Name _____   Date _____

1. Solve for the unknown. Rewrite each phrase as a multiplication sentence. Circle the scaling factor and put a box around the number of meters.
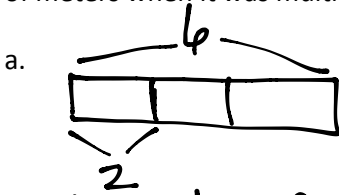
   a. $\frac{1}{3}$ as long as 6 meters = __2__ meters

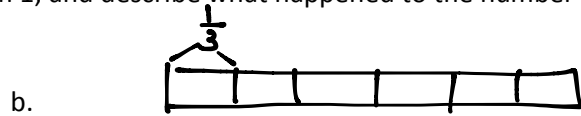 $\left(\frac{1}{3}\right) \times \boxed{6} = \frac{6}{3} = 2$

   b. 6 times as long as $\frac{1}{3}$ meter = __2__ meters

   $\left(6\right) \times \boxed{\frac{1}{3}} = \frac{6}{3} = 2$

2. Draw a tape diagram to model each situation in Problem 1, and describe what happened to the number of meters when it was multiplied by the scaling factor.

   a.

   Since the scaling factor is less than 1, the # of meters decreased.

   b.

   the scaling factor is greater than 1, so the # of meters increased from $\frac{1}{3}$ to 2.

3. Fill in the blank with a numerator or denominator to make the number sentence true.

   a. $5 \times \frac{7}{3} > 9$

   b. $\frac{6}{6} \times 12 < 13$

   c. $4 \times \frac{5}{5} = 4$

4. Look at the inequalities in each box. Choose a single fraction to write in all three blanks that would make all three number sentences true. Explain how you know.

   a. $\frac{2}{3} \times \frac{7}{5} > \frac{2}{3}$ $4 \times \frac{7}{5} > 4$ $\frac{5}{3} \times \frac{7}{5} > \frac{5}{3}$ Any fraction greater than 1 will work.

   b. $\frac{2}{3} \times \frac{3}{4} < \frac{2}{3}$ $4 \times \frac{3}{4} < 4$ $\frac{5}{3} \times \frac{3}{4} < \frac{5}{3}$ Any fraction Less than 1 will work.

5. Write a number in the blank that will make the number sentence true.

a. $3 \times \dfrac{1}{\underline{10}} < 1$

b. Explain how multiplying by a whole number can result in a product less than 1.

In general, multiplying by a fraction less than 1 will make a number get smaller. If the goal is to get a product less than 1, then the fraction can be a unit fraction with a denominator that is larger than the # being multiplied. In part (a), any denominator bigger than 3 would work.

6. In a sketch, a fountain is drawn $\frac{1}{4}$ yard tall. The actual fountain will be 68 times as tall. How tall will the fountain be?

$$\frac{1}{4} \text{ yd} \times 68 = \frac{1}{4} \times 68 \text{ yd}$$
$$= \frac{68}{4} \text{ yd}$$
$$= 17 \text{ yd}$$

The fountain will be 17 yd tall.

7. In blueprints, an architect's firm drew everything $\frac{1}{24}$ of the actual size. The windows will actually measure 4 ft by 6 ft and doors measure 12 ft by 8 ft. What are the dimensions of the windows and the doors in the drawing?

__windows__

$$\frac{1}{24} \times 4 \text{ ft} = \frac{1 \times 4}{24} = \frac{4}{24} = \frac{1}{6} \text{ ft}$$
$$\frac{1}{24} \times 6 \text{ ft} = \frac{1 \times 6}{24} = \frac{6}{24} = \frac{1}{4} \text{ ft}$$

$\frac{1}{6}$ ft by $\frac{1}{4}$ ft

OR

2 in by 3 in

__doors__

$$\frac{1}{24} \times 12 \text{ ft} = \frac{1 \times 12}{24} \text{ ft} = \frac{12}{24} = \frac{1}{2} \text{ ft}$$
$$\frac{1}{24} \times 8 \text{ ft} = \frac{1 \times 8}{24} \text{ ft} = \frac{8}{24} = \frac{1}{3} \text{ ft}.$$

$\frac{1}{2}$ ft by $\frac{1}{3}$ ft

OR

6 in by 4 in

Lesson 22:   Compare the size of the product to the size of the factors.
Date: 11/10/13

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