The Sutton Academy

Knowledge Rich Curriculum Plan

Year 10 Intermediate – Percentages

Lesson	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success:	Feedback
To learn how to solve problems involving percentages using a calculator.	• Students will know how to express a percentage of amounts, increases or decreases as a multiplier. • Students will know how to find a percentage of an amount by a percentage using a calculator and a multiplier. • Students will know how to increase an amount by a percentage using a calculator and a multiplier. • Students will know how to decrease an amount by a percentage using a calculator and a multiplier. • Students will know how to solve more complex worded problems involving fractions and percentages using a calculator. • Students will be able to calculate simple interest using a calculator. • Students will know how to solve problems involving simple interest. • Students will know how to express one number as a percentage of another, giving an integer answer with and without a calculator. • Students will know how to express one number as a percentage of another, giving a decimal answer with and without a calculator. • Students will know how to solve worded/real-life problems by expressing one number as a percentage of another.	**Multiplier** – a value in which another term is multiplied	• Students need to know how to convert percentages to decimals. • Students need to know how to express one number as a fraction of another.	**Steps to Success- Percentage of amount using a calculator** **Step 1:** Calculate the multiplier by converting the percentage into a decimal. **Step 2:** Multiply the multiplier by the amount given in the question. **Steps to Success- Increase an amount using a calculator** **Step 1:** Add your percentage to 100% to find the actual percentage you need to find. **Step 2:** Calculate the multiplier by converting the percentage into a decimal. **Step 3:** Multiply the multiplier by the amount given in the question. **Step 4:** Check your answer makes sense. It should be bigger than the original number. **Steps to Success- Increase an amount using a calculator** **Step 1:** Subtract your percentage from 100% to find the actual percentage you need to find. **Step 2:** Calculate the multiplier by converting the percentage into a decimal. **Step 3:** Multiply the multiplier by the amount given in the question. **Step 4:** Check your answer makes sense. It should be smaller than the original number. **Steps to Success- Simple Interest** **Step 1:** Begin calculating the percentage of the original amount. **Step 2:** Multiply this amount by the number of years the interest has been applied for. **Step 3:** Check what the question wants: • If you need to find only how much interest was gained, you have your answer. • If you need to find the total after the interest is applied, add the amount gained from simple interest to the original amount. **Steps to success- Expressing a number as a percentage of another number** **Step 1:** Write the given number as a fraction of the total. **Step 2:** When possible find an equivalent fraction with a denominator of 100 – you can then write your percentage straight away as all percentages are out of 100. If this is not possible then go straight to step 3. **Step 3:** Divide the numerator by the denominator using short division if necessary. This will give you a decimal. **Step 4:** Convert the decimal into a percentage by multiplying it by 100.	
To learn how to calculate percentage change.	• Students will know how to calculate the value of a profit or loss and use it to determine percentage profit or loss. • Students will know that $percentage\ profit = \frac{profit}{expense} \times 100$ • Students will know that $percentage\ loss = \frac{loss}{expense} \times 100$ • Students will know how to calculate percentage change with and without a calculator. **Opportunity for challenge:** • Students will know how to solve real-life problems involving percentage change.	**Profit –** a financial gain, the difference between the amount earned and the amount spent in buying, operating or producing something **Expense –** the cost incurred in or required for something	• Students will need to know how express one number as a percentage of another.	**Steps to Success- Percentage Change** Both profit and loss can follow the same formula: **Step 1:** Identify the change by subtracting the smaller amount from the greater amount. **Step 2:** Identify the original cost or expense. **Step 3:** Substitute into the following formula: $$Percentage\ change = \frac{change}{original\ cost\ or\ expense} \times 100$$	

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To learn how to solve problems involving reverse percentages.	• Students will know how to find the original amount given the final amount after a percentage increase or decrease (reverse percentages). • Students will know how to find the original amount using reverse percentages with and without a calculator. • Students will know how to recognise when they need to use reverse percentages. **Opportunity for challenge:** • Students will know how to solve real-life problems using reverse percentages including VAT.	**VAT – Value Added Tax** – a tax that is applied to the purchase price of certain goods, services and other taxable supplies that are bought and sold within the UK. Standard VAT is 20%.	• Students need to know how to solve basic direct proportion problems.	**Steps to Success - Reverse percentages** **Step 1:** There are 3 types of reverse percentage questions. Firstly, identify whether is an increased percentage, a decreased percentage or the same percentage. **Step 2:** • If the original amount has been reduced by a percentage subtract the percentage from 100%. • If the original amount has been increased by a percentage add the percentage to 100%. • If the original amount is equal to the percentage change then go to step 3. **Step 3:** Write this percentage equal to the new amount given in the question. **Step 4:** Divide to find 1%. **Step 5:** Multiply the answer by 100 to find 100%. **Step 6:** Check that the answer looks right. You can also check by calculating the increase/decrease with your answer.	
To learn how to calculate with compound interest and depreciation.	• Students will know how to calculate the compound interest of an amount. • Students will know how to calculate the compound depreciation of an amount. • Students will know how to calculate compound interest or depreciation of an amount using a calculator. • Students will know how to calculate the number of years needed to find a certain total value or interest. **Opportunity for challenge:** • Students will know how to solve a problem involving compound interest or depreciation.	**Interest -** a fee paid for borrowing money or an amount earned by saving money in a bank account that pays it **Compound Interest –** the interest on a loan or deposit that accrues on both the initial value and the accumulated interest from previous periods. **Depreciation –** a decrease in the value **Accumulated –** built up over time **Accrued –** received **Initial –** starting/original amount **Cultural Capital -Simple Interest Vs Compound Interest**	• Students need to know how to convert a percentage into a multiplier.	**Steps to Success – Compound interest** **Step 1:** Add the percentage to 100% and divide by 100 to find the multiplier. **Step 2:** Calculate the compound interest by filling in the calculation: $Original\ amount \times multiplier^n$ Where n is the number of years the money is invested for **Steps to Success – Compound depreciation** **Step 1:** Subtract the percentage from 100% to find the percentage multiplier. **Step 2:** Calculate the compound interest by filling in the calculation: $Original\ amount \times multiplier^n$ Where n is the period of time.	
Exam Preparation 4					