

Fractions and percentages

Pearson Edexcel GCSE Mathematics 1MA1 • L010
Foundation and Higher • 60 minutes • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

Use fractions and percentages as operators, recover a whole from a known fraction, and explain the chosen reference amount.

Work without a calculator except where a check is invited. Write on the lines or replace them with typed answers. Attempt before reading intentional practice feedback.

Connect & Check

Operator: an instruction that scales a quantity. Reference amount: quantity treated as the whole or 100%. Unit fraction: one equal part. Original amount: quantity before a stated operation.

R1

Write $\frac{3}{5}$ as a percentage and 15% as a decimal.

R2

Calculate $(\frac{2}{3}) \times (\frac{3}{4})$.

R3

Calculate $80 \div 5$ and $80 \div 10$.

Share | In pairs, predict the first step for this problem: Three fifths of 80 is $(80 \div 5) \times 3 = 48$ because five equal parts make the whole. The same calculation is 80×0.6 . For 15% of 80, 10% is 8 and 5% is 4, so the result is 12. A decimal multiplier gives $80 \times 0.15 = 12$. Compare your reasons before using the worked model.

Present through worked examples

Three fifths of 80 is $(80 \div 5) \times 3 = 48$ because five equal parts make the whole. The same calculation is 80×0.6 . For 15% of 80, 10% is 8 and 5% is 4, so the result is 12. A decimal multiplier gives $80 \times 0.15 = 12$.

D1

Model: $\frac{3}{5}$ of 80 = $80 \div 5 \times 3 = 48$. Find $\frac{3}{4}$ of 28.

D2

Model: 15% of £80 is £8 + £4 = £12. Find 35% of £60.

D3

Model: 125% of 40 = $1.25 \times 40 = 50$. Find 150% of 24.

D4

Model: $\frac{3}{5}$ of a whole is 24; one fifth is 8, so the whole is 40. If $\frac{2}{3}$ of a whole is 18, find the whole.

Apply with less support

Name the whole and write the fraction or decimal multiplier. Calculate, include units and check size. To recover a whole from a known fraction, find one part then all parts, or divide by the fraction. An operator above 1 increases the quantity.

A1

Find 10%, 5%, 15% and 150% of 80. Explain which result exceeds 80.

A2

Find (a) $\frac{7}{8}$ of 64 (b) 12.5% of £48 (c) the whole when $\frac{3}{4}$ equals 27.

A3

A group has 30 learners. Two fifths walk to class. Of those walkers, 25% carry a bag. How many walkers carry a bag?

Optional support: Combine benchmark percentages.

Optional check after A2: $(7 \div 8) \times 64 = 56$; $0.125 \times 48 = 6$; $27 \div 0.75 = 36$. Use the ordinary decimal multiplier so calculator-specific percentage-key behaviour is avoided.

Apply and extend reasoning

C1

Is 20% of 50 equal to 50% of 20? Explain why the equality holds.

C2

A learner knows that $\frac{3}{5}$ of a number is 30 and multiplies 30 by $\frac{3}{5}$ again. Explain the error and recover the number.

Intentional practice feedback — read after attempting

A1: 8; 4; 12; 120.

A2: 56; £6; 36.

A3: 3 learners.

C1: Yes, both 10; $(\frac{20}{100}) \times 50 = (\frac{50}{100}) \times 20$.

C2: 50, since one fifth is 10. Multiplying again finds $\frac{3}{5}$ of the part, not the whole.

Correct one response and explain your change. Stretch is available to either tier; temporary support needs do not determine entry tier.

Recall & Review through retrieval

Work without notes. Six retrieval points; this attempt does not establish mastery. Equivalent exact numeric forms are accepted. Where accuracy is requested, also state the requested form in your written work.

Q1 $\frac{3}{4}$ of 32

Q2 15% of 60

Q3 125% of 24

Q4 Whole when $\frac{2}{5}$ is 14

Q5 12.5% of 40

Q6 HCF of 12 and 18

Intentional retrieval feedback

Q1 24; Q2 9; Q3 30; Q4 35; Q5 5; Q6 6. Correct and retry tomorrow, then in one week.

Prove independently and improve

P1–P2: five minutes without notes; 4 marks. Your teacher reviews explanations and method marks.
P3 has no mark.

P1

Find 35% of £80, showing a method. [2]

P2

Three quarters of a quantity is 18 kg. Find the whole and check. [2]

P3

Name one decision you can now explain. Set a fresh question and a date for checking it without support.

Teacher feedback: _____

Fresh question and retry date: _____

Delayed independent evidence: _____

Prepare for the next lesson

L011: Percentage change and reverse percentages

F1

Tomorrow find 15% of 120 and $\frac{2}{3}$ of 45.

F2

Before L011, a £50 price rises by 10%. Find the rise and the new price.

Read and prepare

For a percentage increase, retain 100% and add the change. A 10% rise uses multiplier 1.10; a 10% fall uses 0.90. Recovering an original amount reverses this multiplier.

Digital workbook: save locally where available; export a JSON backup before closing or moving the file. Restore only this lesson/version. Printing records answers, not mastery. Live browser checks remain pending; use Word/PDF if required.

Optional extension activities

Stretch

Find 35% of £240 using 10%, 5% and a combination.

Deep challenge

A class has 18 of 24 learners present. Express attendance as a simplified fraction and percentage.

Recall & Review: feedback and extension integration

Source-integrated WWW/EBI and extension page

Lesson L010: Fractions and percentages of amounts

Objective: Use fractions and percentages as operators, recover a whole from a known fraction, and explain the chosen reference amount.

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: Find 35% of £240 using 10%, 5% and a combination.

Deep challenge: A class has 18 of 24 learners present. Express attendance as a simplified fraction and percentage.

My next-step response
