

Year 7 - Unit 13: Proportion Problems

Learning Journey:

Prior Learning

- Simplify ratios and use equivalent ratios to find missing values.
- Multiply and divide confidently using whole numbers, fractions and decimals.

Next Steps

- Solve direct and inverse proportion problems using equations and graphs.
- Apply proportional reasoning to similarity, rates of change and GCSE problem-solving.



By the end of this unit, you should be able to:

- Solve proportion problems by scaling quantities up and down.
- Use proportional reasoning to solve real-life problems involving recipes, maps and measures.

Keywords:

Proportion – A relationship where two quantities have the same ratio.

Scale factor – The number used to enlarge or reduce a quantity.

Equivalent ratio – A ratio with the same value but different numbers.

Unitary method – Finding the value of one unit first.

Scale – The relationship between a model or drawing and the real object.

Constant of proportionality – The fixed multiplier linking two proportional quantities.

Proportional Problems

If two quantities are **directly proportional**, then as **one increases** the other **also increases** at the same rate (proportionally), e.g. as one doubles, the other one also doubles.

Example: Jeremy uses **400 g** of flour to make **8** muffins. How much flour would he need to make **30** muffins?

Step 1: Divide the amount of flour by 8 to find the value of flour for 1 muffin.

$$400 \div 8 = 50 \text{ g of flour.}$$

Step 2: Multiply the amount of flour needed for 1 muffin by the **30** muffins needed.

$$30 \times 50 = 1500 \text{ g of flour.}$$

Example 2: Katie is baking a cake. The recipe calls for the following:

- 525 g of flour
- 475 g of sugar
- 225 g of butter
- 15 eggs

Katie uses **210 g** of flour in her cake.
Find how much of the other ingredients she uses.

First, find the scale factor:

$$210 \div 525 = 0.4$$

Next, multiply the scale factor by the amounts of each ingredient.

Sugar: $475 \times 0.4 = 190 \text{ g}$

Butter: $225 \times 0.4 = 90 \text{ g}$

Eggs: $15 \times 0.4 = 6 \text{ eggs}$