Exploring Triangles

Why are we studying this?

By studying the properties, theorems and formulas used when working with triangles, and other geometric figures students will be able to solve relational problems in the world around them, such as the distance between two locations.

Occupations that use the geometry of triangles include:

- Landscapers
- Carpenters
- Computer Science Engineers
- Cartographers
- Surveyors
- Architects
- Engineers

Students will also be introduced to similar triangles on the coordinate plane, a topic that will be extended in high school to prove The Pythagorean Theorem as well as other topics involving coordinate geometry.

The performances of a high school drill team are popular during half-time shows at school football and basketball games.

At one particular show, the drill team decided to make the pattern below holding long ribbons that will go from one girl in the middle, G, to six other girls on the field. The girls are unsure of how long to make the ribbons and some think that the ribbon to the girl at point C will be shorter than to the girl at point B. If each unit on the grid is 1 foot, how long should the ribbons be? Are they different lengths? (Adapted from MVP)
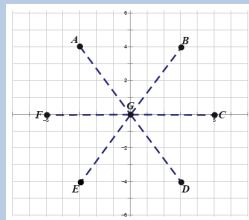
Math Topics Addressed in this Unit:

- Sum of the Angles of a Triangle
- Exterior Angles of a Triangle
- Pythagorean Theorem Proof, Application and Converse
- Using the Pythagorean Theorem to Find Distance on a Coordinate Plane
- Informal Relations When a Transversal Cuts a Set of Parallel Lines
- AA Triangle Similarity

Dear Student & Parent/Guardian,

This unit looks at angle relationships learned in 7th grade and the relationship between the lengths of the sides of a right triangle known as The Pythagorean Theorem. Students will devleop a conceptual understanding of The Pythagorean Theorem by going outside and "walking" right triangles of different size, counting the number of steps and looking for patterns to determine a relationship between the side lengths. Students will also informally explore one or more proofs of The Pythagorean Theorem, of which there are over 300 variations!

Students will conceptually explore the relationship between the interior and exterior angles of a triangle and use these relationships to solve problems. Finally, students will apply The Pythagorean Theorem to find the distance between two points on a coordinate plane.

-AUHSD Math Teachers

Sample questions we will be able to answer:

50 ft   60 ft   h   35 ft
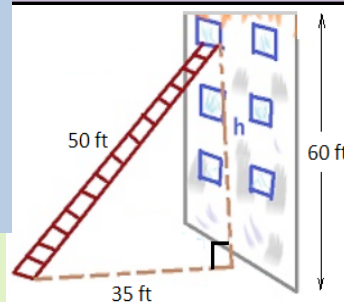
How far up the wall does the ladder reach?

What is the relationship between angles:
1, 2, and 3?

1, 2, and 4?

3, 4, and 5?