

Scale Diagrams Maps

KS3 Maths · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

A map has scale 1:10,000. A park measures 6cm on the map. Find the real length.

Step 1 · Multiply by the scale factor

$$6\text{cm} \times 10,000 = 60,000\text{cm}$$

Step 2 · Convert cm to m

$$60,000\text{cm} \div 100 = 600\text{m}$$

Answer: 600m

Check: $600\text{m} \times 100 = 60,000\text{cm}$; $60,000 \div 10,000 = 6\text{cm}$ ✓

2. Now try one with the steps

Two landmarks are 3.5km apart in reality. Find the distance on a map with scale 1:50,000.

Step 1 · Convert real distance to cm

Step 2 · Divide by the scale factor

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

- 1.** A map has a scale of 1:50,000. A road on the map measures 4cm. Find the real distance in km. [2]

- 2.** A scale drawing uses 1cm to represent 2m. How long is a wall that measures 7.5cm on the drawing? [2]

- 3.** On a map with scale 1:25,000, two towns are 8.4cm apart. Find the real distance in km. [3]

4. A real distance of 15km needs to be shown on a map with scale 1:100,000. How many cm should be drawn? [3]

5. A scale model of a building is built at 1:200. The model is 35cm tall. Find the real height of the building in metres. [3]

6. Two cities are 180km apart in reality. A map shows them 9cm apart. Find the scale of the map in the form 1:n. [4]

7. A plan uses a scale of 1 cm to 5 m. A wall is 3 cm long on the plan. How long is the real wall? [1]

8. A map has a scale of 1:20,000. Two shops are 5 cm apart on the map. How far apart are they in real life, in metres? [2]

9. A map has a scale of 1:50,000. A real distance is 6 km. How long is it on the map? [2]

10. A map uses a scale of 1 cm to 4 km. Two villages are 22 km apart. How far apart are they on the map? [2]

11. Write the scale '1 cm represents 2 km' ratio in the form 1:n. [2]

12. A model car is made to a scale of 1:18. The real car is 4.5 m long. How long is the model in cm? [2]

13. On a 1:25,000 map, how long is a 7.5 km walk? [2]

14. A garden measures 12 m by 8 m. Ifeoma draws it to a scale of 1:200. What are the dimensions of her drawing in cm? [3]

15. A floor plan is drawn to a scale of 1:50. A room measures 9 cm by 7 cm on the plan. Find the real floor area in m². [3]

4. Before you hand it in

Forgetting to convert units consistently (mixing cm and km without converting)

Always work in the SAME unit first (usually cm), do the scale calculation, THEN convert to the unit asked for in the question (m or km) at the very end.

Dividing by the scale factor when finding the real distance (should multiply)

Map → Real: MULTIPLY by the scale factor (the real world is bigger). Real → Map: DIVIDE by the scale factor (the map is smaller). Remember: 1:50,000 means 1 cm on the map = 50,000cm in reality.

Finding a real area by multiplying the drawing's area by the scale number

Turn each length on the drawing into a real length first, then multiply them. A 1:100 scale makes lengths 100 times bigger but areas $100 \times 100 = 10,000$ times bigger.