## Lesson 11: What Is the Same?

Let’s decide whether shapes are the same.

### 11.1: Find the Right Hands

A person’s hands are mirror images of each other. In the diagram, a left hand is labeled. Shade all of the right hands.



### 11.2: Are They the Same?

For each pair of shapes, decide whether or not they are the same.



### 11.3: Area, Perimeter, and Congruence



1. Which of these rectangles have the same area as Rectangle R but different perimeter?
2. Which rectangles have the same perimeter as Rectangle R but different area?
3. Which have the same area *and* the same perimeter as Rectangle R?
4. Use materials from the geometry tool kit to decide which rectangles are **congruent**. Shade congruent rectangles with the same color.

#### Are you ready for more?

In square $ABCD$, points $E$, $F$, $G$, and $H$ are midpoints of their respective sides. What fraction of square $ABCD$ is shaded? Explain your reasoning.



### Lesson 11 Summary

**Congruent** is a new term for an idea we have already been using. We say that two figures are congruent if one can be lined up exactly with the other by a sequence of rigid transformations. For example, triangle $EFD$ is congruent to triangle $ABC$ because they can be matched up by reflecting triangle $ABC$ across $AC$ followed by the translation shown by the arrow. Notice that all corresponding angles and side lengths are equal.



Here are some other facts about congruent figures:

* We don’t need to check all the measurements to prove two figures are congruent; we just have to find a sequence of rigid transformations that match up the figures.
* A figure that looks like a mirror image of another figure can be congruent to it. This means there must be a reflection in the sequence of transformations that matches up the figures.
* Since two congruent polygons have the same area and the same perimeter, one way to show that two polygons are *not* congruent is to show that they have a different perimeter or area.



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