


Scales


In plans and maps, ratio is used to make comparisons between actual dimensions and drawn dimensions. This **ratio** is called a **scale**.

A **scale drawing or model** is an **enlarged or reduced drawing or model** of an object.



e.g. 1:100 means one unit on a drawing is 100 of the **same** units for the object on the ground.


note The first value always represents the drawn dimensions on the map or plan.



- A map scale is 1:25 000. On the map, the distance between two shopping centres is 4 cm. What is the actual distance in km ?

$1 \text{ cm on map} = 25\,000 \text{ cm on ground}$
 $4 \text{ cm on map} = 4 \times 25\,000 \text{ cm}$
 $= 100\,000 \text{ cm} = 1 \text{ km}$
- If 2 cm on a map represents 6 km on the ground, what is the scale?


$2 \text{ cm on map} = 6 \text{ km on ground}$
 $1 \text{ cm on map} = 300\,000 \text{ cm on ground}$
scale = 1 : 300 000



- A scale is 1:50. The actual length of a desk is 120 cm. What is scale drawing length ?

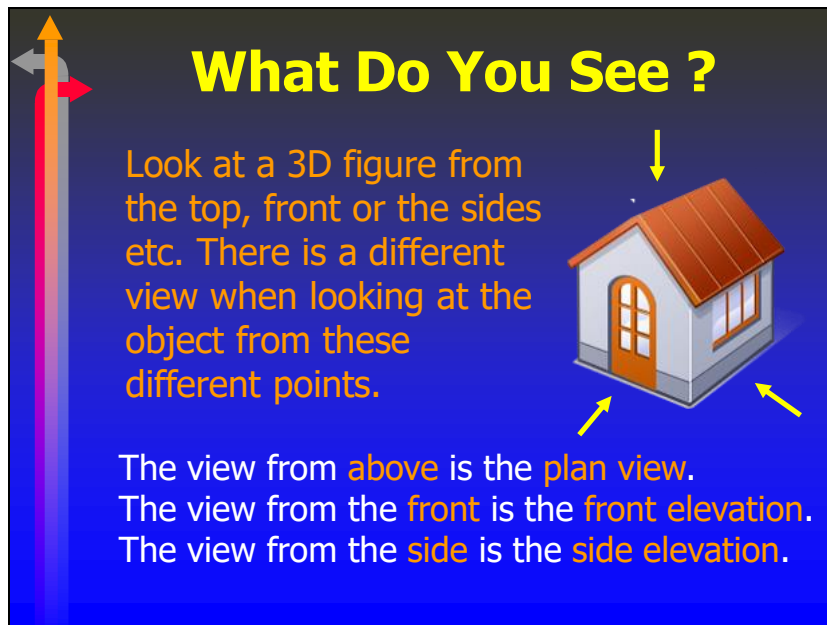
Scale = $1 \div 50$ of actual
= $1 \div 50 \times 120 \text{ cm} = 2,4 \text{ cm}$

- Using a 1:25 scale, find the scale model for a boat if the actual dimensions are 50m x 15m x 22m.




What Do You See ?

Look at a 3D figure from the top, front or the sides etc. There is a different view when looking at the object from these different points.




The view from **above** is the **plan view**.
The view from the **front** is the **front elevation**.
The view from the **side** is the **side elevation**.



Architects draw 2D views of 3D buildings to show what the building will look like from each side. These scale drawings are called plans and elevations.

Let's practise "seeing things."

Hint



To **see** what to draw, highlight the edges and faces for **a** view eg top. Then make that view flat.

1. How many cubes were used to make this solid?

2. Identify the plan view (P), the front elevation (F) and the side elevation (S).

The diagram shows a 3D solid composed of 6 yellow cubes. A vertical arrow labeled 'P' points down from the top, representing the plan view. A horizontal arrow labeled 'F' points from the left, representing the front elevation. A diagonal arrow labeled 'S' points from the bottom-right, representing the side elevation. To the left of the text is a vertical bar with a color gradient from purple to yellow, with a grey arrow pointing left and a red arrow pointing right.

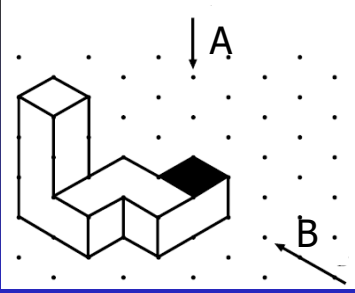
Below the text are three white 2D grid diagrams representing possible views:

- Diagram 1: A 2x2 grid of squares with one square on top of the right-hand square.
- Diagram 2: A 2x3 grid of squares with one square on top of the middle square.
- Diagram 3: A 2x3 grid of squares with one square on top of the middle square.

1. How many cubes were used to make this solid?

2. Identify the plan view (P), the front elevation (F) and the side elevation (S).

The 3D solid is composed of 10 cubes. The front elevation (F) shows a row of 3 cubes on the left and a column of 3 cubes on the right. The side elevation (S) shows a row of 2 cubes on the left and a column of 3 cubes on the right. The plan view (P) shows a row of 3 cubes on the left and a single cube on the right.



This 3-D shape is made from seven cubes. One of the faces seen from A is shaded.

- Draw the plan view from A.
- Draw the front elevation from B.

Plan view

Front

Side

Three views of a 3D object is shown. Draw the 3D object.

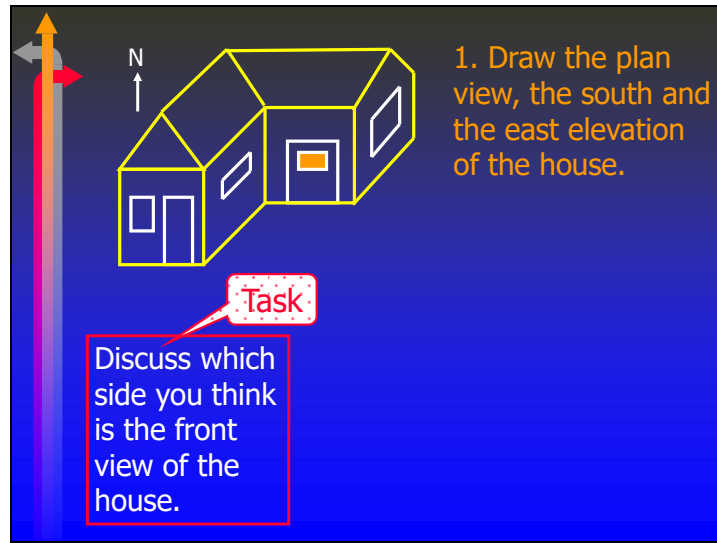
Front

Hint: Start with the front and turn it about 45° .

1. Identify the plan view, the side elevation and the front elevation of the tool shed .

2. What do you notice about the height of F and S ?

3. Find other relationships.



1. Draw the plan view, the south and the east elevation of the house.

Task

Discuss which side you think is the front view of the house.

A floor plan is a scale diagram of arrangements of rooms, drawn as if seen from above.

The floor plan for the doll's house is below.

What do A and B represent?

Why does A have an arc?

What are the actual dimensions ?

Scale 1 : 50
