**JSS 2 MATHEMATICS**

***Lecture 2***

**TOPIC: SCALE DRAWING**

Scale drawing is a kind of drawing in which a large real life object is reduced to a smaller size or smaller real life object is enlarged to a larger size. The essence of this scale drawing is to represent a large real life object on a small paper. For example, to draw a large object such as a plan of a house, which reality is larger than your paper, you need to ***scale down.*** On the other hand, to draw a very small object such as a small watch on your paper, you need to ***scale up***. To scale down means to reduce while to scale up means to enlarge.

In scale drawing, every part of the drawing must be enlarged or reduced by a scale factor usually called a ***scale.***

**SCALE**

A scale is a ratio or proportion or fraction that shows the relationship between a length on a drawing and the corresponding length on the actual object.

$$scale=\frac{any length on scale drawing}{corresponding length on actual object}$$

Or

$$scale=\frac{any length on actual object}{corresponding length on scale drawing}$$

Scale can be represented in any of the following forms:

1. 1cm represent 10m
2. 1cm to 10m
3. 1cm : 10m or 1 : 1000
4. $\frac{1}{1000}$

For example, a scale of 1cm to 10m means that each length of 10m on the actual object is represented by 1cm on paper.

***Worked example***

**Example 1**: The scale of a drawing is 1cm to 30cm. if the side PQ = 120cm long on the actual drawing, what is the length of PQ on the scale drawing?

***Solution***

$$scale=1cm to 30cm=\frac{1}{30}$$

Let the length on scale drawing $=xcm$

$$scale=\frac{any length on scale drawing}{corresponding length on actual object}$$

Length on actual object $=120cm$

$$∴ \frac{1}{30}=\frac{x}{120}$$

Cross multiply

$$1×120=30×x$$

Divide both sides by 30

$$\frac{1×120}{30}=\frac{30×x}{30}$$

$$x=4cm$$

$$∴PQ=4cm on the scale drawing.$$

**Example 2**: The scale of a drawing is 2cm to 1km. If the length on the drawing paper is 7.8cm what is the actual length?

***Solution***

$$Scale:2cm to 1km=\frac{2}{1}$$

Let the actual length $=x$km

Length on scale drawing $=7.8cm$

$$∴ \frac{2}{1}=\frac{7.8}{x}$$

Cross multiply

$$2x=7.8$$

Divide both sides by 2

$$\frac{2x}{2}=\frac{7.8}{2}$$

$$x=3.9km$$

***Note*: in a scale, the first ratio always represents the value on drawing paper while the second ratio represents the value on actual object. Like in example 2; scale: 2cm to 1km, 2cm represents a value on drawing paper while 1km represents a value on actual object.**

***Assignment***

1. The scale of a drawing is 1cm represent 5km. If the actual length of a side of an object is 47.5km, what would be the corresponding length on drawing paper?
2. The length of a side of an object on the drawing paper is 19.2cm. If the scale of the drawing is 1cm : 3m, find the corresponding length of the object on real life.
3. Find the size of each angle marked by a letter in each of the following rhombuses. (hint: The sum of angle in a quadrilateral is equal to 360o)



1. Write the name of each of the following shapes and find the unknown angles.

