



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

<b>Potential Barriers to Access / Misconceptions</b>	<b>Opportunities for Reasoning/Problem Solving/Proofs</b>
<ul style="list-style-type: none"> <li>• Students find three-part ratios difficult.</li> <li>• Using a ratio to find one quantity when the other is known often results in students 'sharing' the known amount.</li> </ul>	<ul style="list-style-type: none"> <li>• 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?</li> <li>• 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</li> <li>• 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.</li> <li>• 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?</li> </ul>
<b>Key Mathematical Vocabulary</b>	Ratio, proportion, share, parts, fraction, function, direct proportion, inverse proportion, graphical, linear, compare