APRIL 14, 2016

UNIT 7: SIMILARITY AND TRANSFORMATIONS

7.1 / 7.2: SCALE DIAGRAMS: ENLARGEMENTS AND REDUCTIONS

M. MALTBY INGERSOLL
MATH 9

WHAT'S THE POINT OF TODAY'S LESSON?

We will begin working on the Math 9 Specific Curriculum Outcome (SCO) "Shape and Space 4" OR "SS4" which states:

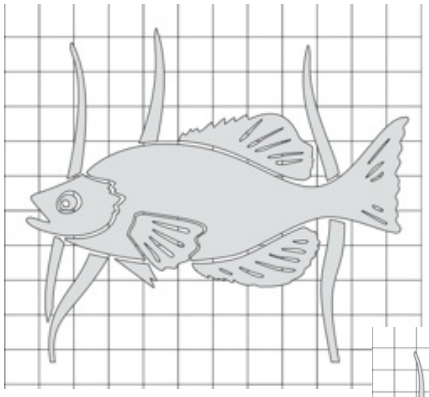
"Draw and interpret scale diagrams of 2-D shapes."

PLEASE TURN TO PAGE 314 IN *MMS9*:

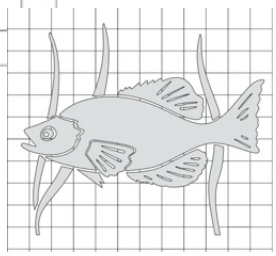
"What You'll Learn" / "Why It's Important"

Scale Diagram:

A diagram that is an enlargement or reduction of another diagram.



original



scale

The measurements in each diagram are compared.

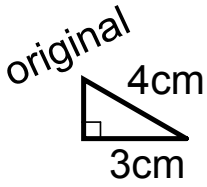
$$\text{Scale Factor} = \frac{\textit{Length of Scale Diagram}}{\textit{Length of Original Diagram}}$$

$$SF = \frac{S}{O}$$

The scale factor can be written as a fraction or decimal.

If the scale factor is less than one, the diagram is a reduction. If it is greater than one, it is an enlargement.

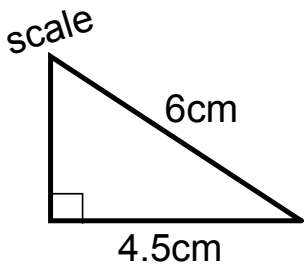
When pairs of corresponding lengths have the same scale factor, we say that the corresponding lengths are *proportional.*



Hypotenuse

$\frac{\text{scale}}{\text{original}} = \frac{6}{4}$

$= 1.5$

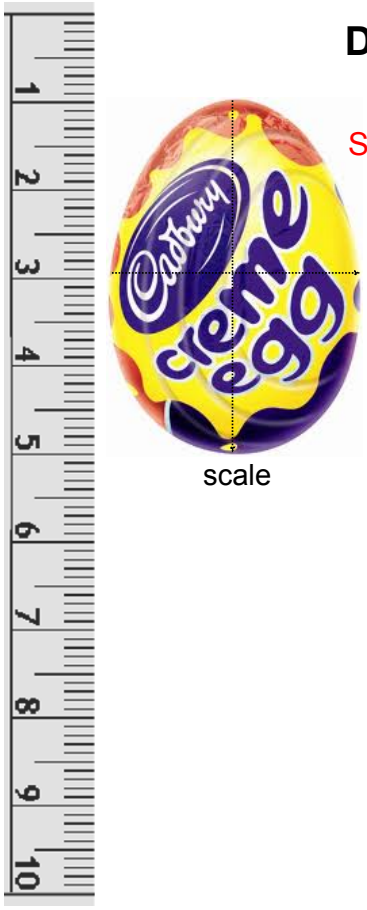


Leg

$\frac{\text{scale}}{\text{original}} = \frac{4.5}{3}$

$= 1.5$

original



scale

Determine the scale factor:

Scale Factor = $\frac{\textit{Scale Diagram}}{\textit{Original Diagram}}$

$= \frac{4}{5}$

$= 0.8$

This photo of longhouses has dimensions 9 cm by 6 cm.

The photo is to be enlarged by a scale factor of $\frac{7}{2}$. = 3.5

Calculate the dimensions of the enlargement.

original

6 cm

x3.5

9 cm x 3.5

scale

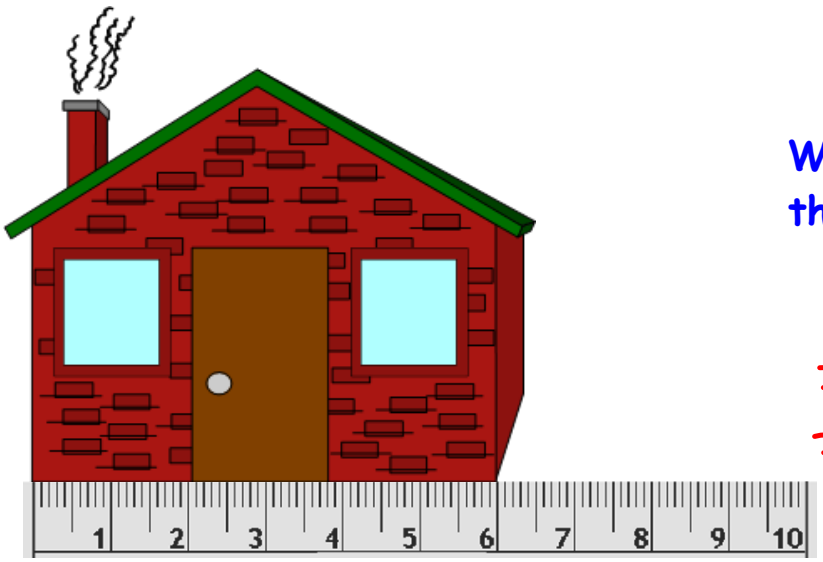
21cm

31.5cm

Sometimes you are only given the scale diagram....

A scale may be given as a ratio.

The scale on this scale diagram of a house is 1 : 150. This means that 1 cm on the diagram represents 150 cm (or 1.5 m) on the house. In other words, the scale factor is $\frac{1}{150}$.



What is the width of the actual house?

6×150

$= 900\text{ cm}$

$= 9\text{ m}$

Cross-multiplication

$\frac{1}{150} = \frac{6}{x}$

$x = 900\text{ cm}$

$\frac{1}{150} = \frac{6}{x}$

$\frac{x}{1}\left(\frac{1}{150}\right) = x\left(\frac{6}{x}\right)$

$\frac{x}{150} = 6$

$150\left(\frac{x}{150}\right) = 150(6)$

$x = 900\text{ cm}$

$x = 9\text{ m}$

CONCEPT REINFORCEMENT:

MMS9:

PAGE 323: #4,5,6,7 (scale = 48 mm)
& 8 (scale = 15 mm)

PAGE 324: #12 & 15a