LESSON 4.5b

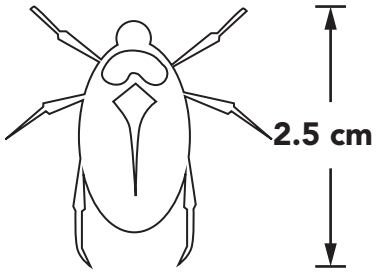
Pound for Pound, Inch for Inch

7.G.1

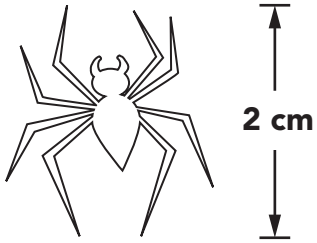
Objective: Scale and Scale Drawings

Warm-Up

Calculate the given scales for each bug



Scale: 0.75 cm = 3 mm



Scale: 0.5 cm = 2 mm

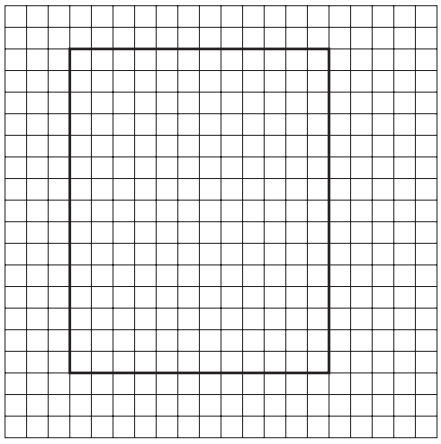
EXPLORE 2

Creating Scale Drawings

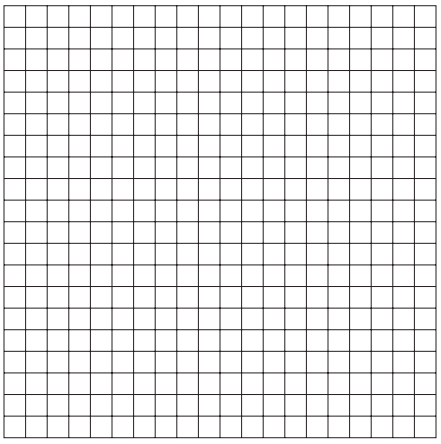
In this activity you will reproduce two different scale drawings at a different scale.

1. The rectangle shown is drawn at a scale of 1 in. : 2 ft.

1 in. : 2ft



1 in. : 3ft



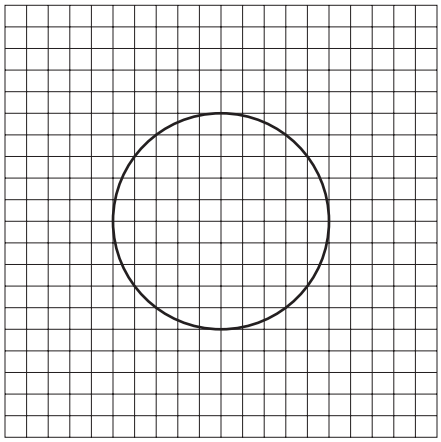
a. Draw the rectangle using a scale of 1 in. : 3 ft.
Explain your solution.

b. Did you enlarge the rectangle or reduce the rectangle?

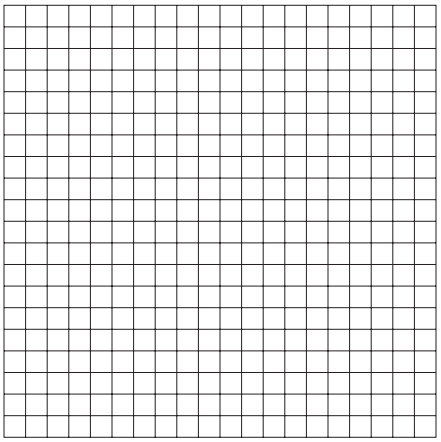
c. Show how to calculate the actual dimensions of the rectangle using each scale.

2. The circle shown is drawn at a scale of 2 cm : 3 mi.

2 cm : 3 mi



4 cm : 5 mi



a. Draw the circle using a scale of 4 cm : 5 mi.
Explain your solution.

b. Did you enlarge the circle or reduce the circle?

c. Show how to calculate the actual diameter of the circle using each scale.

EXPLORE 3

Similar Figures

Figures that are proportional in size, or that have proportional dimensions, are called **similar figures**.

When Timmons Photo Company prints photo packages, they include several sizes of photos that are all mathematically similar. The largest size is 12 in. x 16 in. This is read as "12 inches by 16 inches." The first measure is the width of the photo, and the second measure is the height of the photo.

Fran and Joe determined the width of a mathematically similar photo that has a height of 8 inches.

Fran

To determine the unknown width of the smaller photo, I wrote ratios using the measurements from within each photo. The ratio on the left contains the measurements of the large photo. The ratio on the right contains the measurements of the smaller photo.

$$\frac{\text{width of larger photo}}{\text{height of larger photo}} = \frac{\text{width of smaller photo}}{\text{height of smaller photo}}$$

$$\frac{12 \text{ inches}}{16 \text{ inches}} = \frac{x \text{ inches}}{8 \text{ inches}}$$

$$(12)(8) = (16)(x)$$

$$96 = 16x$$

$$6 = x$$

I calculated that the width of the smaller photo is 6 inches.

Joe

To determine the unknown width of the smaller photo, I wrote ratios using the measurements between the two photos. The ratio on the left contains the width measurements of both photos. The ratio on the right contains the height measurements of both photos.

$$\frac{\text{width of larger photo}}{\text{width of smaller photo}} = \frac{\text{height of larger photo}}{\text{height of smaller photo}}$$

$$\frac{12 \text{ inches}}{x \text{ inches}} = \frac{16 \text{ inches}}{8 \text{ inches}}$$

$$(12)(8) = (x)(16)$$

$$96 = 16x$$

$$6 = x$$

I calculated that the width of the smaller photo is 6 inches.

1. What is similar about the two solution methods? What is different about the two solution methods?

2. Determine other possible photo sizes that are mathematically similar.

a. 2 in. × _____

b. 3 in. × _____

c. _____ × 2 in.

d. 4 in. × _____

e. _____ × 3.5 in.

Name: _____ Date: _____ Class: _____

Homework HW

LESSON 4.5b
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Objective

Scale and Scale Drawings

1. Brent and Margaret are planning a trip to the city of Chicago. The map shown includes several destinations they would like to visit while they are there. A scale is included on the map.

a. According to the map, which is longer, a meter or a foot? How can you tell?
b. By following the shortest route along the roads, determine the distance from the Civic Opera House to the Chicago Temple. Write your answer in meters and in feet.
c. Use the distances you approximated from the Opera House to the Temple to determine the approximate number of feet that are in one meter. Explain your answer