

Year 8 - Unit 1: Percentages

Learning Journey:

Prior Learning

- Convert fluently between fractions, decimals & percentages & calculate simple fractions of amounts
- Perform calculations involving money, decimals, multiplication and division, including using a calculator accurately.

Next Steps

Finding the midpoint between two coordinates.
Finding the length of a line segment between two coordinates.

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

- Calculate percentages of amounts & solve percentage increase & decrease problems using both calculator & non-calculator methods.
- Apply percentage reasoning to real-life contexts.

Keywords:

Percentage – A number expressed out of 100

Multiplier – A decimal used to increase or decrease by an amount

Original amount – the starting value before any change

Value for money – comparing prices to find the best deal.

VAT – Value Added Tax

Appreciate – When a value increases over time.

Depreciate – When a value decreases over time.

Percentage of an amount without a calculator

To calculate the **percentage of an amount**, we convert the percentage to a fraction and then multiply this by the amount.

Example: Calculate 16% of 60

It is better to split 16% into amounts that are easier to work out such as 10%, 5%, and 1%

$$\begin{aligned} 10\% \text{ of } 60 &= 6, & 5\% \text{ of } 60 &= 3 & 1\% \text{ of } 60 &= 0.6 \\ 16\% &= 10\% + 5\% + 1\% \\ &= 6 + 3 + 0.6 = 9.6 \end{aligned}$$

Percentage of an amount with a calculator

To calculate the **percentage of an amount**, we convert the percentage to a decimal and then multiply this by the amount.

Example: Calculate 16% of 60

We need to multiply 16% as a decimal by 60

$$0.16 \times 60 = 9.6$$

Percentage Increase/Decrease

For a **percentage increase**, take 100% and add your percentage to this. Then divide by 100 to make it into a decimal.

For a **percentage decrease**, take 100% and subtract your percentage to this. Then divide by 100 to make it into a decimal.

Increase 400 by 65%

$$400 \times 1.65 = 660$$

Decrease 400 by 65%

$$400 \times 0.35 = 140$$

Non-Calculator

Increase 400 by 65%

$$10\% \text{ of } 400 = 40$$

$$60\% \text{ of } 400 = 240$$

$$5\% \text{ of } 400 = 20$$

$$65\% \text{ of } 400 = 260$$

$$400 + 260 = 660$$

Shapes In Coordinate Systems

Offer A	Offer A
2kg of pasta	1.5kg of pasta
£4.40	£3.60

In this example we are told that 2kg of pasta £4.40 and 1.5kg of pasta £3.60.

For the unitary method, this is the price of a single item so will calculate the price of 1kg of pasta for each deal.

Offer A
 $£4.40 \div 2 = £2.20$
Each kilogram of pasta costs £2.20

Offer B
 $£3.60 \div 1.5 = £2.40$
Each kilogram of pasta costs £2.40

Offer A is better value as £2.20 per kilogram of pasta is cheaper than £2.40 per kilogram of pasta.