Geometry Concepts and Connections Unit 4: Investigating Similarity

Overview:

In this unit, students will explore nonrigid transformations and proportional reasoning to develop a formal understanding of similarity. Students will use the definition of dilation to describe similarity and the criterion for triangles to be similar. Similarity transformations (rigid motions followed by dilations) define similarity in the same way that rigid motions define congruence. These transformations lead to the criterion for triangle similarity that two pairs of corresponding angles are congruent. Students will use this to prove similarity involving triangles. This unit involves similarity and proofs. Students will understand similarity in terms of similarity transformations, use the properties of similarity transformations to solve problems and prove two triangles are similar, and prove theorems involving similarity.

Learning Targets

In Unit 4, students will:

- Identify dilation as reduction or enlargement depending on the scale factor.
- Draw a dilated image given the center at the origin and scale factor.
- Describe a dilation by identifying its center and finding the scale factor.
- Find the scale factor by using the ratio of sides of the image to preimage.
- Understand and use function notation to represent dilations in the coordinate plane.
- Describe the properties of dilations, such as center, scale factor, angle measure, parallelism, and collinearity.
- Apply the definition of similarity to determine if two figures are similar.
- Prove two triangles are similar by using AA, SSS, and SAS using logic statements, paragraph proofs, two-column proofs, or flowchart proofs.
- Apply properties of similarity to solve problems with missing values involving corresponding parts.
- Apply the Midsegment and Angle Bisector Theorems to solve problems in similar figures.
- Prove a line parallel to one side of a triangle divides the other two proportionally, and its converse.
- Prove the Pythagorean Theorem using triangle similarity.

Key Vocabulary: (linked to GA DOE Interactive Glossary)

Angle Bisector	Function Notation	Pythagorean Theorem	Similarity
Center of Dilation	Midsegment	Rigid Motion	Similarity Transformation
Congruence	Proof	Scale Factor	Theorem
Dilation	Proportionality	Similar	Transformation

Supporting Resources:

http://ctlslearn.cobbk12.org/
Similar (mathsisfun.com)

https://gavirtual.instructure.com/courses/34328

What is a Dilation? | Virtual Nerd

Intro to triangle similarity (video) | Khan Academy