

6.2 Applying Scale Factors and Creating Scale Diagrams

NOTE: You **NEED** a ruler.
Obtain one **ASAP!**

Recall:

Scale Factors =

A scale factor > 1 would represent an **ENLARGEMENT** where an object gets **BIGGER** by the scale factor

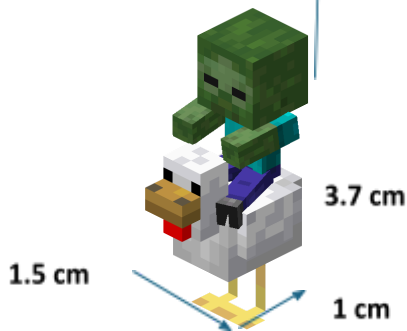
A scale factor < 1 would represent a **REDUCTION** where an object gets **SMALLER**

TODAY: How can we apply scale factors to create scale diagrams?

Example 1. Imagine, you are working as a graphic designer at an advertisement company.

The **image below** needs to be **enlarged** by a **scale factor of 4** to fit on a movie poster.

What should the **dimensions of the new image** be?



SF =



STEP 1: Use your scale factor formula to determine the **KNOWN** and **UNKNOWN**S

In our scenario this means

SF =

We know... The scale factor = **4**

The dimensions of the original object:

Length = 1.5 cm

Width = 1 cm

Height = **3.7 cm**

We **DON'T** KNOW... The **NEW** dimensions

STEP 2 SUBSTITUTE your scale factor, ONE known dimension and one **MATCHING** unknown dimension

Let's use **HEIGHT** Scale Factor = **4** =

STEP 3 Use **ALGEBRA** to isolate your **UNKNOWN** variable on one side.

To do so in this case, we will need to multiply **BOTH** sides by.... **3.7**

$$4 = (3.7) \times 4 = \underline{14.8} \text{ cm} = \text{NEW HEIGHT}$$

~~We can do the same for length and width New Length = 1.5 cm x 4 = 6cm = New width = 1 cm x 4 = 4cm~~

Example 2. This picture needs a scale factor of **0.75** applied to it.

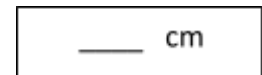
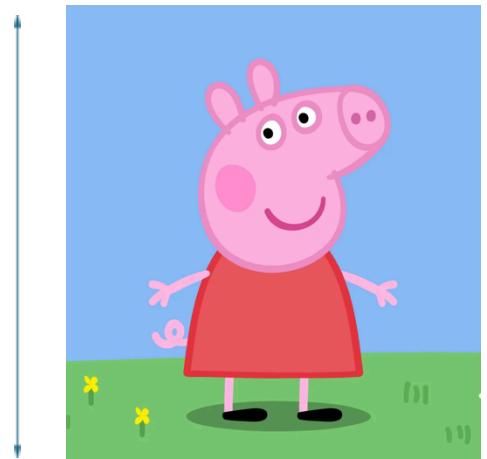
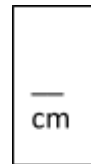
What should the **dimensions of the new image** be?

Note: All measurements in this question can be rounded to the tenths decimal place. **5.5 by 6**

STEP 1: Determine the dimensions of the ORIGINAL

(Measure the actual lengths, not the arrows)

This is where you will need... a ruler.



STEP 2: Use your scale factor formula to determine the KNOWNs and UNKNOWNs

We know... The scale factor = **0.75**

The dimensions of the original object:

Length = 5.5 cm Width = 6 cm

We DON'T KNOW... The NEW dimensions

STEP 3 SUBSTITUTE your known and unknown values in and **REARRANGE** to solve for each dimension.

Scale Factor =

0.75 =

REARRANGE

$$0.75 \times (5.5 \text{ cm}) = (5.5) \times$$

$$0.75 \times (5.5 \text{ cm}) = \text{New Length}$$

New Length = **4.125 cm or 4.1 cm**

Scale Factor =

Length **0.75 =**

REARRANGE

$$0.75 \times (6 \text{ cm}) = (6 \text{ cm}) \times$$

$$0.75 \times (6 \text{ cm}) = \text{New Width}$$

New Width = **4.5 cm**

Example 3. Mr. Lee thinks the rectangle pictured is the wrong size.

5 cm x 2.3

He needs you to create a better one (in his opinion) by applying a scale factor of 0.25

Determine the new dimensions (within a tenth of a centimeter) and **DRAW** the rectangle Mr. Lee is dreaming of.

Calculations

Draw the new rectangle here: