



Essential Knowledge	Teaching Points
<ul style="list-style-type: none"> Understand and express the division of a quantity into a of number parts as a ratio; Write ratios in their simplest form; Write/interpret a ratio to describe a situation; Share a quantity in a given ratio including three-part ratios; Solve a ratio problem in context: <ul style="list-style-type: none"> use a ratio to find one quantity when the other is known; use a ratio to compare a scale model to a real-life object; use a ratio to convert between measures and currencies; problems involving mixing, e.g. paint colours, cement and drawn conclusions; Compare ratios; Write ratios in form $1 : m$ or $m : 1$; Write a ratio as a fraction; Write a ratio as a linear function; Write lengths, areas and volumes of two shapes as ratios in simplest form; Express a multiplicative relationship between two quantities as a ratio or a fraction. Understand and use proportion as equality of ratios; Solve word problems involving direct and inverse proportion; Work out which product is the better buy; Scale up recipes; Convert between currencies; Find amounts for 3 people when amount for 1 given; Solve proportion problems using the unitary method; Recognise when values are in direct proportion by reference to the graph form; Understand inverse proportion: as x increases, y decreases (inverse graphs done in later unit); Understand direct proportion relationship $y = kx$. 	<ul style="list-style-type: none"> Emphasise the importance of reading the question carefully Include ratios with decimals 0.2:1. It is also useful for students to know rough metric equivalents of commonly used imperial measures, such as pounds, feet, miles and pints Students must recognise that two paints mixed red to yellow 5:4 and 20:16 follow the same colour order and are equivalent. Students will need to comfortable with writing a ratio to describe a situation such as 1 blue for every 2 red, or 3 adults for every 10 children. Students should express statements in a favourite of ways eg 'There are twice as many girls as boys' can be written as the ratio 2:1 or the linear function $y = 2x$, where x is the number of boys and y is the number of girls Emphasise the link between scatter graphs and direct/inverse proportion.
Assumed Prior Knowledge/ Links / Interleaving	
<ul style="list-style-type: none"> Students should know the four operations of number. Students should have a basic understanding of fractions as being 'parts of a whole'. 	

Potential Barriers to Access / Misconceptions	Opportunities for Reasoning/Problem Solving/Proofs
<ul style="list-style-type: none"> • Students find three-part ratios difficult. • Using a ratio to find one quantity when the other is known often results in students 'sharing' the known amount. 	<ul style="list-style-type: none"> • Problems involving sharing in a ratio that include percentages rather than specific numbers, such as: In a youth club the ratio of the number of boys to the number of girls is 3:2. 30% of the boys are under the age of 14, and 60% of the girls are under the age of 14. What percentage of the youth club is under the age of 14? • Problems in context, such as scaling a recipe, or diluting lemonade or chemical solutions, will show how proportional reasoning is used in real-life contexts • Find out/prove whether two variables are in direct proportion by plotting the graph and using it as a model to read off other values. • Ensure students can identify the difference between direct and inverse proportion eg If it takes 2 builders 10 days to build a wall, how long will it take 3 builders?
Key Mathematical Vocabulary	Ratio, proportion, share, parts, fraction, function, direct proportion, inverse proportion, graphical, linear, compare