

NAME \_\_\_\_\_

Module 9 Characteristics of Geometric Shapes  
Lesson 4 Similar Polygons

### Lesson Objectives

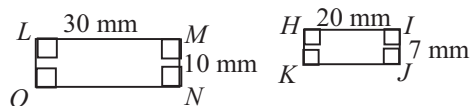
- Identify shapes that have similarity.
- Identify similar figures and explore their properties.
- Develop the properties of similar figures (ratio of sides and congruent angles).
- Apply proportional reasoning to solve problems involving congruent or similar shapes (e.g., create scale drawings).

### Subtopic 1 Similar Polygons

Similar Polygons

- Same shape
- Not necessarily the same size
- Congruent corresponding angles
- Proportional corresponding sides

- 1** Is rectangle  $LMNO$  similar to rectangle  $HIJK$ ?  
Explain why or why not.



$$\frac{MN}{IJ} \stackrel{?}{=} \frac{LM}{HI}$$

$$\frac{10}{7} \stackrel{?}{=} \frac{30}{20}$$

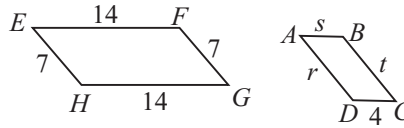
$$10 \times 20 \stackrel{?}{=} 7 \times 30$$

$$200 \neq 210$$

**No: The sides are not in proportion.**

### Subtopic 2 Finding Unknown Lengths

- 2 Find each unknown length in the similar parallelograms.



$$\overline{AB} \cong \overline{DC}, \text{ so } s = 4.$$

$$\frac{EF}{CB} = \frac{EH}{CD}$$

$$\frac{14}{t} = \frac{7}{4}$$

$$7t = 14 \times 4$$

$$7t = 56$$

$$t = 8$$

$$\overline{AD} \cong \overline{BC}, \text{ so } r = 8.$$

### Subtopic 3 Enlargements and Reductions

Scale Factor

The ratio of two corresponding lengths in similar geometric figures

- 3 Find the 50% reduction of Luria's 4 in. by 6 in. photo by using a percent proportion.

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$

$$\frac{\text{part}}{\text{whole}} = \frac{50}{100}$$

$$\frac{h}{4} = \frac{50}{100}$$

$$\frac{h}{4} = \frac{1}{2}$$

$$\frac{2}{4} = \frac{1 \times 2}{2 \times 2}$$

$$h = 2 \text{ inches}$$

$$\frac{l}{6} = \frac{50}{100}$$

$$\frac{l}{6} = \frac{1}{2}$$

$$\frac{3}{6} = \frac{1 \times 3}{2 \times 3}$$

$$l = 3 \text{ inches}$$

The 50% copy is 2 in. by 3 in.

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**Module 9**    **Characteristics of Geometric Shapes**  
**Lesson 4**    **Similar Polygons**

- 4** An 8 in. by 10 in. photo is enlarged by 700%. What are the dimensions of the enlargement?

$$\begin{aligned} &700\% \times \text{original} \\ &\text{Scale Factor: } 7 \\ &7 \times (8 \text{ in. by } 10 \text{ in.}) \\ &56 \text{ in. by } 70 \text{ in.} \end{aligned}$$

The 700% enlargement dimensions are 56 in. by 70 in.

**Subtopic 4**    **Scale Drawings**

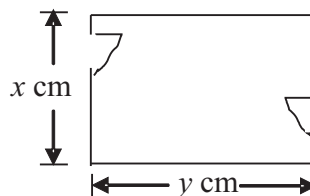
Scale Drawing

A drawing that is a reduction or enlargement of an actual object

Scale

The ratio between the measure on a drawing and the actual measurement

- 5** A 4 m by 6 m family room is being drawn on a blueprint with a scale of 1 cm = 2 m. What are the dimensions in the blueprint?



$$\begin{aligned} \frac{\text{drawing (cm)} \rightarrow}{\text{actual (m)} \rightarrow} & \frac{1}{2} = \frac{x}{4} \\ 2x &= 1 \times 4 \\ 2x &= 4 \\ \frac{2x}{2} &= \frac{4}{2} \\ x &= 2 \end{aligned}$$

$$\begin{aligned} \frac{\text{drawing (cm)} \rightarrow}{\text{actual (m)} \rightarrow} & \frac{1}{2} = \frac{y}{6} \\ 2y &= 1 \times 6 \\ 2y &= 6 \\ \frac{2y}{2} &= \frac{6}{2} \\ y &= 3 \end{aligned}$$

The dimensions on the blueprint are 2 cm by 3 cm.

