

Scale drawing

Notes and guidance

In this small step, children apply their understanding of ratio and multiplicative relationships through scale diagrams. Before children begin to draw, it is important to spend time exploring what scale diagrams are by getting them to decide by eye if diagrams are accurately scaled or if the proportion of the dimensions has been changed.

Children become familiar with the language of “Each square represents ...” to explain the relationship between the original image and its scale drawing.

Encourage children to explore different ways of calculating scaled lengths using multiplicative relationships between numbers. For example, if 3 cm represents 9 cm, then to find what 6 cm represents they can either multiply 9 cm by 2 or multiply 6 cm by 3 to find the result, 18 cm.

Once children are confident with this and are able to draw squares and rectangles, they may move on to drawing more complex rectilinear shapes.

Things to look out for

- Children may identify the correct scale of enlargement but still become confused by whether they need to multiply or divide.

Key questions

- How do you know if a diagram is drawn to scale?
- Why might you need to draw a scale diagram?
- If 1 square represents 5 cm, what do _____ squares represent? How do you know?
- If 1 square represents 5 cm, how many squares represent _____ cm? How do you know?
- Is there more than one way of finding the missing value?
- How is a scale like a ratio?

Possible sentence stems

- _____ squares represents _____, so each square represents _____
- Each square represents _____, so _____ squares represent _____ \times _____ = _____
- Each square represents _____, so _____ is represented by _____ \div _____ = _____ squares.

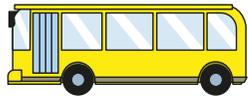
National Curriculum links

- Solve problems involving similar shapes where the scale factor is known or can be found

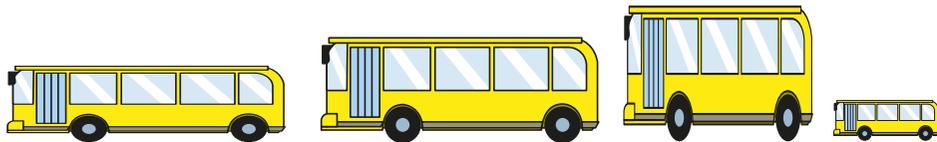
Scale drawing

Key learning

- Here is a picture of a bus.

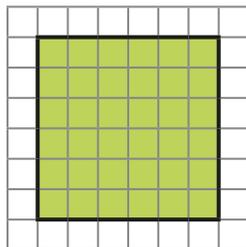


Which two pictures are scale drawings of the original?



- A square has side lengths of 12 cm.

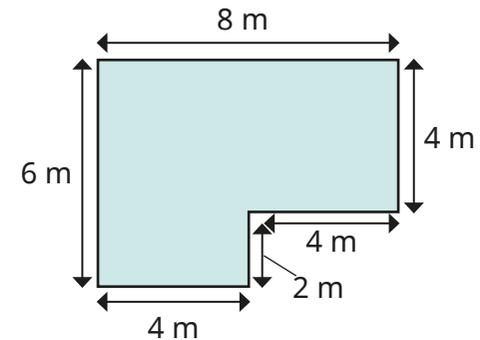
Scott has drawn a scale diagram of the shape in which the side length of each square in the grid represents 2 cm.



Use squared paper to draw other scale diagrams using the side length of each square to represent:

- 3 cm
- 4 cm
- 6 cm
- 12 cm

- This is a plan of a classroom.



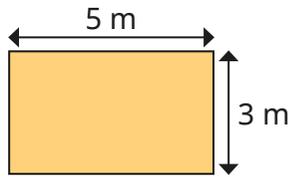
Using squared paper, draw a scale diagram of the classroom if each square on the grid represents 2 m.

- A football pitch measures 48 m by 72 m.
Using squared paper, draw a scale diagram of the football pitch if each square on the grid represents 8 m.
- On a scale diagram, 4 cm represents 1 m.
 - ▶ What does 8 cm represent?
 - ▶ What does 40 cm represent?
 - ▶ What does 2 cm represent?
 - ▶ What does 1 cm represent?
 - ▶ What length in centimetres would represent 3 m?

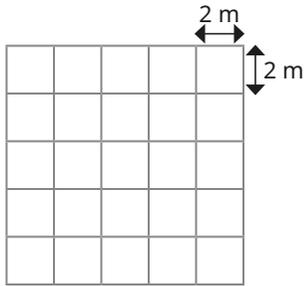
Scale drawing

Reasoning and problem solving

Tiny wants to draw a scale diagram of this rectangle.



Each square on the grid represents 2 m.



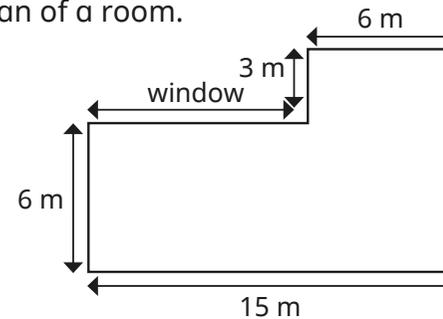
I cannot draw it on this grid, because 3 and 5 are not multiples of 2

Do you agree with Tiny?

Explain your answer.

No

Here is a plan of a room.



Draw a scale diagram of the room where each square represents 3 m.

What is the actual length of the window?

What is the area, in squares, of the room in the scale diagram?

What is the actual area of the room?

Explain the connection between your answers.

9 m

12 squares

108 m²