



### Activity description

In this activity students measure lengths from scale drawings then use ratio scales to find the actual lengths.

### Suitability and time

Level 1/2 (Foundation/Intermediate/Higher)

1–3 hours, depending on how much preliminary work is needed and the number of worksheets used

### Resources and equipment

Information sheet, 7 worksheets containing plans with varying scales

*Optional* slideshow

Centimetre rulers, calculators

### Key mathematical language

Scale, actual size

### Notes on the activity

Before using this activity students will need to be able to measure accurately in centimetres or millimetres. They should also understand a scale given as a ratio, such as 1 : 100.

You may wish to show students how to use a scale and convert the units before they try to do this for themselves. The scales used on the plans are of varying difficulty to provide differentiation.

### During the activity

Students could work in pairs to check each other's answers before attempting one plan on their own.

### Points for discussion

Discuss the meaning of a ratio scale and the method for using it to work out actual measurements. Include conversions from centimetres (or millimetres) to metres.

### Extensions

Students could measure the classroom or their bedroom and some pieces of furniture, then draw them to scale. Cut out the scaled furniture and show a new layout for the room. This could involve a total re-design of their bedroom using a catalogue for dimensions (and costs).

## Answers

Check accuracy after printing, and allow  $\pm 1$  mm.

Allow answers given in centimetres or millimetres.

### Flat

Room	Length on plan	Width on plan	Actual length	Actual width
Living room	8 cm	5.5 cm	8 m	5.5 m
Kitchen	5 cm	3 cm	5 m	3 m
Bedroom	5 cm	4.2 cm	5 m	4.2 m
Bathroom	3 cm	2.5 cm	3 m	2.5 m
Study	4 cm	2.2 cm	4 m	2.2 m

### Garden

Dimension	On plan	Actual
Garden – length	8.8 cm	17.6 m
Garden – width	7.6 cm	15.2 m
Vegetable plot – length	5.4 cm	10.8 m
Vegetable plot – width	1.3 cm	2.6 m
Shed – length	1.5 cm	3 m
Shed – width	1.2 cm	2.4 m
Greenhouse – length	2.2 cm	4.4 m
Greenhouse – width	1.4 cm	2.8 m
Patio – length	5.7 cm	11.4 m
Patio – width	1.6 cm	3.2 m
Flowerbed – diameter	2.5 cm	5 m
Pond – diameter	1.6 cm	3.2 m

### Park

Dimension	On plan	Actual
Grass – length	8.2 cm	41 m
Grass – width	4.3 cm	21.5 m
Swings and roundabouts – length	4.3 cm	21.5 m
Swings and roundabouts – width	3.4 cm	17 m
Café – length	3.0 cm	15 m
Café – width	2.3 cm	11.5 m
Toilets – length	1.6 cm	8 m
Toilets – width	1.5 cm	7.5 m
Tennis court – length	5.5 cm	27.5 m
Tennis court – width	3.2 cm	16 m
Shop – length	1.9 cm	9.5 m
Shop – width	1.6 cm	8 m

## Youth club

Dimension	On plan	Actual
Main room – length	6 cm	6 m
Main room – width	4.2 cm	4.2 m
Games room – length	6.6 cm	6.6 m
Games room – width	3 cm	3 m
Store cupboard – length	3 cm	3 m
Store cupboard – width	2 cm	2 m

Dimension	On plan	Actual
Cloakroom – length	3.6 cm	3.6 m
Cloakroom – width	3 cm	3 m
Corridor – length	3 cm	3 m
Corridor – width	1 cm	1 m
Youth club – length	10.8 cm	10.8 m
Youth club – width	6 cm	6 m

## Common room

Dimension	On plan	Actual
Common room – length	11.8 cm	5.9 m
Common room – width	11.2 cm	5.6 m
Coffee making area – length	4 cm	2 m
Coffee making area – width	2 cm	1 m
Work tables – length	8.4 cm	4.2m
Work tables – width	1.2 cm	0.6 m
Computer area – length	4.6 cm	2.3 m
Computer area – width	1.2 cm	0.6 m

Dimension	On plan	Actual
Shelves – length	5.4 cm	2.7 m
Shelves – width	0.6 cm	0.3 m
TV stand – length	1.8 cm	0.9 m
TV stand – width	1.5 cm	0.75 m
Coffee table – length	2.6 cm	1.3 m
Coffee table – width	1 cm	0.5 m
Sofa – length	4.2 cm	2.1 m
Sofa – width	1.8 cm	0.9 m

## Bedroom

Dimension	On plan	Actual
Bedroom – length	16.6 cm	3.32 m
Bedroom – width	13.8 cm	2.76 m
Bed – length	9.5 cm	1.9 m
Bed – width	4.5 cm	0.9 m
Wardrobe – length	6 cm	1.2 m
Wardrobe – width	2.5 cm	0.5 m
Drawers – length	3.4 cm	0.68 m
Drawers – width	2 cm	0.4 m

Dimension	On plan	Actual
Table – length	2.2 cm	0.44 m
Table – width	2 cm	0.4 m
Shelves – length	2.8 cm	0.56 m
Shelves – width	1.5 cm	0.3 m
Window – width	6.2 cm	1.24 m
Door – width	3.8 cm	0.76 m
Workstation – length	5 cm	1 m
Workstation – width	2.9 cm	0.58 m

## Kitchen

Dimension	On plan	Actual
Kitchen – length	16 cm	4 m
Kitchen – width	12.8 cm	3.2 m
Table – length	4.8 cm	1.2 m
Table – width	3.6 cm	0.9 m
Sink – length	4.4 cm	1.1 m
Sink – width	2 cm	0.5 m
Cooker – length	2.4 cm	0.6 m

Dimension	On plan	Actual
Cooker – width	2.4 cm	0.6 m
Boiler – length	2.6 cm	0.65 m
Boiler – width	2.4 cm	0.6 m
Fridge – length	2.4 cm	0.6 m
Fridge – width	2.4 cm	0.6 m
Window – width	6.4 cm	1.6 m
Doors – width	3 cm	0.75 m