Geometry provides a curriculum focused on the mastery of critical skills and the understanding of key 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 through a variety of problem-solving applications.

Course topics include reasoning, proof, and the creation of a sound mathematical argument; points, lines, and angles; triangles and right triangles; quadrilaterals and other polygons; circles; coordinate geometry; and three-dimensional solids. The course also includes a look at special topics in geometry, such as constructions, transformations, symmetry and non-Euclidean geometry. The course concludes with geometric models related to probability and statistics.

This course supports all students as they develop computational fluency, deepen conceptual understanding, and apply mathematical process standards. Students begin each lesson by discovering new concepts through guided instruction, and then confirm their understanding in an interactive, feedback-rich environment. Modeling activities equip students with tools for analyzing a variety of real-world scenarios and mathematical ideas. Journaling activities allow students to reason abstractly and quantitatively, construct arguments, critique reasoning, and communicate precisely.

The course is built to the TEKS Geometry Standards.

No required or optional materials.

Length: Two Semesters

Unit 1: Foundations of Geometry

- Induction: The Search for Rules and Patterns
- Deduction: Making a Case
- The Look and Language of Logic
- Introduction to Proofs
- Basic Postulates in Geometry
- Planes and the Space of Geometry
- Intersecting Lines and Proofs
- Parallel Lines and Proofs
- Foundations of Geometry Wrap-Up

Unit 2: Triangles

- What Is a Triangle?
- The Angles of a Triangle

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- Congruence
- Congruence Postulates
- Proofs of Congruence
- Similar Triangles
- Similarity Theorems and Proportional Reasoning
- Triangle Theorems
- Medians and Altitudes
- Bisectors and Midsegments
- Performance Task: The Parallax Problem
- Triangles Wrap-Up

Unit 3: Right Triangles

- The Pythagorean Theorem
- Congruent Right Triangles
- Similar Right Triangles
- Special Right Triangles
- Trigonometric Ratios
- Right Triangles Wrap-Up

Unit 4: Quadrilaterals and Other Polygons

- Angle Sums of a Polygon and Proofs
- Parallelograms and Proofs
- Tests for Parallelograms
- Rectangles
- Rhombi and Squares
- Quadrilaterals and Other Polygons Wrap-Up

Unit 5: Circles Without Coordinates

- What Is a Circle?
- Chords
- Arcs
- Chord and Arc Relationships
- Circles, Angles, and Proofs
- Secants, Tangents, and Proofs
- Circumference and Arc Length
- Area and Sectors
- Circles Without Coordinates Wrap-Up

Unit 6: Semester 1 Exam

- Semester 1 Exam

Unit 7: Coordinate Geometry

- Midpoint Formula
- The Distance Formula
- Patterns and Lines

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- Slope
- Equations of Lines
- Equations of Parallel and Perpendicular Lines and Proofs
- Coordinate Geometry with Polygons
- Area of a Triangle with Coordinate Geometry
- Area and Perimeter of Polygons with Coordinate Geometry
- Area and Perimeter: Changing Dimensions
- Circles with Coordinates and Proofs
- Coordinate Geometry Wrap-Up

Unit 8: Constructions and Transformations

- Constructions
- Transformations
- Symmetry
- Non-Euclidean Geometry
- Constructions and Transformations Wrap-Up

Unit 9: Three-Dimensional Solids

- Three Dimensions
- What Is a Polyhedron?
- Cylinders and Cones
- Surface Area
- Volume
- Spheres
- Similar Solids
- Three-Dimensional Solids Wrap-Up

Unit 10: Applications of Probability

- What Is Probability?
- Counting Principles
- Permutations and Combinations
- Basic Rules of Probability
- Conditional Probability
- Independence
- Geometric Models for Probability and Statistics
- Applications of Probability Wrap-Up

Unit 11: Semester 2 Exam

- Semester 2 Exam

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