

Inquiry Lab

Similar Figures



WHAT kind of scale factor produces an enlargement or reduction of a drawing?



Content Standards
7.G.1

Mathematical Practices
1, 3, 6, 7



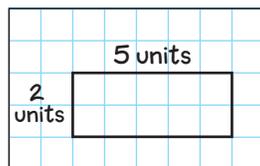
Vocabulary
similar figures

Quilts A quilt maker uses a pattern of rectangles and triangles to make certain types of quilts. How can a quilter reproduce the pattern pieces on a different scale to enlarge or reduce the pattern pieces?

Investigation 1

Step 1

On grid paper, draw a rectangle with a length of 5 units and a width of 2 units. This is the original figure.



Step 2

Use a scale factor of 1.5. Draw a new rectangle with a length that is 1.5×5 units and a width that is 1.5×2 units.

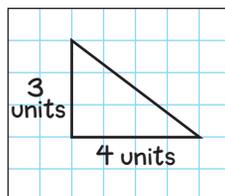
The rectangle you drew in Step 2 is an enlargement of the rectangle you drew in Step 1.



Investigation 2

Step 1

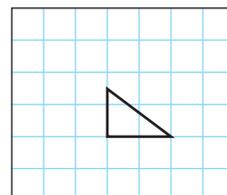
On grid paper, draw a right triangle with legs that measure 3 units and 4 units. This is the original figure.



Step 2

Use a scale factor of $\frac{1}{2}$. Draw a new triangle with legs that measure $\frac{1}{2} \times 3$ units and $\frac{1}{2} \times 4$ units.

The triangle you drew in Step 2 is a reduction of the triangle you drew in Step 1.



When figures have the same shape but not necessarily the same size, they are called **similar figures**.



Collaborate

Work with a partner.

- Draw a 12-unit by 8-unit rectangle on grid paper. This is the original figure. Draw new figures using the scale factors given below.
 - 4
 - 3
 - $\frac{3}{4}$
 - 0.5



Analyze

Refer to Exercise 1.

- Look at the scaled figures you drew. How do the angles appear to compare to the angles in the original figure?
- Look at the scaled figures you drew. How do the lengths of the sides of the figures compare to the original figure?
- Find the area of the original figure.
- Copy and complete the table for the scale drawings.

Scale Drawing	Scale Factor	Area of Scale Drawing	$\frac{\text{Area of Scale Drawing}}{\text{Area of Original Figure}}$
a.	4		
b.	3		
c.	$\frac{3}{4}$		
d.	0.5		

- How does the ratio $\frac{\text{area of scale drawing}}{\text{area of original figure}}$ compare to the scale factor?
- CCSS Make a Conjecture** Refer to Exercise 6. How could you find the area of a scale drawing if you know the area of the original figure and the scale factor?
- CCSS Be Precise** Suppose you draw a 12-inch square. If you draw a scale drawing of this square with a scale factor of $\frac{2}{3}$, what is the length of the sides of the scale drawing? Would the scale drawing be an enlargement or reduction of the original figure?
- CCSS Make a Conjecture** Repeat Investigations 1 and 2 using different original figures and different scale factors. How can you change the scale factor you originally used in Investigation 1 to produce an even larger figure? How can you change the scale factor you used in Investigation 2 to produce an even smaller figure?



Reflect

- Inquiry** WHAT kind of scale factor produces an enlargement or reduction of a drawing?