

## Similarity

**STRAND: Measurement and Geometry**

**STRAND CONCEPT: Congruence and Similarity**

**SOL 6.9, 7.5**

### ***Remediation Plan Summary***

Students sort a set of rectangles into three groups and determine the similarity relationships.

### ***Common Misconceptions***

- Students may incorrectly think that figures are not similar because they have been rotated or are not shown in the same orientation.
- Students may incorrectly think that congruent figures are not also similar.

### ***Materials***

- Sets of rectangles
- Alphabet Similarity worksheets
- Similar Figures Recording Sheet
- Graph paper
- Reflecting on Similar Figure handout

### ***Introductory Activity***

Review the meaning of the word *congruent*—having exactly the same size and shape. Illustrate the definition by writing two congruent capital *Qs* on the board. Then, write a large *Q* and a smaller-size *Q*. Explain to the students that the *Qs* in this second pair are *similar* but noncongruent. Once students can give you other examples of similar letters, pictures, etc., have them complete the “Alphabet Similarity” worksheet. Discuss the answers before going on to the lesson.

### ***Plan for Instruction***

1. In advance of the lesson, make a set of 14 rectangles for each pair of students. Cut them from grid paper in the following sizes: 1 x 1, 1 x 2, 1 x 4, 2 x 4, 2 x 8, 3 x 3, 3 x 6, 3 x 12, 4 x 8, 4 x 16, 5 x 5, 5 x 10, 7 x 7, 10 x 10. Draw all diagonals on the rectangles before photocopying them and cutting them out.
2. Distribute the sets of rectangles. Have student pairs divide the rectangles into three groups with the members of each group having the same shape but differing in size. Students should find that one group consists of five squares of different sizes (1 x 1, 3 x 3, 5 x 5, 7 x 7, and 10 x 10). Another group consists of the 1 x 2, 2 x 4, 3 x 6, 4 x 8, and 5 x 10 rectangles. The third group consists of the 1 x 4, 2 x 8, 3 x 12, and 4 x 16 rectangles.
3. Once students grouped the rectangles, have them arrange each group from smallest to largest and look at the relationships among members of the same group. Suggest to students that they stack the members of each group on top of each other, starting with the largest. This will allow them to line up the diagonals.

## AR Remediation Plan- Congruence and Similarity

4. Once students have them arranged, lead a class discussion based on the following questions. *What patterns do you see within each family?* (Have them focus on length and width.) *What do you notice about the diagonals in each group of rectangles? How could you determine another member of the group?*
5. Have students complete the recording sheet with the information from the rectangles in each group.
6. Discuss the following questions. *Within a group, what patterns do you notice going down the chart? Within a group, what patterns do you notice going across, from width to length?*
7. Have students create ratios of width to length for each group. Ask them what they notice about each of the fractions in each set. (They are equivalent.)
8. Based on this discussion, have students define *similar figures*.
9. To extend this activity, have students graph the data by graphing the length and width of each rectangle. It works best to use a different color for each set. Students should see that the coordinates associated with a given set form a line.
10. Have students discuss the following questions based on the graphs: *How can you use the graph to find another member of a group? Given a rectangle, how can you tell if it is similar to the ones already graphed?*

### ***Pulling It All Together (Reflection)***

Exit Ticket: Reflect on what you learned today about congruent and similar. Write a note to your parents about what it means for shapes to be similar or congruent.

**Note: The following pages are intended for classroom use for students as a visual aid to learning.**

Virginia Department of Education 2018

Name: \_\_\_\_\_

## **Alphabet Similarity**

Determine whether the pairs of upper and lower case letters are similar or not.

**Aa      Bb      Cc      Dd      Ee**

**Ff      Gg      Hh      Ii      Jj**

**Kk      Ll      Mm      Nn      Oo**

**Pp      Qq      Rr      Ss      Tt**

**Uu      Vv      Ww      Xx      Yy**

**Zz**

Name: \_\_\_\_\_

## Similar Figures Recording Sheet

### GROUP ONE

Rectangle	Width	Length
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

---

### GROUP TWO

Rectangle	Width	Length
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

---

### GROUP THREE

Rectangle	Width	Length
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____