Scale drawings: fact sheet

Planner week 13 · Learn these facts

Map to real

1 cm represents 4 km

8 cm × 4 = 32 km

Multiply by the scale

Real to map

10 km ÷ 4 = 2.5 cm

Divide by the scale

Give units: cm

Ratio scales

1 : 25 000

1 cm is 25 000 cm

= 250 m

Same units both sides

Changing units

100 cm = 1 m

1000 m = 1 km

100 000 cm = 1 km

cm → km: ÷ 100 000

Models

scale 1 : 24

1920 cm ÷ 24 = 80 cm

Model is smaller: divide

Estimating heights

man ≈ 1.8 m

tree ≈ 5.7 men tall

≈ 10 m

How many times taller?

Drawing to scale

35 m ÷ 5 = 7 cm

20 m ÷ 5 = 4 cm

Divide every length

Draw with a ruler

Units

cm → m	÷ 100
m → km	÷ 1000
cm → km	÷ 100 000

Key words

- **Scale** how lengths on a drawing match real lengths
- **Scale drawing** a smaller accurate copy
- **1 : 200** 1 cm on the drawing is 200 cm real
- **Represents** stands for

Exam tips

- Map → real: multiply. Real → map: divide.
- Measure in cm with a ruler.
- Ratio scale: answer is in cm first, then change units.
- Check the size makes sense.
- Write the units every time.
- Average man: about 1.7 to 1.8 m tall.

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Worked example

QUESTION

A map has a scale of 1 : 25 000. A road is 14 cm long on the map. Work out the real length of the road in kilometres.

ANSWER

1. Real length = 14 × 25 000 = 350 000 cm
2. Change to metres: 350 000 ÷ 100 = 3500 m
3. Change to kilometres: 3500 ÷ 1000

3.5 km

Multiply by the scale, then change the units.

How to do it

1. Measure the map length in cm.
2. Map → real: multiply by the scale.
3. Real → map: divide by the scale.
4. Ratio scales give cm: change to m or km.
5. Check your answer is sensible.

Model answer:

3.5 km

Watch out

- Dividing when you should multiply.
- Forgetting to change cm to km.
- Measuring from the wrong end of the ruler.