Module 1: Transforming Geometric Objects

TOPIC 1: RIGID MOTION TRANSFORMATIONS

In this topic, students use patty paper (thin, transparent paper) and the coordinate plane to investigate congruent figures. Throughout the topic, students are expected to make and investigate conjectures, and justify true results about transformations. They learn that transformations are mappings of a plane and all the points of a figure on a plane according to a common action or operation. They also learn that rigid motions preserve the size and shape of a figure, but that reflections change the orientation of the vertices of a figure. Note: If students do not have access to patty paper, they can use parchment paper, tracing paper, or even white paper.

Where have we been?

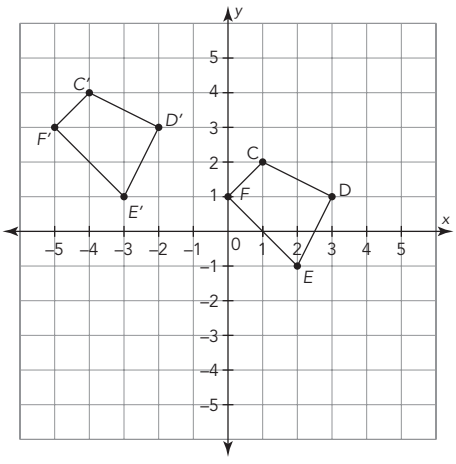
Students review using patty paper to compare figures in a coordinate plane. They review how to compare side lengths and angle measures and how to locate the midpoint of a segment using patty paper. They sort figures according to shape and then according to size and shape. They use patty paper and informal transformation language to verify their sorts.

Where are we going?

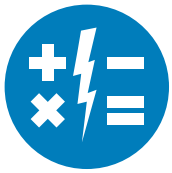
This topic begins the study of congruence and sets the stage for similarity. In high school, students will continue to formalize their knowledge of congruent triangles and use congruence to prove a wide variety of geometric theorems and justify constructions.

Verifying Congruence Using Translations

A translation "slides" a geometric figure in some direction. Translations can be used to verify that two figures are congruent. For example, Quadrilateral *CDEF* can be translated up 2 units and left 5 units. This will show that it is congruent to Quadrilateral *C'D'E'F'*.



Myth: "I don't have the math gene."



Let's be clear about something. There isn't ***a*** gene that controls the development of mathematical thinking. Instead, there are probably ***hundreds*** of genes that contribute to our ability to reason mathematically. Moreover, a recent study suggests that mathematical thinking arises from the ability to learn a language. Given the right input from the environment, children learn to speak without any formal instruction. They can use number sense and pattern recognition the same way.

To further nurture your child's mathematical growth, attend to the learning environment. You can think of it as providing a nutritious mathematical diet that includes: discussing math in the real world, offering the right kind of encouragement, being available to answer questions, allowing your student to struggle with difficult concepts, and giving them space for plenty of practice.

#mathmythbusted

Talking Points

You can further support your student's learning by asking questions about the work they do in class or at home. Your student is becoming familiar with movements (called transformations) of geometric figures and reasoning about these movements.

Questions to Ask

- How does this problem look like something you did in class?
- Can you show me the strategy you used to solve this problem? Do you know another way to solve it?
- Does your answer make sense? How do you know?
- Is there anything you don't understand? How can you use today's lesson to help?

Key Terms

corresponding sides

Corresponding sides are sides that have the same relative position in geometric figures.

transformation

A transformation is the movement of a plane and all the points of a figure on a plane according to a common action or operation.

pre-image

The original figure in a transformation is called the pre-image.

image

The new figure created from a transformation is called the image.