

# Math 9

Name: \_\_\_\_\_

## 7.1 – Enlargements, Reductions & Scale Factors

Date: \_\_\_\_\_

A **Scale Diagram** is a diagram of an object that has been **ENLARGED** or **REDUCED** by a **SCALE FACTOR**.

**SCALE FACTOR** – A numeric value that you **MULTIPLY** each dimension on the **ACTUAL** sized object by to get the dimensions of the object in the **SCALE** Diagram.

$$\text{Scale Factor} = \frac{\text{Dimension on Scale Diagram}}{\text{Dimension on Actual Diagram}}$$

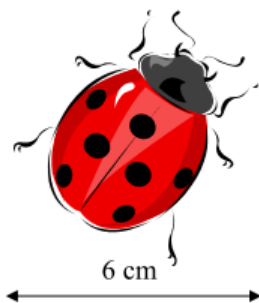
$$\text{Dimension on Scale Diagram} = SF \times \text{Dimension on Actual Diagram}$$

$$\text{Dimension on Actual Diagram} = \text{Dimension on Scale Diagram} \div SF$$

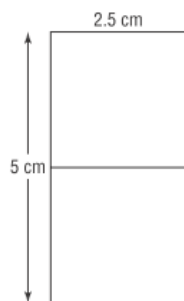
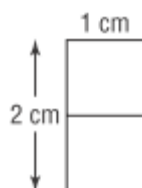
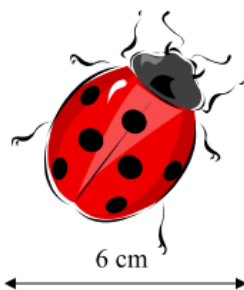
Actual Size Diagram



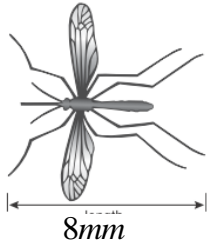
Scale Diagram



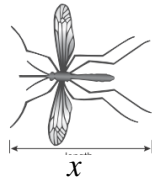
Value of Scale Factor (SF)



**Actual Size Diagram**

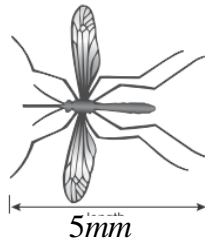
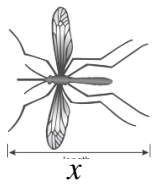


**Scale Diagram**



**Value of Scale Factor (SF)**

$$\frac{1}{2}$$



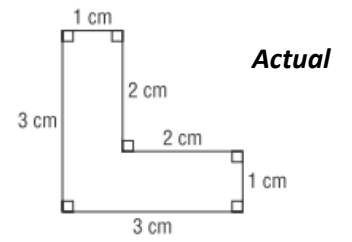
$$3.5$$

**Scale Factors can be written in 3 different forms: Fraction, Decimal, or Percent.**

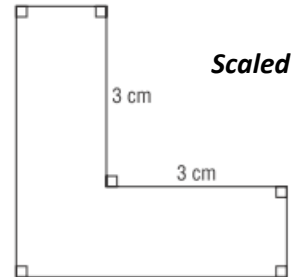
Fraction	Decimal	Percent
$\frac{1}{2}$		
	0.8	
		20%
$\frac{7}{2}$		
	4	
		270%

**Ex. 1:** The top diagram given below is scaled to the diagram given on the bottom:

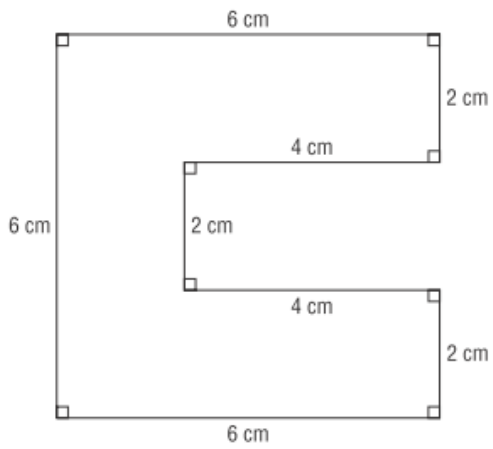
a. Determine the value of the SF as a decimal, fraction, and percent.



b. Determine the dimensions of the missing side lengths on the diagram.



**Ex. 2:** Sketch a scale diagram of the shape given below, if the scale factor is 25% .



**Ex. 3:** A photo has the dimensions,  $44\text{cm}$  by  $36\text{cm}$ . The photo is to be reduced by a factor of 4.

a. What is the scale factor?

b. What are the dimensions of the reduced photo?

**Ex. 4:** A drawing is 8.5 by 11 inches. A photocopier enlarges the drawing by 200%. What are the dimensions of the enlarged drawing?

**Ex. 5:** Buzz Light Year and Woody given below are scale models of the real characters. The model of Buzz is  $9.5\text{cm}$  tall and Woody is  $10.2\text{cm}$  tall. If the models are built to a scale factor of  $\frac{1}{18}$ , what are the actual heights of Buzz and Woody?