

Congruence and Similarity

Family Letter

Dear Family,

In this module, *Congruence and Similarity*, students will draw on their knowledge of transformations to understand congruence, similarity, and **corresponding parts**. They will recognize that if a figure can be obtained by a series of transformations applied to another figure, the two figures are **similar** (same shape), and if the transformations do not include a dilation, the two figures are **congruent** (same size and shape). They will apply this understanding to find missing sides and angles of similar and congruent figures.

What Did Students Learn Previously?

In a previous module, students investigated translations, reflections, rotations and dilations by graphing them and analyzing the coordinates of their images. For example, students learned that, if a figure is reflected across the y -axis, the x -coordinate in each vertex takes on the opposite sign. Therefore, the reflection of a triangle with preimage coordinates $A(1, 3)$, $B(3, 8)$, $C(5, -1)$ will have coordinates $A'(-1, 3)$, $B'(-3, 8)$, $C'(-5, -1)$.

What Will Students Learn in This Module?

Congruence

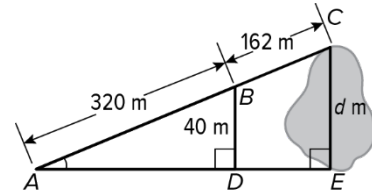
- Students will determine if two figures are congruent by identifying a sequence of rotations, reflections, and translations that maps one figure onto the other.
- Students will identify corresponding parts of congruent figures and write congruency statements.
- Students will solve for missing sides and angles of congruent figures.

Similarity

- Students will determine if two figures are similar by identifying a sequence of transformations and dilations that maps one figure onto the other.
- Students will determine whether a dilation occurred by verifying that corresponding parts are proportional.
- Students will determine whether two triangles are congruent using Angle-Angle Similarity (if two angles in a triangle are congruent, the triangles are similar).
- Students will identify the scale factor of similar figures and use it to find missing side lengths.

Indirect Measurement

- Students will use similar triangles to solve problems involving indirect measures. For example, the distance across a lake can be estimated by creating similar triangles as shown in the figure. The distance can then be found by writing the proportion $\frac{d}{(320+162)} = \frac{40}{320}$ and solving for d .



What Vocabulary Terms Will Students Use?

Term	Definition
Angle-Angle Similarity	A rule used to verify that two triangles are similar which states: if two angles in one triangle are congruent to two angles in another triangle, then the triangles are similar.
congruent	Having the same measure. If two figures are congruent, one figure can be obtained from the other by a series of translations, reflections, and/or rotations.
corresponding parts	Parts of congruent or similar figures that are in the same relative position.
indirect measurement	A technique using similar triangles that is used to find distances or lengths which are difficult to measure directly.
similar	Having the same shape, but not necessarily the same size. If two figures are similar, one image can be obtained from the other by a sequence of transformations and dilations.

How You Can Provide Support

- Support your child's understanding of congruence and similarity by pointing out geometric patterns that you observe on fabrics, floor coverings, architecture, and art.
 - Discuss:* Ask your child to identify similar and/or congruent shapes in a pattern and have them describe a series of transformations that could be used to support their conclusion. Point to an angle in the pattern and ask your child to identify corresponding angles in similar or congruent figures in the pattern.
 - Create:* Have your child create a pattern using both similar and congruent shapes. Ask your child how they created their pattern. If they did not use transformations, ask them how they *could* have used transformations to create their pattern.
- Encourage your child to have a positive, growth-oriented attitude towards mathematics and their learning.
 - Encourage them to ask questions – both at home and in class. Sometimes, an answer to a question will generate more questions. That's how you know they are learning!
 - Encourage your child to embrace challenges and remind them that every challenge is an opportunity to learn something new.

- Celebrate successes – both small and large.
3. Contact me to arrange a time to discuss the specifics of your child’s performance and how we can work together to help them succeed in this module.

Sincerely,

(Teacher’s Name)

(Email/Phone)