Finding Percentages of Quantities

Starter

1. **(Review of last lesson)** Convert $\frac{5}{12}$ to a percentage.

2. **(Review of last lesson)** Convert 36% to a fraction.

3. Find: (a) $\frac{3}{4}$ of £36 (b) $\frac{2}{3}$ of 72 kg

4. Complete this table of common percentages and their fraction equivalents.

Percentage	20%	25%	$33\frac{1}{3}\%$	40%	50%	60%	$66\frac{2}{3}\%$	75%	80%
Fraction									

Notes

Explain how we find 18% of £37 without using a calculator and with using a calculator.

Non-calculator —chunking method

It is easy to find multiples of $10\,\%$ and $5\,\%$, $1\,\%$ and $2\,\%$.

$$10\,\% = £3.70$$
$$5\,\% = £3.70 \div 2 = £1.85$$
$$1\,\% = £0.37$$
$$2\,\% = 2 \times £0.37 = £0.74$$
$$18\,\% = £3.70 + £1.85 + £0.74 + £0.37 = £6.66$$

Calculator — fractional multiplier

$$18\,\% \equiv \frac{18}{100}$$
$$\frac{18}{100} \times 37 = £6.66$$

Calculator — decimal multiplier

$$18\,\% \equiv 0.18$$
$$0.18 \times 37 = £6.66$$

E.g. 1 Write down which method you would choose to do the following and show the calculation:
(a) Find 24% of 80. (b) Find 16.3% of 18796 m. (c) Find 75% of 24.

- Use chunking when the quantity is a small number or either the quantity or percentage ends in zero.
- Use decimal multiplier when you can use a calculator i.e. large quantities and/or difficult percentage.
- Use fractional multiplier when the percentage is a recognisable fraction

E.g. 2 Use the decimal multiplier method with your calculator to find:
(a) $23\,\%$ of 75 kg (b) $6\,\%$ of 196 m (c) $2.9\,\%$ of £250

Working: (a) $23\,\%$ of $75 = 0.23 \times 75 = 17.25$ kg

E.g. 3 One day after buying a car, it loses 18% of its value. How much do you lose on a car costing £12000?

E.g. 4 In a sale, a cd player was reduced by 25%. If its old price was £48, how much do you save?

E.g. 5 What percentage of a quantity doubles its amount?

E.g. 6 Show by calculation that $40\,\%$ of $70 \equiv 70\,\%$ of 40. Write down other equivalent calculations.

Video: Percentage of an amount (non-calc)
Video: Percentage of an amount (calc)

Solutions to Starter and E.g.s

Exercise
p156 Ex 9.4 Qu 1ace…, 2ace, 3-10 (non-calculator - fractional multiplier or chunking method)

Summary
Find 18% of …
Chunking method: find 10%, 1%, 2%, 5%

Fractional multiplier: $\frac{18}{100} \times \ldots$

Decimal multiplier: $0.18 \times \ldots$

Textbook answers (only available during a lockdown)