

Scale Drawings Notes

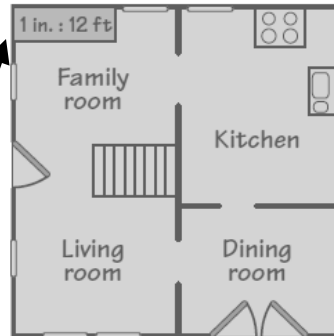
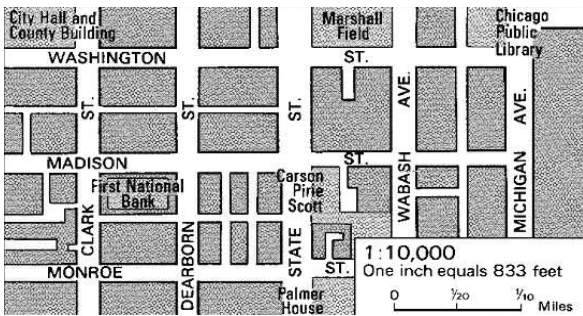
(SOL: 6.1/7.4/7.6)

Name: _____ Date: _____

A **SCALE DRAWING** is a diagram/map/model of an object that is too large or too small to draw. The dimensions are proportional to the actual dimensions (distances) of the real-life example. **Maps, blue prints, floor models are some examples.*

The **SCALE** on a scale drawing is the ratio of the drawing lengths or model to its corresponding actual lengths.

“1 in: 12 ft” means that 1 inch in the model represents an actual distance of 12 ft.



“Scale” dimensions in the scale drawing.



Study Tip

Scales are written so that the drawing distance comes first in the ratio.

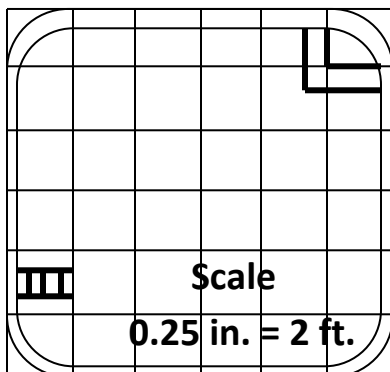
To find the actual distance from a scale drawing, use the scale to write a proportion and solve.

Example 1: On a map of Florida, the distance between Coral Springs and Fort Lauderdale is about 4.1 centimeters.

The scale on the map is **1 centimeter = 4.5 km**
What is the actual distance?

Example 2: On a map of North Carolina, the distance between Raleigh and Charlotte is $3\frac{1}{4}$ inches.
The scale on the map is **1 inch = 40 miles**. What is the actual distance?

Example 3: On the blueprint of the pool, each square has a side length of 0.25 in. What is the actual width of the pool?



Example 4: A designer has made a scale drawing of a living room for one of her clients.

The scale of the drawing is 1 inch = $1\frac{1}{3}$ feet. On the drawing, the sofa is 6 inches long. **Find the actual length of the sofa.**

Example 5: Inside the Lincoln Memorial, the chamber that features the marble statue of Abraham Lincoln has a height of 60 feet. Suppose a scale model of the chamber has a height of 4 in. **What is the scale of the model?**

Scale Factor

To find the scale factor for scale drawings and models:

- 1) Write the scale as a **ratio**, showing the scale length to the actual length;
- 2) Change the lengths to **the same unit of measurement** and then drop it;
(Usually convert the bigger unit to the smaller unit.)
- 3) **SIMPLIFY!**

a) Suppose a scale model has a scale of 2 inches = 3 feet. What is the scale factor?

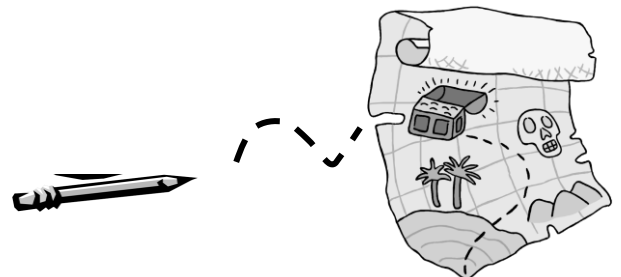
b) Suppose the scale is 2 inches = 4 yards. What is the scale factor?

Jacob has made a scale drawing of his yard. The scale of the drawing is **1 centimeter = 0.5 meter.**

1. The length of the patio is 4.5 centimeters in the drawing. **Find the actual length.**

2. The actual distance between the water faucet and the pear tree is 11.2 meters. Find the corresponding distance on the drawing.

3. Find the scale factor for the drawing.



Scale Drawings & Models- HOMEWORK

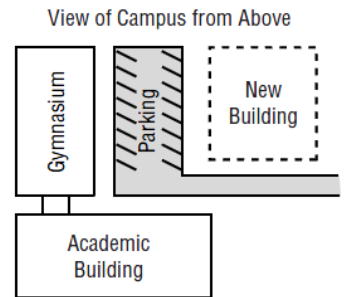
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For questions # 1–3, use the following information.

The local school district has made a scale model of the campus of Engels Middle School including a proposed new building. The scale of the model is **1 inch = 3 feet**.

1. An existing gymnasium is 8 inches tall in the model. How tall is the actual gymnasium?

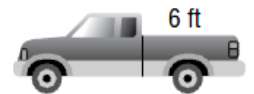
2. The new building is 22.5 inches from the gymnasium in the model. What will be the actual distance from the gymnasium to the new building if it is built?



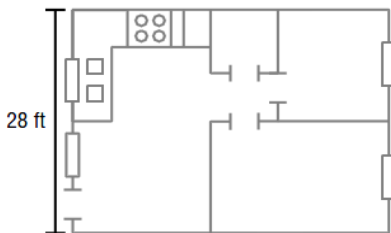
3. What is the scale factor of the model?

4. On a map, two cities are $5\frac{3}{4}$ inches apart. The scale of the map is $\frac{1}{2}$ inch = 3 miles. What is the actual distance between the towns?

5. The bed of Jerry’s pickup truck is 6 feet long. On a scale model of the truck, the bed is 8 inches long. What is the scale of the model?



6. Marta is making a scale drawing of her apartment for a school project. The apartment is 28 feet wide. On her drawing, the apartment is 7 inches wide. What is the scale of Marta’s drawing?



What is the scale factor of the model? _____

7. The smallest spider, the *Patu marples* of Samoa, is 0.43 millimeter long. A scale model of this spider is 8 centimeters long. What is the scale of the model?

*Review 8) Estimate $-\sqrt{118}$ to the nearest whole number.

Which of the following represents a proportional relationship?

A. $\frac{2}{3} = \frac{8}{12}$

B. $\frac{3}{4} = \frac{4}{5}$

C. $\frac{3}{5} = \frac{6}{7}$

D. $\frac{5}{6} = \frac{4}{5}$

Find the length/distance for each example given. Be sure to include units!

<u>Actual lengths</u>	<u>Scale</u>	<u>Model length</u>
A garage door that is 16 feet wide.	2 inches: 1 foot	
A surgical instrument is 150 millimeters long.	1 mm : $\frac{1}{2}$ cm	
A lake is 85 feet across (diameter).	1 in : 4 feet	
<u>Model lengths</u>	<u>Actual length</u>	
Los Angeles to San Diego, California Map Distance: 6.35 cm	1cm : 20 mi	
Chicago Illinois to Mexico City, Mexico Map Distance: 10.9 cm	1 cm: 250 km	

Multiple Choice You decide to use a scale of 1 in. : 8 ft to make a scale drawing of your classroom. If the actual length of your classroom is 36 feet, what should the length of the classroom in the drawing be?

- A. 1 in. B. 4.5 in. C. 36 in. D. 288 in.

Multiple Choice A child's picnic table is a scale model of an adult picnic table. The child's picnic table is 22 inches tall, and the adult picnic table is 33 inches tall. What is the model's scale?

- F. 1:22 G. 1:15 H. 1:1.5 I. 1:1

The liquid outer core of Earth is 2300 kilometers thick. A scale model of the layers of Earth has a scale of 1 in. : 500 km. How thick is the liquid outer core of the model?

- (A) 0.2 in. (B) 4.6 in. (C) 0.2 km (D) 4.6 km

