

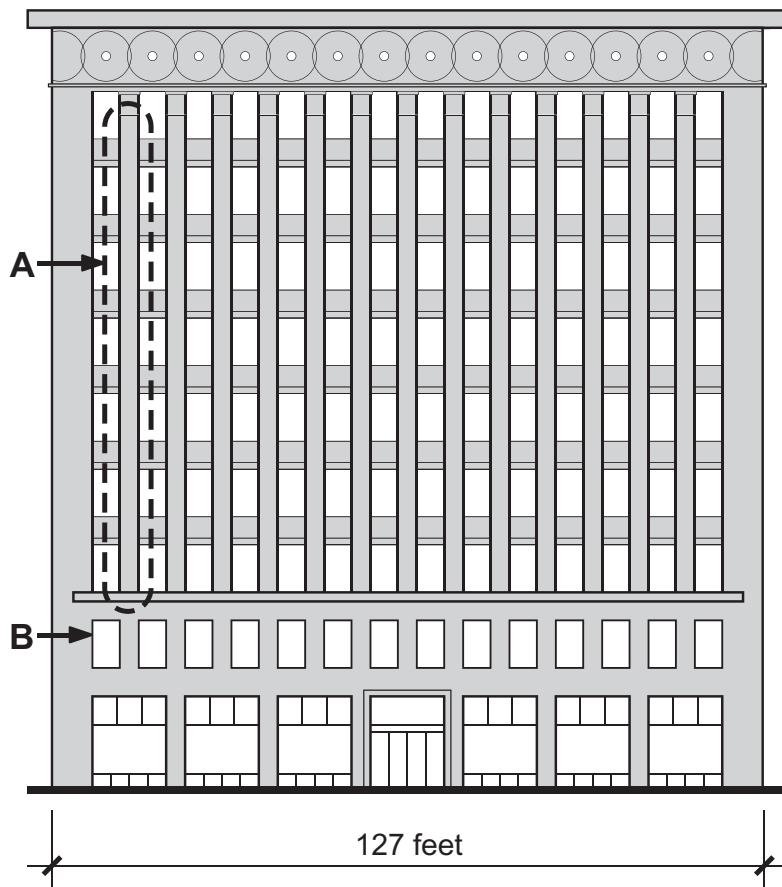
Mathematics Worksheet #1 (page 1) - It's in the Details: Math and Scale

This facade drawing of the Wainwright Building in St. Louis, Missouri is at 1/32 scale - meaning that 1/32" equals one foot, which can also be stated as 1" = 32'. Use the drawing to answer the following questions.

How wide is the **actual building** in feet? _____

How wide is the **drawing** of the building in inches? _____

Explain how you can use this scale drawing to determine how big a window is on the Wainwright Building.



Estimate the height of the pilaster (rectangle within the dotted oval) labeled "A." Show your work.

Estimate the size of the window (width and height) labeled "B." Show your work.

Calculate the area of the actual window in sq. feet and the area of the drawing of the window in sq. inches.

What else can you measure? Label items on the drawing and estimate the sizes on the back of this sheet.

Mathematics Worksheet #1 (page 2) - It's in the Details: Math and Scale

Based on your estimations for the actual sizes of the pilaster and the window, calculate the dimensions they would be if drawn at the scale of 1" = 8'.

At 1/8" scale, how tall should the drawing of the pilaster be? _____

At 1/8" scale, what is the size of the drawing of the window ? width: _____ height: _____

At 1/8" scale, what is the area of the drawing of the window in square inches? _____

Solve for X:

$$\frac{\text{height of window at } 1/8\text{" scale (sq. inches)}}{\text{height of window at } 1/32\text{" scale (sq. inches)}} = X$$

Explain how X can be used to convert the length of any object drawn at 1/32" scale to the correct length when drawn at 1/8" scale.

Solve for Y:

$$\frac{\text{area of window at } 1/8\text{" scale (sq. inches)}}{\text{area of window at } 1/32\text{" scale (sq.inches)}} = Y$$

Explain how Y can be used to convert the area of any object drawn at 1/32" scale to the correct area when drawn at 1/8" scale.

Explain the relationship between X and Y.

Mathematics Worksheet #2 - It's in the Details: Math and Scale

Using the 1/32" drawing to estimate measurements, enlarge a portion of the Wainwright Building to show more detail at 1" = 8'.

STEP 1: Create a 1" square box over a portion of the 1/32" scale façade drawing on page one of Math Worksheet #1. This is the area you will enlarge to create your detail drawing.

STEP 2: Convert the 1/32" scale dimensions to 1/8" scale dimensions.

STEP 3: At 1/8" scale, draw the portion of the facade in the box using the 1/8" grid at right.

STEP 4: Add more detail to the enlarged drawing based on information in the photos.

STEP 5: Explain why it is important for architects to create drawings at different scales.

