

## 3.1.2 Scale Drawings

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Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

**KEY WORDS** scale

<!-- Session 2 native-skill companion -->

### Objective

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Practise scale drawings within the labelled native lessons. Public original tasks; locally authored answer guidance.

### 1 Key knowledge and worked examples

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#### ■ Scale drawings and maps · Foundation

In a scale 1:n, one drawing unit represents n of the same real unit. Multiply a drawing length by n to obtain the real length; divide a real length by n to draw it. Then convert the unit. Measure only when the diagram explicitly supplies an accurate scale.

$$L_{\text{real}} = nL_{\text{drawing}}$$

At 1:25,000, 4 cm represents 100,000 cm=1000 m=1 km. A real 1.5 km path is 150,000 cm, so it measures 150,000/25,000=6 cm on the map. A room 6 m by 4 m drawn at 1:100 becomes 6 cm by 4 cm because each metre is 100 cm. Its drawing diagonal is  $\sqrt{(6^2+4^2)} \approx 7.21$  cm and the real diagonal is about 7.21 m. Enlarging the printed map changes its numerical scale: doubling drawing lengths halves the scale denominator. A scale bar printed with the map enlarges with it.

A ratio compares matching units. Never measure a diagram marked not to scale. A photocopied numerical scale can become invalid even though its scale bar still works.

AQA R2 includes maps, scale factors and geometric problems. Label drawing and real dimensions separately; reverse the calculation to verify the scale. Use an exact ratio until the context asks for rounding.

## Match units before applying the scale

4 cm on map



1 km on ground at 1:25,000

*Original native-lesson illustration; labels belong to its worked example.*

## 2 Practice

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**2.1** (Foundation) At 1:25000, find the real length in km for 4 cm.

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**2.2** (Foundation) Find the drawing length in cm of a 1.5 km route at that scale.

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**2.3** (Foundation) Find the drawing width in cm of a 4 m room at 1:100.

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### 3 Exam-style questions

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**3.1** Decide whether this claim is true. Justify with a concrete calculation or counterexample: A scale of 1:25000 means 1 cm represents 25000 km.

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## Solutions

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**2.1**  $4 \times 25000 / 100000 = 1$  km.

**2.2** 1.5 km = 150000 cm; divide by 25000.

**2.3** 4 m = 400 cm;  $400 / 100 = 4$  cm.

**3.1** False. The ratio uses matching units: 1 cm represents 25000 cm = 250 m = 0.25 km.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.