NAME _____ DATE _____ PERIOD ____

10-3 Study Guide and Intervention

Scale Drawings and Models

Scale drawings and **scale models** are used to represent objects that are too large or too small to be drawn or built at actual size. The **scale** gives the ratio that compares the measurements on the drawing or model to the measurements of the real object. The measurements on a drawing or model are proportional to the measurements of the actual object.

EXAMPLE 1 RACE CARS **A model of a race car has a width of 3.5 inches. The scale is 1 inch = 2 feet. Find the actual width of the race car.**

Let w represent the actual width.

Scale		Race Car
model width →	$\frac{1}{2} = \frac{3.5}{w}$	← model width
actual width →		← actual width

$1 \times w = 2 \times 3.5$ Find the cross products.

$w = 7$ Multiply.

The actual width of the race car is 7 feet.

EXAMPLE 2 HIKING **On a map, the distance between Round Lake and June Lake is 6 inches. The scale on the map is 3 inches = 5 miles. Find the actual distance between the two lakes.**

Let d represent the actual distance.

Map Scale		Actual Distance
map distance →	$\frac{3}{5} = \frac{6}{d}$	← map distance
actual distance →		← actual distance

$3 \times d = 5 \times 6$ Find the cross products.

$3d = 30$ Multiply.

$\frac{3d}{3} = \frac{30}{3}$ Divide.

$d = 10$

The distance between the two lakes is 10 miles.

EXERCISES

DRAFTING **For Exercises 1–4, use the following information.**

On a set of drawings, the scale is 2 inch = 4 feet. Find the actual measurements.

	Object	Drawing	Actual Size
1.	door	4 inches	
2.	wall	6 inches	
3.	tree	12 inches	
4.	computer	1 inch	

5. MAPS A map has a scale of 2 inches = 7 miles. The distance between Pirate's Cove and Midnight Lagoon on the map is 12 inches. What is the actual distance between the two places?

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Practice: Word Problems

Scale Drawings and Models

1. **MAPS** On a map with a scale of 1 inch = 9 miles, the distance between two towns is 3 inches. What is the actual distance between the two towns?	2. **BLUEPRINTS** On an architect's blueprint, the front of a building measures 27 inches. The scale of the blueprint is 1 inch = 2 feet. How wide will the front of the actual building be?
3. **MODELS** The model of an airplane has a wingspan of 20 inches. The model has a scale of 1 inch = 4 feet. What is the wingspan of the actual airplane?	4. **ARCHITECTURE** The drawing for a building has a scale of 1 inch = 3 feet. The building in the drawing has a height of 14 inches. How tall will the actual building be?
5. **ROCKETS** A model of the Saturn V rocket has a scale of 1 inch = 12 feet. If the model rocket is 30 inches tall, how tall was the actual Saturn V rocket?	6. **CARS** Ron took a photograph of his car and then measured the length of the car in the photograph. The length was $4\frac{1}{2}$ inches. If the scale of the photograph is 1 inch = 4 feet, how long is Ron's actual car?
7. **MODELS** A model of a 4-cylinder gasoline engine is built on a scale of 1 inch = 6 inches. If the length of the model engine is 9 inches, how long is the actual engine?	8. **PHOTOGRAPHY** A photo lab technician is going to reduce a photograph that is 9 inches wide using a scale of 1 inch = $\frac{2}{3}$ inch. How wide will the reduced photo be?

Lesson 10–3