

## Geometry - Part A

**COURSE DESCRIPTION:** Students learn to recognize and work with geometric concepts in various contexts. They build on ideas of inductive and deductive reasoning, logic, concepts, and techniques of Euclidean plane and solid geometry and develop an understanding of mathematical structure, method, and applications of Euclidean plane and solid geometry. Students use visualizations, spatial reasoning, and geometric modeling to solve problems. Topics of study include points, lines, and angles; triangles; right triangles; quadrilaterals and other polygons; circles; coordinate geometry; three-dimensional solids; geometric constructions; symmetry; the use of transformations; and non-Euclidean geometries.

**PREREQUISITES:** None

**COURSE LENGTH:** One Semester

**REQUIRED TEXT:** Geometry: A Reference Guide

**MATERIALS LIST:** A drawing compass, protractor, and ruler

### **COURSE OUTLINE:**

#### **Unit 1: An Introduction**

- Semester Introduction
- Basic Geometric Terms and Definitions
- Measuring Length
- Measuring Angles
- Bisectors and Line Relationships
- Relationships between Triangles and Circles
- Transformations
- Using Algebra to Describe Geometry

#### **Unit 2: Methods of Proof and Logic**

- Reasoning, Arguments, and Proof
- Conditional Statements
- Compound Statements and Indirect Proof
- Algebraic Logic

- Inductive and Deductive Reasoning

### **Unit 3: Polygon Basics**

- Polygons and Symmetry
- Quadrilaterals and Their Properties
- Parallel Lines and Transversals
- Converses of Parallel Line Properties
- The Triangle Sum Theorem
- Angles in Polygons
- Midsegments
- Slope

### **Unit 4: Congruent Polygons and Special Quadrilaterals**

- Polygons and Symmetry
- Quadrilaterals and Their Properties
- Parallel Lines and Transversals
- Converses of Parallel Line Properties
- The Triangle Sum Theorem
- Angles in Polygons
- Midsegments
- Slope

### **Unit 5: Perimeter, Area, and Right Triangles**

- Perimeter and Area
- Areas of Triangles and Quadrilaterals
- Circumference and Area of Circles
- The Pythagorean Theorem
- Areas of Special Triangles and Regular Polygons
- Using the Distance Formula
- Proofs and Coordinate Geometry

### **Unit 6: Semester Review and Test**

- Semester Review
- Semester Test