

Teacher guide and workbook answers

Pearson Edexcel GCSE Mathematics 1MA1 • L014

60 minutes • Foundation and Higher • Teacher use only • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose and prerequisites

Use constant multiplicative relationships for recipes and length scales, with consistent units and checks.

L013 ratio and equal parts; L010 fraction operators; centimetres/metres and grams/kilograms.

Selected specification content: R1 R2 R6 R7 R8 R10. These lessons revisit shared content; they do not complete every aspect of those statements.

Preparation and support

Prepare mini-whiteboards, printed fallbacks and a teacher calculator. Use fraction strips, equal-part bars or a ratio table as appropriate. Confirm save/export/restore in the intended environment; browser QA remains pending. Distribute only the learner package.

Access: pre-teach vocabulary and read symbols aloud. Scaffold: model the first decision, offer a worked-example or inverse-check frame. Core: remove prompts for A2 and P1–P2. Stretch: C1–C2 deepen reasoning for either tier. Record the support used, not a fixed ability label.

Evidence and pacing

The delivery map totals 60 minutes. Use the recall and hinge to select a repair; the suggested one-third error trigger is a planning judgement, not a validated threshold. If errors are widespread, use two minutes from independent practice and defer C2. P1–P2 need teacher marking. The mini-test and exam practice are delayed/additional activities, not extra tasks squeezed into the hour.

On a 1:500 plan, 3 cm represents A 15 m, B 1500 m, C 1.5 m. A: $3 \times 500 = 1500 \text{ cm} = 15 \text{ m}$.

Recall and guided-practice answers

R1

2:3; 20 and 30. Equivalent ratios preserve the relationship.

R2

300 cm; 1.5 kg. 100 cm per metre; 1000 g per kilogram.

R3

450. $300 \div 2 \times 3$.

D1

750 g. Scale 8 to 10 by $\frac{5}{4}$, or use 75 g per person.

D2

25. Multiply the first value by 2.5.

D3

35 m. $7 \times 500 = 3500$ cm.

D4

3 cm. $1500 \div 500 = 3$.

Application and challenge answers

A1

5 m; 15 m; 30 m. All lengths scale by the same factor.

A2

360 g; 4 cm. 40 g per person; $800 \text{ cm} \div 200$.

A3

30 m; 20 m; perimeter 100 m. $2 \times (30 + 20) = 100$; lengths scale before perimeter.

C1

Only A. A costs £0 at 0 km and doubles when distance doubles; B has a fixed £4 charge. A constant rate plus a fixed charge is not direct proportion.

C2

1:250. Each printed centimetre now represents half the previous real distance. The original written scale is no longer correct for ruler measurements.

Calculator guidance: Optional check after A3: $6 \times 500 \div 100 = 30 \text{ m}$; $4 \times 500 \div 100 = 20 \text{ m}$; $2 \times (30 + 20) = 100 \text{ m}$. Drawings are schematic and not for measuring. Print resizing does not change the labelled lengths.

Independent evidence and next steps

P1

$200 \div 4 \times 7$ M1; 350 g A1. Keep the recipe ratio constant.

P2

$5 \times 400 = 2000$ cm M1; 20 m A1. Do not interpret 400 as metres.

P3

Individual reflection. Record support and delayed evidence; completion is not mastery.

F1

6 m; 400 g. Use one consistent scale factor.

F2

£1.50. Unit prices allow fair comparisons.

Retrieval answers: 10, 3, 300, 60, 250, 12. Exact signed decimals/fractions/mixed numbers are accepted; unsupported notation goes to review. No automatic method marks. For rounding, equivalent numerical values may pass retrieval; the teacher checks stated accuracy and required trailing zeros in written work.

Reteaching and release

If learners add the change in people to grams, test the constant ratio. If 1:500 is read as 1 cm to 500 m, convert units explicitly. If printing changes a diagram, use stated lengths rather than a ruler. Recheck 2 cm at 1:400 is 8 m.

Practice feedback is intentionally visible. Full assessment answers, this guide and delivery notes are teacher-only. Local saving is browser dependent; no account service is included. Completed resources enter Review; human approval and outstanding browser checks remain required.

Optional extension answers

Stretch

A scale drawing is 1:25,000. What actual distance does 8 cm represent?

Answer and reasoning: $200,000 \text{ cm} = 2 \text{ km}$.

Deep challenge

Similar shapes have length factor 1.5. Compare their area factor and explain.

Answer and reasoning: Area factor $1.5^2 = 2.25$, since both dimensions scale.

Activate Learning lesson cycle

Connect & Check: state the objective and diagnose prior knowledge. Share: pairs predict and compare methods. Present: explain or uncover the model. Apply: fade support for independent practice and optional stretch. Recall & Review: use a fresh question and feedback to decide the next step.

Recall & Review: feedback and extension integration

Source-integrated WWW/EBI and extension page

Lesson L014: Scale and proportion

Objective: Use constant multiplicative relationships for recipes and length scales, with consistent units and checks.

Timing for a 60-minute lesson

0-7 Connect & Check; 7-14 Share; 14-25 Present/model; 25-44 Apply route choice/practice; 44-52 independent exam-style check; 52-60 Recall & Review, WWW/EBI and next step.

Recall & Review evidence

At the end of the lesson, solve a fresh question without prompts, explain a check, correct one error and record the next practice step.

What Went Well (WWW)

I selected a suitable representation or multiplier and kept the reference amount clear.

Even Better If (EBI)

I will state the whole/part, show each operation and check that the size of my answer is reasonable.

Integrated stretch and deep challenge

Stretch: A scale drawing is 1:25,000. What actual distance does 8 cm represent?

Deep challenge: Similar shapes have length factor 1.5. Compare their area factor and explain.

Teacher use

Use the WWW/EBI prompts to write mathematics-specific feedback linked to the objective. Do not accept generic praise; feedback should identify the method, representation, reasoning or checking step that improved, then set a fresh next-step question.

Assessment evidence to inspect: Check the formative mini-test and independent workbook response against the objective. Use the teacher answers or mark guidance; group errors for reteaching. Non-calculator core; optional calculator check.