

Fractions, decimals, percentages, ratio and proportion

As outcomes, Year 8 pupils should, for example:

Use vocabulary from previous year and extend to: direct proportion...

Solve simple problems involving direct proportion.

For example:

- 5 miles is approximately equal to 8 km.
Roughly, how many km are equal to 20 miles?
Roughly, how many miles are equal to 24 km?
1 mile $\approx \frac{8}{5}$ km
20 miles $\approx \frac{8}{5} \times 20$ km = 32km
- 8 pizzas cost £16.
What will 6 pizzas cost?
- 6 stuffed peppers cost \$9.
What will 9 stuffed peppers cost?

Link to problems involving proportion (pages 4–5).

Use a **spreadsheet** to explore direct proportion.
For example:

	A	B	
1	No. of peppers	Cost (£)	
2	1	=0.45*A2	
3	2	=0.45*A3	
4	3	=0.45*A4	
5	4	=0.45*A5	
6	5	=0.45*A6	

	A	B	
1	£	\$	
2	10	=1.62*A2	
3	20	=1.62*A3	
4	30	=1.62*A4	
5	40	=1.62*A5	
6	50	=1.62*A6	

Link to conversion graphs (pages 172–3, 270–1), graphs of linear relationships (pages 164–5), and problems involving ratio and proportion (pages 4–5).

As outcomes, Year 9 pupils should, for example:

Use vocabulary from previous years and extend to: proportionality, proportional to... and the symbol \propto (directly proportional to).

Identify when proportional reasoning is needed to solve a problem. For example:

- A recipe for fruit squash for six people is:

300 g	chopped oranges
1500ml	lemonade
750ml	orange juice

Trina made fruit squash for ten people.
How many millilitres of lemonade did she use?

Jim used 2 litres of orange juice for the same recipe.
How many people was this enough for?

Link to problems involving proportion (pages 4–5).

Use a **spreadsheet** to develop a table with a constant multiplier for linear relationships. Plot the corresponding graph using a **graph plotter** or **graphical calculator**.

Understand and use proportionality. Use
 $y \propto x$ $y \propto x^2$ $y \propto 1/x$
 to explore relationships between variables.

Use a **spreadsheet** to test whether one set of numbers is directly proportional to another, e.g.

	A	B	C	D	E	F	G	H	
1	No. of litres	1	2	3	4	5	6	7	
2	Price (p)	91	182	273	364	455	546	637	
3	Price/litres	=B2/B1	=C2/C1	=D2/D1	=E2/E1	=F2/F1	=G2/G1	=H2/H1	

Plot the corresponding graph using a **graph plotter**.

Compare with a non-linear relationship, such as
 area of square = (side length)²

Use proportionality in other contexts. For example, from science know that pressure is proportional to force and weight is proportional to mass.

Appreciate that some 'real-life' relationships, particularly in science, may appear to be directly proportional but are not. For example, consider:

- A plant grows 5 cm in 1 week.
How much will it grow in 1 year?
- A man can run 1 mile in 4 minutes.
How far can he run in 1 hour?

Link to graphs of functions (pages 170–1).