



Geometry Course Description

Chapter 1: Foundations for Geometry

This chapter will introduce students to the key terms and concepts in geometry. Students will learn how to write the notation for various geometric expressions like angles, lines, rays, planes, points and segments. Lastly, the concept of theorems and postulates are introduced and their importance explained.

Sections:

- Welcome to geometry
- Points, lines and planes
- Line segments, rays
- Angles
- Theorems and postulates
- Algebra review

Chapter 2: Reasoning and Proof

In this chapter students will study the role of logic and proof in geometry. Students will learn how to identify the hypothesis and conclusion in conditional statements and write the converse. In addition, students will learn more about the properties of lines and angles. Lastly, student will learn the structure of a geometric proof and study the steps to write an entire proof on their own.

Sections:

- Conditional statements and converses
- Algebra properties
- Deductive and inductive reasoning
- More on angles and lines
- How to plan and write a proof
- Algebra review

Chapter 3: Perpendicular and Parallel Lines, Polygons

In this chapter students will study the relationships of perpendicular and parallel lines. Several important properties will be covered essential to solve common problems in geometry. A critical section in this chapter is dedicated to theorems that state when two or more lines are parallel. Students are also introduced to polygons and their types.

Sections:

- Parallel lines and transversals
- Properties of parallel and perpendicular lines
- Proving lines parallel
- Introduction to polygons
- Algebra Review



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Chapter 4: Congruent Triangles

Congruency is a core concept in geometry. Students will learn the concept of congruency by studying the properties of congruent triangles. After an introduction to congruent figures students will focus on learning to prove triangles are congruent using the SSS, SAS, ASA, AAS and HL Theorems.

Sections:

- Congruent figures
- Proving congruent triangles: Side-Side-Side and Side-Angle-Side Theorem
- Proving congruent triangles: Angle-Side-Angle and Angle-Angle-Side Theorem
- Proving congruent triangles: Hypotenuse-Leg Theorem
- Algebra review

Chapter 5: Properties of Triangles

In this chapter students will learn the various properties of triangles. Several definitions and theorems will be introduced about the medians, altitudes and bisectors of triangles. In addition the chapter has an important section on the inequalities found in triangles between sides and angles.

Sections:

- Medians, altitudes and bisectors
- Bisector theorems
- Triangle inequalities
- Algebra review

Chapter 6: Quadrilaterals

In this chapter students will learn the various properties and type of quadrilaterals. The first two sections focus on the properties of parallelograms to include proving a quadrilateral is a parallelogram. Next additional sections look in-depth at trapezoids, special quadrilaterals to include the rhombus and theorems involving midpoints in quadrilaterals and triangles.

Sections:

- Parallelograms
- Proving quadrilaterals are parallelograms
- Trapezoids
- Special quadrilaterals
- Quadrilaterals, triangles and midpoints
- Algebra review



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Chapter 7: Similarity

Similarity is a core geometric relationship. To solve most similar polygon problems students need to have the algebra skills to solve ratios and proportions, hence this is the first section in the chapter. The remaining sections focus on similar polygon problem solving and the properties and theorems of similar triangles.

Sections:

- Ratios and proportions
- Similar polygons
- Similar triangles
- Algebra review

Chapter 8: Transformations

In this chapter students will learn to apply transformations to images. Sections in the chapter focus on the transformations of reflections, rotations, dilations, translations and glide reflections. An emphasis is placed on developing the skills to construct the graphs of transformations found in common geometry problems.

Sections:

- Reflections
- Rotations and dilations
- Translations and glide reflections
- Algebra review

Chapter 9: Right Triangles and Trigonometry

In this chapter students will learn a wide array of concepts about right triangles. Sections in the chapter look at similar right triangles, the Pythagorean Theorem and special right triangles. For most students the section on trigonometry will be their first introduction to the topic. The chapter ends on a section that applies right triangle trigonometry to solving word problems.

Sections:

- Similar right triangles
- The Pythagorean theorem
- Special right triangles
- Trigonometric ratios
- Right triangle word problems
- Algebra review



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Chapter 10: Circles

In this chapter students will learn the important properties and relationships found in circles. First, students will learn the parts of a circle and understand the properties of a tangent line. Additional sections will explore key theorems about arcs, chords and inscribed circles. Lastly, the chapter looks at other angle and segment relationships found in circles.

Sections:

- Introduction to circles and tangents
- Arcs and chords
- Inscribed circles
- Other angle relationships in circles
- Segment lengths and circles
- Algebra review

Chapter 11: Area and Volume

In this chapter students will learn how to find the area, surface area and volume of various geometric figures. Sections will explain the formulas to find area, surface area and volume of figures to include cubes, circles, cylinders, prisms, pyramids and others shapes. An entire section explains how to find the area of regular polygons. Lastly, students will learn how to find the area of sectors and arc lengths found in circles.

Sections:

- Area of basic figures
- Surface area of basic figures
- Volume of basic figures
- Area of regular polygons
- Area of circles/sectors and arc length
- Algebra review