SCALE DIAGRAMS

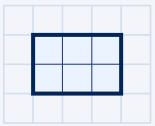
BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

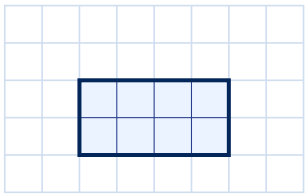
KEY IDEA

On a scale diagram, every length is shrunk by the same amount.
Here 1 square represents 2 m.

3 squares long → 3 × 2 = 6 m. 2 squares wide → 2 × 2 = 4 m.



1 On this plan, 1 square represents 5 m.



a) Real length = ☐ m

b) Real width = ☐ m

2 On a diagram, 1 cm represents 10 m. Fill in the boxes.

a) Find the real length.

× 3	**1 cm**	represents	**10 m**	
	3 cm	represents	☐ m	☐

b) Find the length on the diagram.

☐	**1 cm**	represents	**10 m**	
	☐ cm	represents	**50 m**	☐

3 A playground is 8 m long and 6 m wide. On the grid, 1 square represents 2 m.

a) Squares long: ☐

b) Squares wide: ☐

c) Draw it on the grid.

4 On a plan, 1 cm represents 3 m. Fill in the boxes.

a) Find the real length.

× 4	**1 cm**	represents	**3 m**	
	4 cm	represents	☐ m	☐

b) Find the length on the plan.

☐	**1 cm**	represents	**3 m**	
	☐ cm	represents	**15 m**	☐

SCALE DIAGRAMS

SUPPORT

NAME _____ CLASS _____ DATE _____

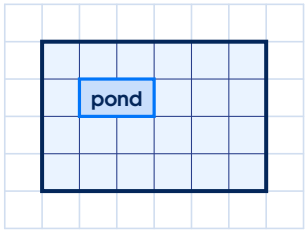
KEY IDEA

A scale tells you what a length on the diagram represents. Say "represents", not "equals". Do the same to both sides.

Going back? 200 m is 4 × 50 m, so 4 cm.

	1 cm represents **50 m**	
× 3		× 3
	3 cm represents **150 m**	

1 This is a plan of a garden with a pond. 1 square represents 2 m.



a) Real garden: ☐ m by ☐ m

b) Real perimeter of the garden: ☐ m

c) Real pond: ☐ m by ☐ m

2 On a diagram, 1 cm represents 25 m. Fill in the boxes.

a) Find the real length.

☐ | **1 cm** represents **25 m** / **6 cm** represents ☐ m | ☐

b) Find the length on the diagram.

☐ | **1 cm** represents **25 m** / ☐ cm represents **200 m** | ☐

3 A room is 10 m long and 6 m wide. On the grid, 1 square represents 2 m.

a) Length: ☐ squares

b) Width: ☐ squares

c) Draw the scale diagram.

4 Scale: 1 cm represents 4 m. Tom says, "A 20 m wall is 80 cm on the diagram."

a) What mistake has Tom made? .....

b) Find the correct length.

☐ | **1 cm** represents **4 m** / ☐ cm represents **20 m** | ☐

SCALE DIAGRAMS

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

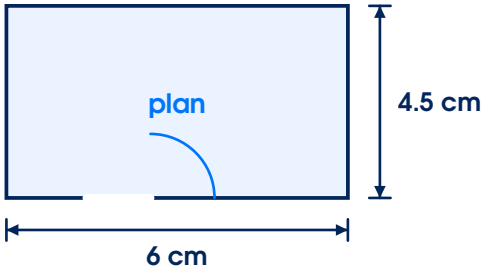
A scale diagram is similar to the real object: every length is multiplied by the same scale factor. Diagram → real: multiply by the scale. Real → diagram: divide. Keep units consistent.

FLUENCY

1 The scale of a diagram is 1 cm represents 50 m. Complete the table.

on diagram	3 cm	7.4 cm		
real length			260 m	1.1 km

2 This plan of a room is drawn using the scale 1 cm represents 0.8 m. It is not drawn to scale here.



a) Real length: _____ m

b) Real width: _____ m

c) Real floor area: _____ m²

REASONING

3 A football pitch is 100 m by 64 m. Its scale diagram must fit on paper 25 cm by 18 cm. Which scale is best? Explain.

1 cm represents 2 m | 1 cm represents 5 m | 1 cm represents 10 m

Best scale: _____ Why? .....

.....

4 Harry draws a plan of a 12 m by 8 m garden as a 6 cm by 5 cm rectangle. Explain why this is not an accurate scale diagram.

.....

SCALE DIAGRAMS

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) On a scale diagram, real lengths are longer than diagram lengths. ALWAYS SOMETIMES NEVER

b) Changing the scale from "1 cm represents 2 m" to "1 cm represents 4 m" halves every length on the diagram. ALWAYS SOMETIMES NEVER

c) If 1 cm represents 5 m, then 1 cm^2 on the diagram represents 5 m^2. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 On a scale drawing, a 30 m tall building is 6 cm tall. A tree is 2.3 cm tall on the drawing.

a) How tall is the real tree? ☐ **b)** Scale as a ratio: 1 : ☐

3 On a diagram of a cell, 1 cm represents 0.02 mm. The cell is 4.5 cm long on the diagram. (1 mm = 1000 µm)

Real length: ☐ mm = ☐ µm

★ CHALLENGE FOR ALL

4 A classroom plan has scale 1 : 50. On the plan, the room is 18 cm by 14 cm. Each desk is really 120 cm by 60 cm.

a) Find the real length and width of the room in metres. ☐

b) Find the size of a desk on the plan. ☐

c) Find the real floor area of the room. ☐

d) What real area does 1 cm^2 on the plan represent? ☐

SCALE DIAGRAMS – ANSWERS

ANSWERS

BUILDING BLOCKS

1 a) 20 m · b) 10 m
2 a) 30 m · b) × 5 on both sides: 5 cm
3 a) 4 · b) 3 · c) a rectangle 4 squares by 3 squares
4 a) × 4 on both sides: 12 m · b) × 5 on both sides: 5 cm

SUPPORT

1 a) 12 m by 8 m · b) 40 m · c) 4 m by 2 m
2 a) × 6 on both sides: 150 m · b) × 8 on both sides: 8 cm
3 a) 5 squares · b) 3 squares · c) a 5 by 3 rectangle
4 a) He multiplied by 4 instead of dividing · b) 20 m is 5 × 4 m, so × 5 on both sides: 5 cm

CORE

1 150 m · 370 m · 5.2 cm · 22 cm
2 a) 4.8 m · b) 3.6 m · c) 17.28 m²
3 1 cm represents 5 m: 20 cm by 12.8 cm fits well. 2 m gives 50 cm by 32 cm (too big); 10 m gives 10 cm by 6.4 cm (fits, but small)
4 12 ÷ 6 = 2 but 8 ÷ 5 = 1.6, so the lengths are not scaled by the same factor (width should be 4 cm)

GREATER DEPTH

1 a) Sometimes, e.g. a map (true), an enlarged diagram of an insect (false) · b) Always · c) Never – it represents 5 m × 5 m = 25 m²
2 a) 1 cm represents 5 m, so 11.5 m · b) 1 : 500
3 4.5 × 0.02 = 0.09 mm = 90 μm
4 a) 9 m by 7 m · b) 2.4 cm by 1.2 cm · c) 63 m² · d) 0.25 m² (50 cm × 50 cm)