The Sutton Academy

Knowledge Rich Curriculum Plan

Year 10 Higher - Ratio and Proportion

Lesson	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success:	Feedback
To learn how to share an amount into a ratio.	•Students will know how to share a quantity into a two-part given ratio. •Students will know how to share a quantity into a three-part given ratio. •Students will know how to find quantities within a ratio when the difference between two parts is given. •Students will know how to solve ratio problems with context. •Students will know how to solve more complex ratio problems including those which involve percentages and fractions.	Ratio - a way of representing the relationship between two amounts Share – split up between parts	•Students will know how to simplify ratios in their simplest form. •Students will know how to simplify ratios in the form of 1 : n or n : 1.	**Steps to Success – Sharing an amount into a ratio** **Step 1:** Represent the parts of the ratio in the form of boxes – remember to assign the ratio in the order of the question. **Step 2:** Count the number of the part. Divide the total amount by the number of parts. This will give you the amount that each part is worth. **Step 3:** Write the value of each part within the box. **Step 4:** Calculate the totals for each section of the ratio. **Step 5:** Check that you have answered the question. You may only need to state one amount rather than every amount. **Steps to success: Ratio - Given one quantity** **Step 1:** Represent the parts of the ratio in the form of boxes – remember to assign the ratio in the order of the question. **Step 2**: If you are given one value divide the amount by the number of parts for the person it is referring to. **Step 3:** Write the value of each part within the box **Step 4:** Calculate the totals for each section of the ratio. **Step 5:** Check if the question is asking for one value or for the total amount. **Steps to success: Ratio – Given the difference** **Step 1:** Represent the parts of the ratio in the form of boxes – remember to assign the ratio in the order of the question. **Step 2:** Count the **difference** in the number of the parts. Divide the difference by the difference in the number of parts. This will give you the amount that each part is worth. **Step 3:** Write the value of each part within the box. **Step 4:** Calculate the totals for each section of the ratio. **Step 5:** Check if the question is asking for one value or for the total amount.	
To learn how to solve harder ratio problems.	•Students will know how to combine ratios and use them for comparison between three parts. •Students will know how to combine ratio to express part of the ratio as a fraction. •Students will know how to combine ratios to share an amount into the new ratio. **Opportunity for challenge:** •Students will know how to solve ratio problems involving algebraic terms.	Combine – merge together	•Students need to know how to find the LCM of two numbers.	**Steps to Success - Combining ratios** **Step 1:** Identify the common element between the two ratios. **Step 2:** Find the LCM of the two parts that are in common. **Step 3:** Multiply both ratios in order to make the parts in common equal. **Step 4:** Combine the two ratios, simplify if possible. **Step 5:** Check if the question is asking to share between the combined ratio, the simplified combined ratio or a different ratio.	
To learn how to solve real life problems involving direct and inverse proportion.	• Students will know how to find the best value for money between 2 or 3 given values. • Students will know how to find the best value for money where a conversion in money is needed. E.g. One given in pounds and one given in pence. • Students will know how to find the best value for money where a conversion in the amount is needed. E.g. One is given in ml and one in litres. • Students will know how to find the best value for money in more complex scenarios where percentage discounts or fractions are also involved. • Students will know how to convert between different currencies.	Value – how much money something is worth Currency – a system of money in general use in a particular country Convert – change a value from one form to another Direct Proportion –if one number increases, then so	• Students will need to know how to find the LCM of two numbers. • Students need to know how to multiply and divide decimals.	**Steps to Success – The best value for money** **Method 1 – Finding the price of one item** **Step 1:** Divide the cost by the amount. You must show all of your working. **Step 2:** Write down the full answers and do not round anything. **Step 3:** Pick the smallest value. **Step 4:** Remember to write the name of the item that is the best value for money. **Method 2 – Finding the LCM of each item** **Step 1:** Find the lowest common multiple of each quantity. Write down all of your working. **Step 2:** Multiply the cost of each item in order to get the LCM quantity of each item, this is so you can compare. **Step 3:** Pick the smallest value.	

Lesson	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success:	Feedback
	• Students will know how to solve problems involving the conversion of different currencies. • Students will know how to solve real life problems involving direct proportion including money problems. • Students will know how to solve real life problems involving inverse proportion without using algebra (e.g. number of worker problems etc.).	does the other or if one decreases then so does the other **Inverse** – Opposite **Inverse Proportion –** if one number increases, then the other number decreases or vice versa **Cultural capital**		**Step 4:** Remember to write the name of the item that is the best value for money. **Steps to Success – Currency conversion** **Step 1:** Highlight the exchange rate given in the question. **Step 2:** Establish which way you are using the exchange rate. Are you going to multiply or divide? **Step 3:** Carry out the calculation. **Steps to Success - Direct Proportion** **Step 1:** Divide each value by the number of items that is equal to it. This will get the value for 1 person/item. **Step 2:** Multiply the amount for 1 person/item by the amount you need. **Steps to Success - Inverse Proportion** **Step 1:** Multiply each value by the number of items that is equal to it. This will get the time for 1 worker/machine. **Step 2:** Divide the time for 1 worker/machine by the amount you need. **Double check that your answer makes sense for what is being asked.**	
To learn how to solve algebraic direct proportion problems.	• Students will know how to set up a direct proportion equation. • Students will know how to find the constant of proportion. • Students will know how to use the equation of direct proportion to find other values. • Students will know how to solve algebraic direct proportion problems involving powers and roots. **Opportunity for challenge:** • Students will know how to solve algebraic direct proportion problems where two equations are needed.	**Constant** – a quantity that does not change its value	• Students need to know how to substitute numbers into formulae. • Students need to know how to solve linear equations involving squares and roots.	**Steps to Success – Algebraic direct proportion** If y is directly proportional to x, this can be written as $y \propto x$ An equation of the form $y = kx$ represents direct proportion, where k is the **constant of proportionality**. **Step 1:** Write out the equation y = kx, attaching the appropriate power to the 'x' and using the **variables** given in the question. **Step 2: Substitute** in the given values. **Step 3: Solve** the resulting **equation** to find k. **Step 4:** Rewrite the equation with the value for k. **Step 5:** Substitute in the given value to find the missing variable the question asks for.	
Exam Preparation 7					