

3.1.2 Scale Drawings

Name: _____ Class: _____ Date: _____

KEY WORDS scale

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

Objective

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

1 Key knowledge and worked examples

■ 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 $\sqrt{6^2+4^2}\approx7.21$ 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

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

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

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

3 Exam-style questions

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.

Solutions

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.