

# m9 7.12 scale drawings NC

April 11, 2018 2:03 PM



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**Learning Outcomes Covered:**

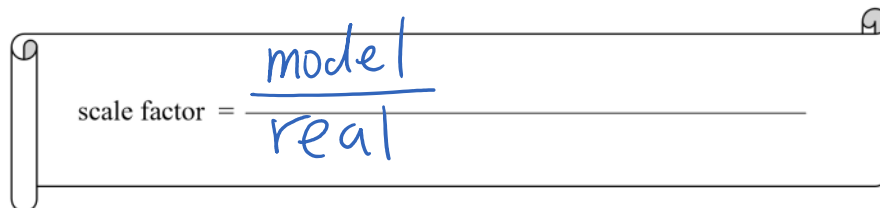
**7C:** I can determine the scale factor of a scale diagram.

**7D:** I can determine the length of missing sides of a scale diagram.

Figures that have the same shape, but different sizes are found throughout everyday life. Some examples include MAPS, BLUEPRINTS, MODELS OF ATOMS, MODEL TRAINS and PICTURES.

When you compare the drawing of an atom in your science textbook to the actual atom, the drawing is much larger. This is called an enlargement.

When you compare the model train to the real train, the model is much smaller. This is called a reduction. To determine how much larger or smaller the “model” is to the “real” object we determine the SCALE FACTOR. You must measure **corresponding** lengths.

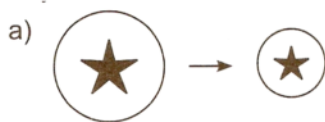

$$\text{scale factor} = \frac{\text{model}}{\text{real}}$$

If the scale factor is:

- Larger than 1, then the “model” is larger than the “real” object, and it is an enlargement.
- Smaller than 1, then the “model” is smaller than the “real” object, and it is a reduction.
- Equal to 1, then the “model” is the exact same size as the “real” object.

Scale factors can be represented as fraction, decimal or Percentage.  
ratio

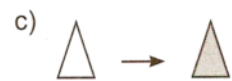
Example 1: State whether the transformation is an enlargement, a reduction, or neither.



Reduction



Enlargement



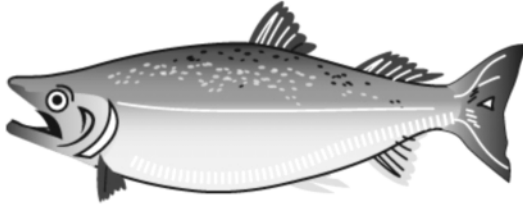
neither.

Example 2: Determine the scale factor for each of the following:

(a)

Image

Original



$$\text{Scale factor} = \frac{\text{Image}}{\text{Original}} = \frac{8\text{ cm}}{4\text{ cm}} = 2$$

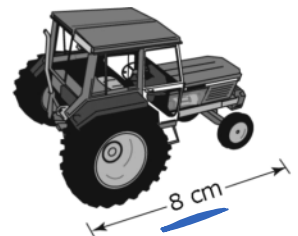
(b) The actual length of a needle is 6 cm. The length of the needle on a scale diagram is 9 cm. What is the scale factor of the diagram?

$$\text{Scale factor} = \frac{\text{Image}}{\text{Original}} = \frac{9}{6} = 1.5$$

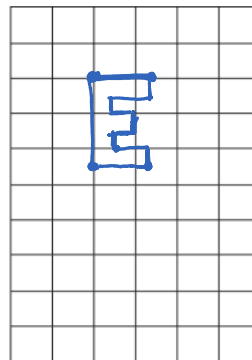
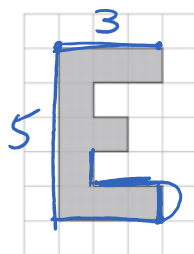
(c) A local farm equipment dealership has model tractors. The length of the actual tractor is 5.6 m. What scale factor was used for the reduction?

$$5.6\text{ m} = 560\text{ cm}$$

$$\text{Scale factor} = \frac{\text{Image}}{\text{Original}} = \frac{8}{560} = \frac{1}{70}$$



Example 3: Use a scale factor of 0.5 to reduce the figure below



**Math 9**  
**Section 7.1 and 7.2 – Scale Diagrams**

If we are given the scale, we can use a proportion to determine the value of either the “model” size or the “real” size. Note that a proportion is a statement of 2 equivalent fractions.

For example:  $\frac{2}{7} = \frac{6}{21}$  since both the numerator and denominators in the 1<sup>st</sup> fraction were multiplied by the same value to get the 2<sup>nd</sup> fraction. You must be able to solve a proportion.

**REVIEW:** Calculate the missing value in each proportion.

(a)  $\frac{2}{5} = \frac{\boxed{8}}{20}$   
*Handwritten: x4*

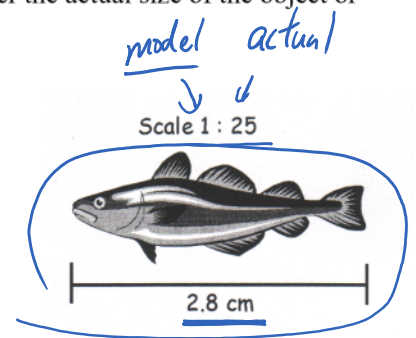
(b)  $\frac{3}{50} = \frac{21}{\boxed{350}}$   
*Handwritten: x7*

(c)  $\frac{3}{5} = \frac{8}{\boxed{13.\bar{3}}}$   
*Handwritten: ÷2.6, x2.6*

When the scale is given, you can use a proportion to determine either the actual size of the object or the model size of the object.

**Example 4:** Find the actual size of the fish.

$\frac{1}{25} = \frac{2.8}{\boxed{70 \text{ cm}}}$   
*Handwritten: x2.8, 25 x 2.8*



**Example 5:** If a blueprint of a house that is 16 m high is drawn to a scale of 1:100, what would the height of the drawing be in cm?

$\frac{1}{100} = \frac{16}{\boxed{1600}}$   
*Handwritten: x16, 16m = 1600cm*

**Example 6:** What is the height of the actual fingerprint?

$\frac{3}{1} = \frac{4}{\boxed{1.\bar{3} \text{ cm}}}$   
*Handwritten: ÷1.3, x1.3*

