

Course Description:

In Geometry (1 of 2), students will build upon their understanding of geometric concepts by working through a variety of geometric problems, writing formal proofs, and constructing geometric figures. Transformations are used to explain the concepts of congruent and similar figures with a focus on the properties of congruent and similar triangles. These properties are proven as students become familiar with postulates, theorems, and formal proofs. The course wraps up with trigonometric ratios and their applications to real-world situations.

Course Objectives:

- Demonstrate understanding of geometric terms.
- Make formal geometric constructions using different tools and methods.
- Create constructions of geometric figures.
- Prove theorems about geometric figures.
- Solve problems and prove relationships in geometric figures.
- Represent and describe transformations.
- Use rigid motions to prove that triangles are congruent.
- Use transformations to determine whether two figures are similar.
- Explain and use trigonometric ratios and the Pythagorean Theorem.

Required Materials:

In course.

Course Overview:

Unit 1 Overview

In this unit, students will focus on the introductory concepts of geometry. They will use basic concepts such as points, lines, and distance to develop formal definitions. They will also complete introductory constructions and two-column proofs.

Unit 2 Overview

In this unit, the students will relate rigid transformations and symmetry to congruence and apply these concepts to verify triangle congruence with side-side-side, side-angle-side, and angle-side-angle congruence. The students will also learn to use these theorems and postulates to write proofs and solve problems. They will also learn how to construct angle bisectors.

Unit 3 Overview

In this unit, the students will focus on proving and using theorems related to angles and relationships with parallel lines, perpendicular lines, and lines and segments in triangles. They will learn how to use these theorems to write proofs and solve problems. Students will also learn how to construct parallel lines and perpendicular bisectors.

Unit 4 Overview

In this unit, the students will learn two additional ways to prove triangles congruent and apply triangle congruence to identify and prove properties of parallelograms. The students will also use properties of basic and special parallelograms to writing proofs and solving problems. They will also learn how to construct a line perpendicular to a given line through a point that is on the given line and a point that is not on the given line.

Unit 5 Overview

In this unit, the students will explore dilations and their relationship to similarity. They will also learn how to prove that two triangles are similar and use similarity to find measurements and write proofs.

Unit 6 Overview

In this unit, students will use their knowledge of similar triangles to prove the Pythagorean Theorem and define the trigonometric ratios sine, cosine, and tangent. They will then use the Pythagorean Theorem, the trigonometric ratios, and the inverse relationships of the trigonometric ratios to solve problems.