

1.2 - Scale Diagrams

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SCALE FOR A REDUCTION DIAGRAM

A **scale diagram** is a drawing in which measurements are proportionally reduced or enlarged from actual measurement.

Scale is the ratio of a length on a diagram to the corresponding actual length.

The **scale factor** is $k = \frac{\text{diagram length}}{\text{actual length}}$

example: The picture below is an aerial photo of a school; the photo is a **reduction**. What is the scale factor of the photo? How long is the school?



- The 100 m length on the photo is measured to be 2.5 cm, so the

scale factor, $k = \frac{2.5\text{cm}}{100\text{m}} = \frac{2.5\text{cm}}{10000\text{cm}} = 0.00025$

need to be the same units

- Find the length of the school,

The school image is about 9.5 cm long.

$$k = \frac{\text{Diagram}}{\text{original}}$$

$$\overset{\times \text{ original}}{(0.00025)} = \frac{(9.5\text{cm})}{\cancel{\text{original}}}$$

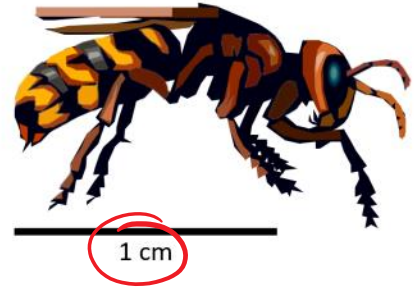
$$\text{original} \times (0.00025) = 9.5\text{cm}$$

$$\text{original} = \frac{9.5\text{cm}}{0.00025} = 38000\text{cm}$$

or 380m

SCALE FOR AN ENLARGEMENT DIAGRAM

example: The diagram of the wasp is an **enlargement**. What is the scale factor of this picture? How big is the actual wasp?



- The 1 cm length on the diagram is measured to be 4 cm on the page, so the scale factor,

$$k = \frac{\text{Diagram}}{\text{original}} = \frac{4 \text{ cm}}{1 \text{ cm}} = 4$$

- The wasp ^(diagram) image is 6 cm long. *(across your page)*

$$k = \frac{\text{Diagram}}{\text{original}} \Rightarrow \text{original} = \frac{6 \text{ cm}}{4} = 1.5 \text{ cm}$$

(4) = (6 cm) / original

What conclusion can you make about the scale factor of a reduction?

$$k < 1$$

What conclusion can you make about the scale factor of an enlargement?

$$k > 1$$