

Slide by slide delivery map

Pearson Edexcel GCSE Mathematics 1MA1 • L030

26 slides • 60 minutes • Teacher use only • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

01 Enlargement and scale factors 1 min Recall

Enlarge shapes from a stated centre, including positive fractional factors, and explain how centre and factor determine the image.

02 The goal and the evidence 1 min Recall

L029 coordinates and transformations; L014 scale factors; fractions.

03 Starting-point diagnostic 5 min Recall

If all coordinates are multiplied when the centre is not origin, first mark the displacement from the actual centre. If a half factor is called impossible, compare same ray distances. Recheck C(1,1), P(3,1), $k=2 \rightarrow (5,1)$.

04 See the geometry 2 min Discover

For centre C and point P, the image lies k times as far along the ray CP for positive k. In coordinates $P'=C+k(P-C)$. Subtract the centre, multiply the displacement, then add the centre back. A factor between 0 and 1 makes the image smaller; $k=1$ leaves it unchanged.

05 Worked example and your turn 3 min Discover

(9,6). Multiply both coordinates.

Delivery continued

06 Worked example and your turn 3 min Discover

(4,3). Same ray, half the distance.

07 Worked example and your turn 3 min Discover

P'(3,5). Displacement (1,2) doubles to (2,4).

08 Worked example and your turn 3 min Discover

$k=1.5$; 6 cm. $9 \div 6 = 1.5$, then 4×1.5 .

09 A method you can explain 2 min Discover

Draw rays from the centre through vertices. Multiply each centre-to-vertex distance by k ; join images in order. Check a side-length ratio and one ray. The centre remains fixed.

10 Diagnostic pause 3 min Apply

Centre (1,1), point (3,1), factor 2. Image A (6,2), B (5,1), C (4,1). Answer B: double displacement (2,0), then add centre.

Delivery continued

11 Careful variation 4 min Apply

(8,4); (4,2); (2,1). Same ray; distances scale.

12 Independent application 4 min Apply

(2,2),(6,2),(2,4); horizontal side $2 \rightarrow 4$. All displacements double.

13 Use the method in context 4 min Apply

P'(1.5,1), Q'(2.5,1), R'(1.5,2). Halve centre-relative displacements.

14 Intentional practice feedback 2 min Apply

Halve centre-relative displacements. Optional check: for C(1,1), P(2,3), $k=2$, calculate $1+2 \times (2-1)$ and $1+2 \times (3-1)$. Expect 3 and 5. Brackets preserve the displacement calculation.

15 A claim to test 4 min Challenge

Enlargement preserves angles; it halves lengths from the centre and side lengths. Shape remains similar.

Delivery continued

16 Deepen the reasoning 4 min Challenge

12 cm; divide 9 by $\frac{3}{4}$. A positive factor below 1 reduces each length. Check $12 \times \frac{3}{4} = 9$.

17 Retrieval without notes 2 min Prove

Answers: 6, 3, 2.5. Completion is not mastery.

18 Retrieval without notes 2 min Prove

Answers: 3, 5, 6. Completion is not mastery.

19 Independent exit evidence 2 min Prove

P–C=(1,2), doubled (2,4) M1; P'(3,5) A1. Add centre back.

20 Independent exit evidence 3 min Prove

0.4 B1; 6 cm B1. Use image/object.

Delivery continued

21 Feedback and next steps 2 min Prove

If all coordinates are multiplied when the centre is not origin, first mark the displacement from the actual centre. If a half factor is called impossible, compare same ray distances. Recheck $C(1,1)$, $P(3,1)$, $k=2 \rightarrow (5,1)$.

22 Before the next lesson 1 min Recall

A bearing is measured clockwise from north at the starting point and written using three digits. Scale drawings convert real distances to paper lengths using a consistent scale.

23 Negative enlargement alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. A negative factor puts the image on the opposite side of the centre. For centre $C(1,1)$, point $P(3,2)$ and factor -2 , the displacement $P-C=(2,1)$. Multiply by -2 to get $(-4,-2)$, then add C : $P'=(-3,-1)$. The distance from C doubles; the direction reverses. Use each vertex separately and check a side-length ratio of 2.

24 Reverse direction from the centre alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. A negative factor reverses the direction from the centre, not the sign of a physical length. Use $|k|$ for length ratios. Factor -1 is a half-turn about the centre, not a reflection in a line.

25 Independent Higher evidence alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. $(2,3) \times -2 = (-4,-6)$ M1; image $(-3,-5)$ A1.

Delivery continued

26 Independent Higher evidence alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. Lengths remain positive/equal to original B1; image is on opposite side of centre at equal distance B1.

Recall & Review: feedback and extension integration

Lesson L030: Enlargement and scale factors

Objective: Enlarge shapes from a stated centre, including positive fractional factors, and explain how centre and factor determine the image.

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 one check, correct one error and record the next practice step.

What Went Well (WWW)

I selected the correct geometric fact, theorem, formula or transformation and used a clear diagram with appropriate labels and units.

Even Better If (EBI)

I will name the fact or theorem, show the substitution or construction step and check whether the size, direction and units of the result are reasonable.

Integrated stretch and deep challenge

Stretch: Enlarge a rectangle 3 cm by 5 cm by factor 2.5. Find new area.

Deep challenge: An enlargement factor is -2 about the origin. Where does $(3, -4)$ map, and what happens to orientation?

Teacher use

Use the What Went Well (WWW) and Even Better If (EBI) prompts to write mathematics-specific feedback linked to the objective. Do not accept generic praise: 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. Optional check: for $C(1,1)$, $P(2,3)$, $k=2$, calculate $1+2\times(2-1)$ and $1+2\times(3-1)$. Expect 3 and 5. Brackets preserve the displacement calculation..