

# SCALE DRAWINGS

Maps and diagrams are representations of real objects but drawn to scale. This means that items within the diagram or map are shown as a fraction of their real size. The relationship between the size on the drawing compared with the size in real life is termed a ratio. It can be written down in two ways.

1. As a universal format, such as 1:10 or 1: 100,000. This means that every one unit measured on the drawing is equal to 10 or 100,000 units in real life. The advantage of this system is that it works whether you use metric or imperial units of value.
2. As a restricted format where the units are specified, such as 10 cm: 1 metre or 2.5 inches:1 mile. This only works when used within either metric or imperial systems.

To work out the size of objects in real life you multiply the measurements from the plan or map by the scale. You will then need to convert the results to appropriate units.

## Examples

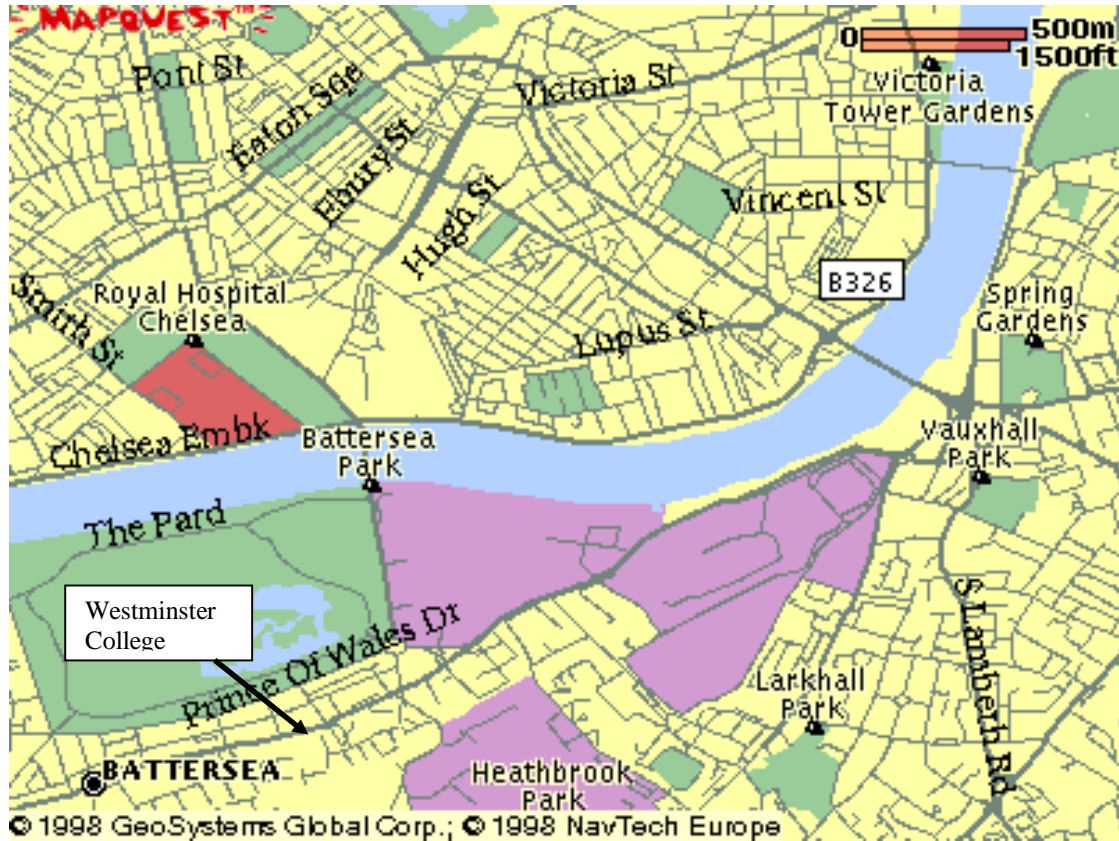
1. The dimensions of a room on a scale diagram were 10cm by 15cm. If the scale was 1:250 then the actual measurements were  
 $10\text{cm} \times 250 = 2500\text{cm} = 25 \text{ metres}$   
 $15\text{cm} \times 250 = 3750\text{cm} = 37.5 \text{ metres}$
2. The distance between two villages on a map of scale 1:50,000 was 4.8cm. The distance in real life was  
 $4.8\text{cm} \times 50,000 = 240,000\text{cm} = 2,400\text{m} = 2.4\text{km}$

## Exercise 1

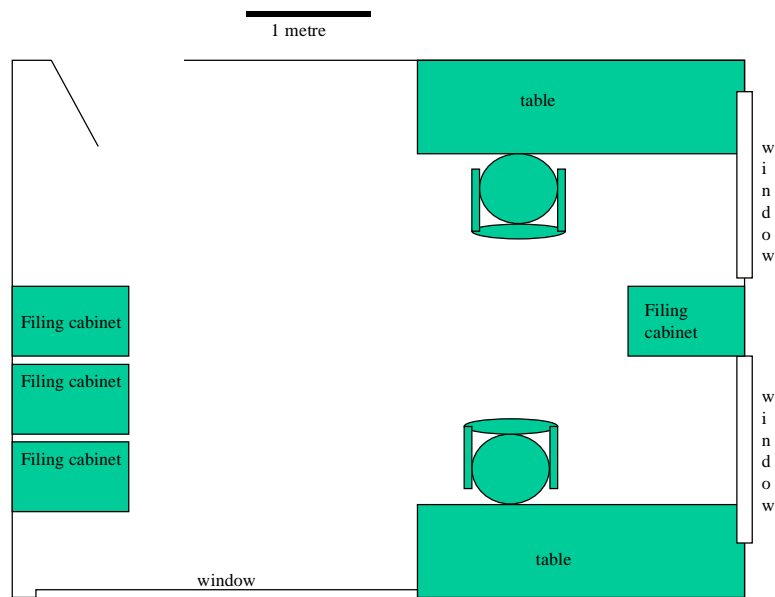
1. On a map of scale 1:100,000 what do the following measurements represent, (you will need to convert cm to m to km and inches to feet, yards and miles).  
a) 1 cm      b) 10cm      c) 25cm      d) 112.2cm      e) 1 inch
2. On a drawing of scale 1:25 what do the following measurements represent  
a) 1 cm      b) 1 inch      c) 5.5cm      d) 0.2cm      e) 5 inches
3. a) On the map of London measure the size of the scale bar and work out the distance represented by each cm on the map in metres.

b) Measure the distance from Westminster College to Spring Gardens and Victoria Tower Gardens in cm.

c) Convert the distance on the map to the distance in real life using the information from part a.



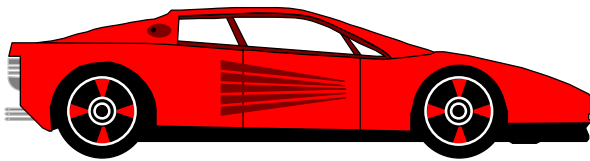
4.



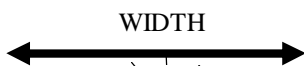
On the drawing above use the scale bar to calculate

- the length and width of the room
- the length and width of the table
- the length and width of the filing cabinet
- the length and width of the window

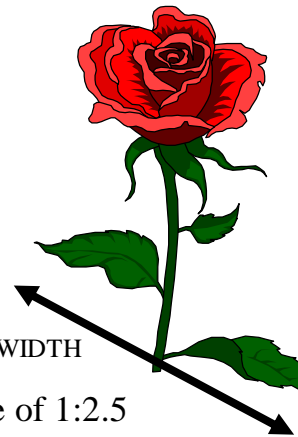
5. The objects below are drawn to scale. Measure the objects and use the scale to calculate the height and width of the objects.



The car is drawn to a scale of 1:100



The man is drawn to a scale of 1:42



The rose is drawn to a scale of 1:2.5

6. You should already have estimated and measured the size of the room you are currently working in. Use your measurements, and those of the objects in the room you also measured, to construct a rough scale drawing of the room, including tables and chairs. You will be provided with graph paper to help you with this.
- First of all you should decide upon the scale for your drawing, how many cm on your drawing are going to represent each metre of the room.
- Then you should calculate the size of the room and objects according to your scale.
- Finally you should construct your drawing.
- Remember to include your scale with your drawing.