of similar right triangles and prove that if an altitude is drawn from the right-angle vertex of a right triangle to its hypotenuse, then three similar triangles are formed. Calculate the missing sides of similar right triangles using proportions, and apply concepts learned to a miniature-golf problem.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Similar Right Triangles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 5: SPECIAL RIGHT TRIANGLES

Study: Special Right Triangles

Explore 45-45-90 and 30-60-90 triangles as special cases of right triangles and learn how to apply the ratios of their side lengths.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: 45-45-90 Right Triangles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

Quiz: 30-60-90 Right Triangles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 12 points

LESSON 6: TRIGONOMETRIC RATIOS

Study: Trigonometric Ratios

Learn the definitions of *sine*, *cosine*, and *tangent*. Memorize “soh-cah-toa” as a mnemonic device relating to these ratios. Explore the use of trigonometric ratios in the solution of a real-world problem involving the construction of a cable car.

Duration: 0 hrs 50 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 30 mins

Quiz: Trigonometric Ratios

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 7: WRAP-UP

Practice: Assignment

Submit your work for a set of 20 practice problems.

Duration: 1 hr Scoring: 100 points

Review: Review Exercise

Take part in interactive games to review unit material in preparation for upcoming assessments.

Duration: 1 hr

Discuss: A Closer Look at a Baseball Diamond

Students respond to one of three discussion questions asking them to apply methods learned in this unit.

Duration: 0 hrs 20 mins Scoring: 30 points

Test (CS): Right Triangles

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 75 points

Test (TS): Right Triangles

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

LESSON 8: DIAGNOSTIC

Diagnostic: Right Triangles

Take a diagnostic unit test that will generate a study plan based on your responses.

Duration: 0 hrs 40 mins Scoring: 25 points

UNIT 5: GEOMETRY SEMESTER 1 REVIEW AND EXAM

LESSON 1: PREPARING FOR THE SEMESTER EXAM

Review: Semester Review

Prepare for the semester exam by reviewing key concepts covered in Geometry Semester 1.

Duration: 1 hr

Exam: Semester Exam

Duration: 0 hrs 50 mins Scoring: 220 points

UNIT 6: QUADRILATERALS AND OTHER POLYGONS

LESSON 1: POLYGONS AND QUADRILATERALS

Study: Polygons and Quadrilaterals

Learn about the definitions of a polygon and a quadrilateral and the relationship of one to the other; identifying and naming polygons and quadrilaterals; and convex, concave, regular, congruent, and similar polygons.

Duration: 0 hrs 40 mins

Explore: Oriental Rugs

Learn about oriental rugs and how the patterns woven into them illustrate geometric shapes and patterns.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Identifying and Naming Polygons and Quadrilaterals

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

Quiz: Sorting and Recognizing Polygons

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 2: ANGLE SUMS OF A POLYGON

Study: Angle Sums of a Polygon

Learn about the diagonal of a polygon, the formula for the sum of the measures of a polygon's interior angles, and exterior angles and a theorem for the sum of their measures.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Practice: Interior Angles Tool

Use an interior angles tool to find the sums of the interior angles of various polygons.

Duration: 0 hrs 30 mins Scoring: 25 points

Practice: Exterior Angles Tool

Use an exterior angles tool to find the sum of the exterior angles of various polygons.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Angle Sums of a Polygon

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 3: PARALLELOGRAMS

Study: Parallelograms

Learn about the definition of a parallelogram, properties and theorems of parallelograms, consecutive angle pairs, and diagonals.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Parallelograms

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 4: TESTS FOR PARALLELOGRAMS

Study: Tests for Parallelograms

Explore parallelogram theorems involving opposite side lengths, opposite and consecutive angle measures, and bisecting diagonals. Then work through a sample proof.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Tests for Parallelograms

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 5: RECTANGLES

Study: Rectangles

Learn about the definition of a rectangle, congruent diagonal theorems, and right angle theorems. Explore a sample problem case study about proving that a window is rectangular using the congruent diagonal theorem.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Rectangles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 28 points

LESSON 6: RHOMBI AND SQUARES

Study: Rhombi and Squares

Identify the properties and definitions of a rhombus and a square. Prove that the diagonals of a rhombus are perpendicular. Investigate how diagonals of a rhombus bisect opposite vertices. Apply the properties of rhombi and squares to find missing side lengths, diagonal lengths, and angle measures.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Rhombi and Squares

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 7: TRAPEZOIDS

Study: Trapezoids

Learn the definition of a trapezoid and identify its parts. Explore how base angles and diagonals of an isosceles trapezoid are congruent. Investigate the medians of a trapezoid. Apply the properties of trapezoids and isosceles trapezoids to find missing side lengths and median lengths.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Trapezoids

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 8: AREA AND PERIMETER OF QUADRILATERALS

Study: Area and Perimeter of Quadrilaterals

Learn about the formulas for the perimeter of a parallelogram, a rhombus, and a square and for the area of a polygon, rectangle, and square. Complete a sample problem in which you must calculate the area of a square. Learn about the altitude, base, and height of parallelograms and the formulas for the area of a parallelogram and a trapezoid.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Practice: Area Builder Tool

Use an area-builder tool to relate the area and perimeter of polygons.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Area and Perimeter of Quadrilaterals

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

Quiz: Area of Rhombi and Trapezoids

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 22 points

LESSON 9: AREA AND PERIMETER OF POLYGONS**Study: Area and Perimeter of Polygons**

Find the perimeter of any polygon. Determine the areas of irregular polygons by breaking them up into quadrilaterals and regular polygons. Use the apothem formula to find the area of a regular polygon. Complete sample problems about the area of irregular polygons.

Duration: 0 hrs 40 mins

Explore: Surveying

Learn about mapping and measuring the surface of the Earth. Discover transit and theodolite surveying tools.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Area and Perimeter of Polygons

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 26 points

LESSON 10: WRAP-UP**Practice: Assignment**

Submit your work for a set of 20 practice problems.

Duration: 0 hrs 50 mins Scoring: 100 points

Review: Review Exercises

Take part in interactive games to review unit material in preparation for upcoming assessments.

Duration: 0 hrs 30 mins

Discuss: Parts Bits and Pieces

Respond to one of four discussion questions asking you to apply methods learned in this unit.

Duration: 0 hrs 20 mins Scoring: 30 points

Test (CS): Quadrilaterals and Other Polygons

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 75 points

Test (TS): Quadrilaterals and Other Polygons

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

LESSON 11: DIAGNOSTIC**Diagnostic: Quadrilaterals and Other Polygons**

Take a diagnostic unit test that will generate a study plan based on your responses.

UNIT 7: CIRCLES

LESSON 1: WHAT IS A CIRCLE?

Study: What Is a Circle?

Learn about the definition of a circle and about its center, radius, and circumference.

Duration: 0 hrs 40 mins

Explore: Stonehenge

Explore the geometric design of Stonehenge.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: What Is a Circle?

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 2: CHORDS

Study: Chords

Investigate the properties and definitions of chords and diameters. Discover that two chords are congruent if they are the same distance from the center of the circle. Prove that the radius bisects a chord if it is perpendicular to the chord.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Congruent Chords

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 26 points

Quiz: Chords and Perpendicular Radii

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 22 points

Quiz: Diameter of a Circle

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

LESSON 3: ARCS

Study: Arcs

Learn about the definitions of arc, endpoint, central angle, and intercept. Learn about minor and major arcs and semicircles, arc notation, the measure of minor and major arcs, and the arc congruence and congruent chord theorems.

Duration: 0 hrs 40 mins

Explore: Vermeer

Learn about the painter Jan Vermeer and his rendering of light.

Duration: 0 hrs 20 mins

Explore: Time

Learn about time in ancient civilizations, daylight savings time, leap years, time zones, and the prime meridian.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Arc Types and Measure

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

Quiz: Congruent Chords and Circle Angle Measure

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 4: CIRCLES AND ANGLES

Study: Circles and Angles

Learn the definition of an inscribed angle. Experiment with inscribed angles and their intercepted arcs. Discover and prove that an inscribed angle is half the measure of its intercepted arc. Discover and prove the intersecting chord theorem.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Inscribed Angles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

Quiz: Intersecting Chord Theorem

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 22 points

LESSON 5: SECANTS AND TANGENTS

Study: Secants and Tangents

Learn about the definition of secant and about secant-secant angle, its theorem, and proving the theorem. Learn about tangent line, point of tangency and tangent segments, tangents perpendicular to a circle's radius, a tangent-tangent angle and its theorem, and a tangent-chord angle and its theorem; explore a sample proof.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Secant-Secant Angles

Quiz on secant-secant angles

Duration: 0 hrs 25 mins Scoring: 22 points

Quiz: Tangent-Chord Angles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

Quiz: Tangent-Tangent Angles and Their Intercepted Arcs

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 14 points

LESSON 6: CIRCUMFERENCE AND ARC LENGTH

Study: Circumference and Arc Length

Learn about the irrational number pi and the formula for finding the circumference of a circle. Apply circumference to a real-world problem involving the raising of a highway over a river to allow for boating traffic underneath. Learn about the degree measure of an arc and arc length. Derive the formula for arc length.

Duration: 0 hrs 40 mins

Explore: Circles in Literature

Learn about how circles are depicted as perfection in literature.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Circumference of a Circle

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 14 points

Quiz: Arc Length

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 26 points

LESSON 7: AREA AND SECTORS

Study: Area and Sectors

Learn about the formula for the area of a circle. Explore a case study comparing the cost per square inch of small and large pizzas. Learn about sectors and the area of a sector.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Area of a Circle

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 20 points

Quiz: Area of a Sector

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 26 points

LESSON 8: CIRCLES AND TRIANGLES

Study: Circles and Triangles

Learn about inscribed objects, the definition of incenter, circumscribed objects, and the definition of circumcenter.

Duration: 0 hrs 40 mins

Quiz: Circles and Triangles

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 28 points

LESSON 9: CIRCLES AND POLYGONS

Study: Circles and Polygons

Learn about the theorem of a quadrilateral inscribed in a circle and the theorem of a parallelogram inscribed in a circle.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Circles and Polygons

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 10: WRAP-UP**Practice: Assignment**

Submit your work for a set of 20 practice problems.

Duration: 0 hrs 50 mins Scoring: 100 points

Review: Review Exercise

Take part in interactive games to review unit material in preparation for upcoming assessments.

Duration: 0 hrs 30 mins

Discuss: A Circular Peg within A Square Hole

Respond to one of three discussion questions asking you to apply methods learned in this unit.

Duration: 0 hrs 20 mins Scoring: 30 points

Test (CS): Circles

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 75 points

Test (TS): Circles

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

LESSON 11: DIAGNOSTIC**Diagnostic: Circles**

Take a diagnostic unit test that will generate a study plan based on your responses.

Duration: 0 hrs 40 mins Scoring: 25 points

UNIT 8: COORDINATE GEOMETRY**LESSON 1: THE CARTESIAN COORDINATE SYSTEM****Study: The Cartesian Coordinate System**

Learn about René Descartes, latitude and longitude as a grid, the Cartesian coordinate system as perpendicular number lines, axes and the origin, the xy -plane, x - and y -coordinates, and ordered pairs.

Duration: 0 hrs 40 mins

Explore: The Equator

Learn about the equator as a key concept in our understanding of the shape, size, and behavior of the Earth.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Practice: Graphing Tool

Use a graphing tool to find distances.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: The Cartesian Coordinate System

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 2: MIDPOINT FORMULA

Study: Midpoint Formula

Learn about the midpoints of horizontal, vertical, and diagonal line segments and about the midpoint formula. Complete a sample problem.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Practice: Graphing Tool

Use a graphing tool to find distances.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Midpoint Formula

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 3: THE DISTANCE FORMULA

Study: The Distance Formula

Derive the distance formula from the Pythagorean theorem. Use this formula to calculate the distance between any two points. Apply the distance formula in a real-world problem that involves locating the shortest route on a nautical map.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Practice: Graphing Tool

Use a graphing tool to find distances.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: The Distance Formula

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 20 points

LESSON 4: COORDINATES AND DATA

Study: Coordinates and Data

Learn about graphs and the Cartesian coordinate system, plotting data points, looking for patterns, finding correlations, dependent and independent variables, the line of best fit, and deviation and range.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Coordinates and Data

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 5: PATTERNS AND LINES

Study: Patterns and Lines

Learn about data points that form a straight line, linear equations, and ordered pairs.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Practice: Graphing Tool

Use a graphing tool to find distances.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Patterns and Lines

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 6: SLOPE

Study: Slope

Learn about measuring slope, rise, and run; the slope formula; negative zero and undefined slope; and measuring the rate of change of a dependent variable.

Duration: 0 hrs 40 mins

Explore: Topographical Maps

Learn about topographical maps and how they are used to determine locations.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Computing Slope

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

Quiz: Special Cases of Slope

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 7: THE RESCUE SHIP PROBLEM

Study: The Rescue Ship Problem

Explore a case study about using the slope formula and a parallel rule to steer a ship through dangerous waters.

Duration: 0 hrs 40 mins

Explore: Parallel Rules

Learn how to read nautical charts. Explore the development of parallel rules.

Duration: 0 hrs 20 mins

LESSON 8: PARALLEL AND PERPENDICULAR LINES

Study: Parallel and Perpendicular Lines

Learn about the definition and slopes of parallel and perpendicular lines. Learn about negative reciprocals.

Duration: 0 hrs 40 mins

Explore: Linear Perspective

Learn about linear perspective in art, the vanishing point, and horizontal lines.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Parallel and Perpendicular Lines

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 26 points

LESSON 9: EQUATIONS OF LINES

Study: Equations of Lines

Learn about and explore examples of properties of lines, the y -intercept, the slope-intercept equation, and the point-slope equation.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Practice: Graphing Tool

Use a graphing tool to find distances.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Equations of Lines

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 28 points

Quiz: Equations of Lines -- Part 2

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 10: CIRCLES

Study: Circles

Use algebra to find an equation whose solution set is a circle. Learn about the standard equation for circles not centered at the origin.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Practice: Graphing Tool

Use a graphing tool to find distances.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Circles Centered at the Origin

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 20 points

Quiz: Circles Not Centered at the Origin

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 22 points

LESSON 11: WRAP-UP

Practice: Assignment

Submit your work for a set of 20 practice problems.

Duration: 0 hrs 50 mins Scoring: 100 points

Review: Review Exercise

Take part in interactive games to review unit material in preparation for upcoming assessments.

Duration: 0 hrs 30 mins

Discuss: Graph Paper Puzzles

Respond to one of three discussion questions asking you to apply methods learned in this unit.

Duration: 0 hrs 20 mins Scoring: 30 points

Test (CS): Coordinate Geometry

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 75 points

Test (TS): Coordinate Geometry

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

LESSON 12: DIAGNOSTIC

Diagnostic: Coordinate Geometry

Take a diagnostic unit test that will generate a study plan based on your responses.

Duration: 0 hrs 40 mins Scoring: 25 points

UNIT 9: THREE-DIMENSIONAL SOLIDS

LESSON 1: THREE DIMENSIONS

Study: Three Dimensions

Learn about measuring three-dimensional figures.

Duration: 0 hrs 40 mins

Practice: Polyhedron Turner Tool

Use a polyhedron-turner tool to view polyhedrons from various angles.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Three Dimensions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 2: WHAT IS A POLYHEDRON?

Study: What is a Polyhedron?

Learn about the definition and elements of a polyhedron, prisms and their components, triangular and rectangular prisms, cubes, and regular and irregular pyramids.

Duration: 0 hrs 40 mins

Practice: Polyhedron Grower Tool

Use a polyhedron-grower tool to visualize the relationships between dimensions.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: What is a Polyhedron?

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 3: CYLINDERS AND CONES

Study: Cylinders and Cones

Learn about the definition, components, and properties of a cylinder; the definition and components of a cone; and the

similarities between cones and pyramids.

Duration: 0 hrs 40 mins

Quiz: Cylinders and Cones

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 22 points

LESSON 4: PLATONIC SOLIDS

Study: Platonic Solids

Learn about polygonal numbers, regularity of Platonic solids, and building your own Platonic solids.

Duration: 0 hrs 40 mins

Explore: Plato

Learn about Plato as a philosopher and mathematician and about his works regarding solids.

Duration: 0 hrs 20 mins

Explore: Euler

Learn about Leonhard Euler and his work using e , l , and $f(x)$ that helped to standardize mathematical notation.

Duration: 0 hrs 20 mins

Practice: Polyhedron Folder Tool

Use a polyhedron-folder tool to view faces, edges, and vertices.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Platonic Solids

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 5: SURFACE AREA

Study: Surface Area

Learn about perimeter and surface area; base and lateral area; the formulae for lateral and surface area of a right prism, the surface area of an oblique prism, and the surface area of a pyramid; the formulae for lateral and surface area of a regular pyramid; slant height vs. altitude; and the formulae for lateral and surface area of a right cylinder, surface area of an oblique cylinder, and surface area of right and oblique cones. Explore sample problems dealing with these subjects.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Surface Area of Regular Prisms and Pyramids

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

Quiz: Surface Area of Right Cylinders and Cones

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 22 points

LESSON 6: VOLUME

Study: Volume

Learn about area and volume; the formulae for volume of a cube and a rectangular prism; and Bonaventura Francesco Cavalieri's principle. Learn about the formulae for volume of a cylinder, a pyramid, and a cone; explore sample problems dealing with these formulae. Learn about cross-sectional area.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Practice: Cavalieri Tool

Use the interactive Cavalieri tool to investigate relationships between the cross-sections of solids.

Duration: 0 hrs 30 mins Scoring: 25 points

Practice: Cube Splitter Tool

Use the interactive cube splitter tool to investigate the relationship between the volume of prisms and pyramids with the same base area and height.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Volume of Prisms Cylinders and Cubes

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 28 points

Quiz: Volume of Cones Cylinders and Pyramids

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 7: SPHERES

Study: Spheres

Learn about the definition of a sphere; the formulae for surface area and volume of a sphere; comparing the surface area and volume of a sphere, cube, cylinder, and cone; and deriving the formula for volume of a sphere using Cavalieri's principle.

Duration: 0 hrs 40 mins

Explore: Celestial Sphere

Learn about the geocentric view of the world; the extension of Earth's poles; the equator; longitude and latitude; and lines into space.

Duration: 0 hrs 20 mins

Explore: Architectural Designs

Learn about architectural designs and their origins in geometric shapes and figures. Discover how math and creativity result in wonderful buildings and objects.

Duration: 0 hrs 20 mins

Explore: Ferdinand Magellan

Learn about Ferdinand Magellan as an explorer who circled the globe. Discover details of his expeditions.

Duration: 0 hrs 20 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Spheres

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 8: SIMILAR SOLIDS

Study: Similar Solids

Learn about similar prisms, pyramids, cylinders, cones, and spheres; the constant ratio between corresponding parts of similar solids; and the ratio of volumes of similar solids.

Duration: 0 hrs 40 mins

Checkup: Practice Problems

Complete a set of practice problems to hone your calculation skills.

Duration: 0 hrs 25 mins

Quiz: Similar Solids

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 9: WRAP-UP

Practice: Assignment

Submit your work for a set of 20 practice problems.

Duration: 0 hrs 50 mins Scoring: 100 points

Review: Review Exercises

Take part in interactive games to review unit material in preparation for upcoming assessments.

Duration: 0 hrs 30 mins

Discuss: Polyhedron Tinker Toys

Respond to one of three discussion questions asking you to apply methods learned in this unit.

Duration: 0 hrs 20 mins Scoring: 30 points

Test (CS): Three-Dimensional Solids

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 75 points

Test (TS): Three-Dimensional Solids

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

LESSON 10: DIAGNOSTIC

Diagnostic: Three-Dimensional Solids

Take a diagnostic unit test that will generate a study plan based on your responses.

Duration: 0 hrs 40 mins Scoring: 25 points

UNIT 10: TOPICS IN GEOMETRY

LESSON 1: CONSTRUCTIONS

Study: Constructions

Learn about using a straightedge and a compass; common notions of Euclidean geometry; five postulates; constructing an equilateral triangle and a regular hexagon; bisecting an angle; and constructing a perpendicular bisector.

Duration: 0 hrs 40 mins

Explore: The Compass in Literature

Learn about circles and compasses and their role in inspiring poets like John Milton, who wrote *Paradise Lost*.

Duration: 0 hrs 20 mins

Practice: Construction Tool

Use a construction tool to build geometric figures.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Constructions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 20 points

LESSON 2: PAPER FOLDING

Study: Paper Folding

Learn about constructing geometric solids with folding paper, coinciding objects, bisecting an angle, and constructing a parallel line segment.

Duration: 0 hrs 40 mins

Explore: Origami

Discover the art of paper folding and learn about its use of complex geometric patterns.

Duration: 0 hrs 20 mins

Practice: Paper Folding Tool

Use a paper-folding tool to construct geometric figures.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Paper Folding

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

LESSON 3: SYMMETRY

Study: Symmetry

Learn about reflectional symmetry and line of symmetry and explore example of an isosceles triangle. Learn about rotational symmetry, point of symmetry, and the symmetry of a human face.

Duration: 0 hrs 40 mins

Explore: Symmetry in the Arts

Explore examples of places and items in the arts that are symmetrical.

Duration: 0 hrs 20 mins

Explore: Symmetry in Nature

Learn about symmetry and explore examples of it in biology, architecture, and art.

Duration: 0 hrs 20 mins

Practice: Symmetry Tool

Use a symmetry tool to view reflectional and axis symmetry.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Symmetry

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 24 points

LESSON 4: TESSELLATIONS

Study: Tessellations

Learn the definition and explore examples of tessellations. Discover the chessboard as an example of a regular tessellation. Learn about semiregular tessellations.

Duration: 0 hrs 40 mins

Explore: Tessellations

Learn about tessellations and how they are made. Learn about regular tessellations, semiregular tessellations, M.C. Escher, and where you can find tessellations in the different disciplines.

Duration: 0 hrs 20 mins

Explore: M.C. Escher

Learn about Escher and his symmetrical patterns and perspectives. Discover his famous work *Ascending and Descending*.

Duration: 0 hrs 20 mins

Explore: Mosaics

Learn about mosaics in earlier civilizations and how they endure to this day.

Duration: 0 hrs 20 mins

Practice: Tessellation Tool

Use a tessellation tool to tessellate figures.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Tessellations

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 18 points

LESSON 5: FRACTALS

Study: Fractals

Learn about self-similarity of fractals; the golden rectangle; making a Sierpinski gasket; the Koch curve; a Cantor dust; examples of infinite length in nature; Zeno's paradox; self-similarity in biological organisms; fern fractals; Mandelbrot sets; fractals and recursion; and fractional dimension.

Duration: 0 hrs 40 mins

Explore: Fractals

Learn about fractal geometry, Benoit Mandelbrot applications in computer science, self-similar shapes, and iterations.

Duration: 0 hrs 20 mins

Explore: Mandelbrot Set

Learn about the life of Benoit Mandelbrot. Discover the Mandelbrot set and its basic principles of fractal geometry.

Duration: 0 hrs 20 mins

Explore: Sierpinski Triangle

Explore the Sierpinski Triangle fractal and its properties.

Duration: 0 hrs 20 mins

Practice: Mandelbrot Set Tool

Use a Mandelbrot set tool to explore the recursive nature of fractals.

Duration: 0 hrs 30 mins Scoring: 25 points

Practice: Sierpinski Fractal Tool

View a graphic of the Sierpinski triangle; learn how the triangles are formed.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Fractals

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 26 points

LESSON 6: LOCUS OF POINTS

Study: Locus of Points

Learn about defining objects in terms of points and given distances. Explore examples of a parabola and bisecting angles.

Duration: 0 hrs 40 mins

Explore: Global Positioning System

Learn about GPS navigation systems and how they use satellites to pinpoint locations.

Duration: 0 hrs 20 mins

Quiz: Locus of Points

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 7: NON-EUCLIDEAN GEOMETRY

Study: Non-Euclidean Geometry

Learn about the Playfair axiom (parallel postulate); examples of non-Euclidean geometry; Georg Friedrich Bernhard Riemann's negation; great circles; Nikolai Ivanovich Lobachevsky's negation; hyperbolic geometry; Henri Poincaré's disk; Euclidean geometry as a subset of a complete geometric system; and characteristics of spherical and hyperbolic geometry.

Duration: 0 hrs 40 mins

Practice: Hyperbolic Line Tool

Use the interactive hyperbolic line tool to confirm that hyperbolic geometry on a Poincaré disc does not include the parallel postulate.

Duration: 0 hrs 30 mins Scoring: 25 points

Quiz: Non-Euclidean Geometry

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 30 points

LESSON 8: IMPOSSIBLE PROBLEMS FROM ANTIQUITY

Study: Impossible Problems from Antiquity

Learn about the Delian problem (doubling a cube) and trisecting an angle.

Duration: 0 hrs 40 mins

Explore: Squaring the Circle

Explore a historical perspective on this impossible geometric construction.

Duration: 0 hrs 20 mins

Explore: Zeno's Paradox

Learn about Zeno of Elea, a Greek philosopher who proposed that the world of the senses is an illusion and that the universe is singular and unchangeable. Explore his ideas about motion and learn how Newton and Gottfried Leibniz responded to them 1,000 years later.

Duration: 0 hrs 20 mins

Quiz: Impossible Problems from Antiquity

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 25 mins Scoring: 16 points

LESSON 9: WRAP-UP

Practice: Assignment

Submit your work for a set of 20 practice problems.

Duration: 0 hrs 50 mins Scoring: 100 points

Review: Review Exercise

Take part in interactive games to review unit material in preparation for upcoming assessments.

Duration: 0 hrs 30 mins

Discuss: Applying What You've Learned

Respond to one of three discussion questions asking you to apply methods learned in this unit.

Duration: 0 hrs 20 mins Scoring: 30 points

Test (CS): Topics in Geometry

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 40 mins Scoring: 75 points

Test (TS): Topics in Geometry

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

LESSON 10: DIAGNOSTIC

Diagnostic: Topics in Geometry

Take a diagnostic unit test that will generate a study plan based on your responses.

Duration: 0 hrs 40 mins Scoring: 25 points

UNIT 11: GEOMETRY SEMESTER 2 REVIEW AND EXAM

LESSON 1: PREPARING FOR THE SEMESTER EXAM

Review: Semester Review

Duration: 1 hr

Exam: Semester Exam

Duration: 0 hrs 50 mins Scoring: 224 points