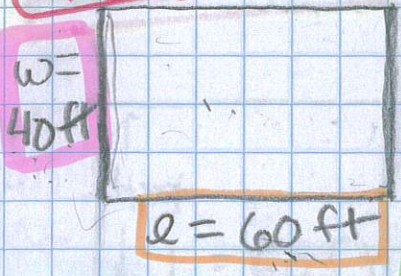


# 7.5 Scale Drawings p.3 12/16

EQ: How can we use proportions to make scale drawing & models.

Ex 1 Scale  $\Rightarrow$  1 box: 10ft

model  
real



$$\frac{P_m}{P_r} \rightarrow \frac{20b}{200ft} = \frac{1b}{10ft}$$

Same as Scale

$$\frac{A_m}{A_r} \rightarrow \frac{24b^2}{2400ft^2} = \frac{1b^2}{100ft^2}$$

$$\frac{P_m}{P_r} = \frac{1b}{10ft}$$

$$\frac{P_m}{P_r} = \frac{1b}{10}$$

$$A_m = \frac{1b^2}{100}$$

$$\frac{A_m}{A_r} = \frac{1b^2}{100ft^2}$$

Ex 2 Scale 1 box: 20ft

$$\frac{1box \times 2}{20ft \times 3} = \frac{b}{40ft}$$

model  
real



$$\frac{1b \times 3}{20ft \times 3} = \frac{b}{60ft}$$

Doubled the Scale, Drawing is 1/2 size.

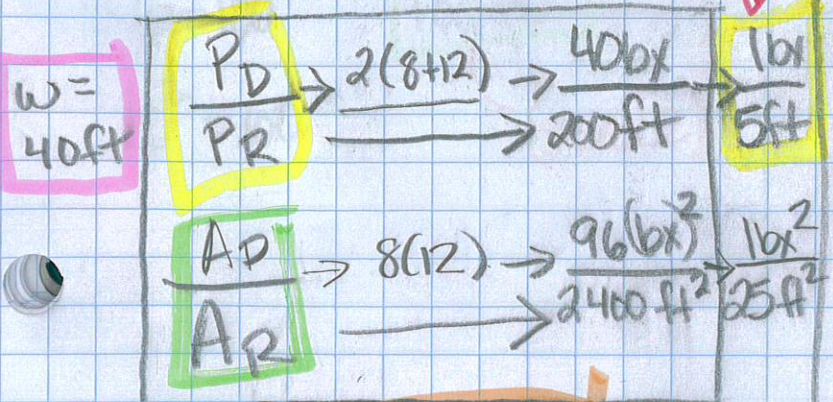
$$\frac{P_m}{P_r} \rightarrow \frac{10b}{200ft} = \frac{1b}{20ft}$$

$$\frac{A_m}{A_r} \rightarrow \frac{6b^2}{2400ft^2} = \frac{1b^2}{400ft^2}$$

Ex. Scale 1 box: 5ft

$$\frac{m}{r} \frac{1b \times 8}{5ft} = \frac{b}{40ft}$$

$$\frac{1b \times 12}{5ft} = \frac{b}{60ft}$$

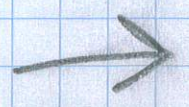


$$\frac{P_D}{P_R} \rightarrow \frac{2(8+12)}{200ft} = \frac{40b}{200ft} = \frac{1b}{5ft}$$

$$\frac{A_D}{A_R} \rightarrow \frac{8(12)}{2400ft^2} = \frac{96b^2}{2400ft^2} = \frac{1b^2}{25ft^2}$$

Ratio of  $\frac{\text{Perimeter (model)}}{\text{Perimeter (real)}}$  is SAME as the SCALE.

Ratio of  $\frac{\text{Area (model)}}{\text{Area (Real)}}$  is  $(SCALE)^2$



# Scale vs Scale Factor

\* Scale → What measurement on a drawing or model represents in real life.

ie. MAP → 1 in = 100 miles      MODEL 1 in = 16 ft

## DIFFERENT UNITS

\* Scale Factor → Ratio of how big the actual thing is compared to a model or drawing.

### Scale w/ the same Units

Ex. 1 | Scale on a map is 1 in = 100 miles. What is the Scale Factor?

$$\frac{1 \text{ in}}{100 \text{ mi}} \times \frac{1 \text{ mi}}{63,360 \text{ in}} = \frac{1}{633,600}$$

Conversion factor:  $\frac{1 \text{ mi}}{63,360 \text{ in}}$

1 ft = 63,360 ft  
1 meter = 633,600 meter

Ex. 2 | Scale Factor is  $\frac{1}{8}$

The real thing is 8 times bigger than the model.

$$\frac{\text{Drawing}}{\text{Real}} \rightarrow \frac{1}{8}$$

A drawing of a building is 50cm long. How many METERS is the building in real life?

Whatever units you want →

Scale Factor

$$\frac{1 \times 50}{8 \times 50} = \frac{50 \text{ cm}}{400 \text{ cm}}$$

Building is 400cm tall

$$4 \times 400 \text{ cm} \times \frac{1 \text{ m}}{100 \text{ cm}} = 4 \text{ m real height}$$