Congruency

Lesson Overview

In this lesson, students will work in groups to make predictions about the relationship between congruency and transformations and to prove congruency through a sequence of transformations.

Standards Addressed

CCSS   8.G.2   Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits congruent between them.

Disciplinary Literacy Best Practices

Chum Check/Partner Dialogue
Bounce Cards
Give Me Five
Exit Ticket

Lesson Plan

Time Required – One 60 minute classes

Disciplinary Vocabulary – transformation, translation, reflection, rotation, congruent

Materials Needed:

- Bounce Cards
- Coordinate Grid with Two Congruent Shapes
- Pieces of Transparency
- Markers (for use on transparency, such as Sharpie)
- Index Cards

Assessment: Student dialogue, Exit Ticket

Engage

- o "Yesterday, we learned about three different types of transformations. Take a moment for a Chum Check with your neighbor to review the definitions of the <u>transformations</u> we learned yesterday (translation, reflection, rotation)."
- o Students review notes and definitions with their partners, reviewing their work from the day before.
- o "What questions do you have about the work we did yesterday?"
- o Consider the following two triangles. Discuss the question with your partner.
- o What <u>transformation</u>, or sequence of transformations would map one triangle onto the other?
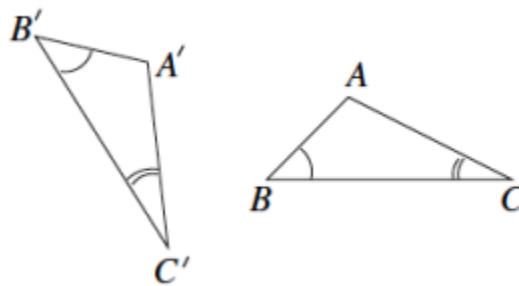
- o After pairs discuss, ask for students to share their thinking with the class.
- o Use your bounce cards to support your dialogue as you discuss the following question with your group: "What predictions might you make about the relationship between transformations and shapes that are congruent?"
- o Give Me Five: Teacher asks for five predictions about the relationship between transformations and shapes that are congruent. Teacher records predictions on the board or on a chart.

Explore

- o "What does it mean to be congruent?"   (Allow students answers. They may have a "same shape, same size" definition from earlier grades.)
- o "Are these two shapes congruent?" Show the coordinate grid with two shapes that are congruent. "How do you know?"
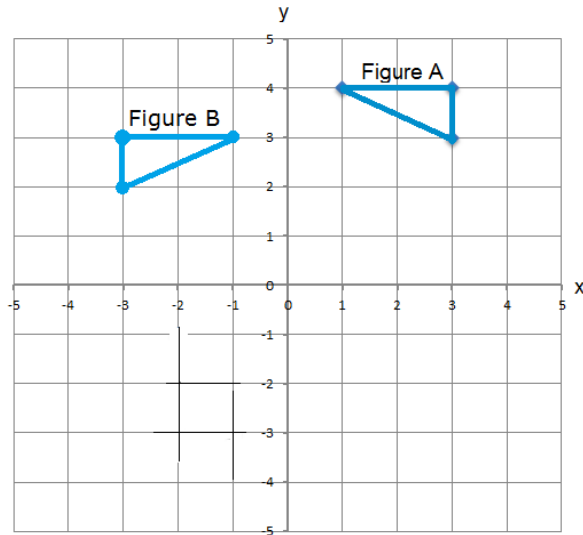
- o "Your group's task is to prove to me that these two shapes are congruent. You will have a copy of this coordinate grid, a piece of transparency paper, and a marker to use in your proof."
- o Students should use the transparency to show the series of transformations needed to map one shape onto the other to prove congruency.
- o Facilitate partner dialogue and assist as needed with student proofs. Ask why and justify!

Explain

- o Student groups share their results with the class. Students should continue to employ the bounce cards to support their mathematical discussion with one another.
- o Teacher provides definition of congruent:
  - o **Congruent**. Two plane or solid figures are congruent if one can be obtained from the other by rigid motion (a sequence of rotations, reflections, and translations).
- o Question for Class Discussion: "Why might it be important to define congruent using transformations instead of our previous definition (same shape, same size)? How are the two definitions the same? How are the two definitions different?

Exit Ticket: In your own words, write a definition of congruent based on your learning today.

Teacher Biographical Information

Lesson Author:

Terrie Dew is an educational specialist with the S2TEM Centers SC. She has nineteen years' experience as a STEM educator working with both students and adults.