The Sutton Academy

Knowledge Rich Curriculum Plan

Year 9 Core – Percentages

Lesson objective	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success:	Feedback
To learn how to solve problems with percentages.	• Students will know how to calculate any percentage of an amount. • Students will know that you can find percentages several ways by using a mixture of multiplying, dividing, adding and subtracting the basic percentages (50%, 25%, 10%, 5% and 1%). • Students will know how to find the percentage of an amount using real-life problems. • Students will know how to find percentages of an amount using a calculator. Students will know how to increase an amount by a percentage • Students will know how to decrease an amount by a percentage. • Students will know how to increase or decrease an amount using percentages in real-life problems. • Students will know how to express a percentage increase or decrease using a multiplier. • Students will know how to increase an amount by a percentage using a calculator using a multiplier. • Students will know how to decrease an amount by a percentage using a calculator using a multiplier.	Increase – gets bigger Decrease – gets smaller	• Students need to know how to calculate percentages of amounts.	<u>How do we calculate Percentage Increase and Decrease without a Calculator?</u> **Step 1 -** Calculate the percentage of the amount **Step 2** – Increasing/Decreasing an amount by a Percentage When a question asks you to increase an amount by a given percentage, you add the percentage of the amount found onto the original value in the question. The answers should be larger than the original value in the question. When a question asks you to decrease an amount by a given percentage, you subtract the percentage of the amount found from the original value in the question. The answer should be smaller than your original value. <u>Steps to Success – Finding a Multiplier</u> • To find a basic multiplier divide the percentage by 100. e.g. 50% = 50/100 = 0.5 • To find an increase multiplier add the percentage to 100 and then divide by 100 • To find a decrease multiplier subtract from 100 and then divide by 100 <u>Steps to Success- Increase/decrease an amount using a calculator</u> **Step 1:** If decrease subtract your percentage from 100% to find the actual percentage you need to find. If an increase add the percentage to 100% to find the 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 for decrease/ larger than the original amount for increase.	
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 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 Expense – the cost incurred	• Students need to know how to express numbers as a percentage of another. IF STUDENTS GET THIS WRONG IT NEEDS TO BE ADDRESSED IN THE PRIOR KNOWLEDGE CONSOLIDATION.	<u>Steps to Success</u> – <u>Percentage Change</u> **Step 1** – Calculate the difference between the original value and the new value. **Step 2** – Express the difference as a fraction over the original value. **Step 3** – Multiply the fraction by 100. Students will know that $percentage\ profit = \frac{profit}{expense} \times 100$ Students will know that $percentage\ loss = \frac{loss}{expense} \times 100$	
To learn how to use reverse percentages	• Students will know how to find the original amount given the final amount after a		• Students need to know how to multiply and divide integers.	<u>Step to Success - How do we solve problems involving reverse percentages?</u>	

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	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.			**Step 1:** 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 amount is equal to, write it as equal to. **Step 2:** Write this percentage equal to the reduced/increased amount. **Step 3:** Divide to find 1%. **Step 4:** Multiply the answer by 100 to find 100%. **Step 5:** Double check you've answered the question and that there isn't anything else you need to do.	
To learn how to calculate simple interest.	• Students will know that value added tax, or VAT, is the tax you have to pay when you buy goods or services. • Students will know that the standard rate of VAT in the UK is 20%. • Students will know how to calculate VAT. • Students will know how to find simple interest by finding the value of the increase, multiplying by the amount of years and adding it to the original amount. • Students will know how to calculate simple interest with and without a calculator. • Students will know how to solve problems involving simple interest.	**Cultural Capital -Simple Interest Vs Compound Interest** **Interest -** a fee paid for borrowing money or other assets or an amount earned by saving money in a bank account that pays it **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 increase amounts using percentages. • Students need to know how to use a calculator to find percentages.	**<u>Steps to success- Simple Interest</u>** **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.	This should be in the percentage increase and decrease lesson?
To learn how to calculate compound interest.	• Students will know the difference between simple of compound interest. • 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. **Opportunity for challenge:** • Students will know how to solve a problem involving compound interest or depreciation.	**Compound Interest –** the interest on a loan or deposit that accrues on both the initial principal and the accumulated interest from previous periods. **Depreciation –** a decrease in the value **Accumulated –** built up over time **Accrued –** received **Initial –** starting/original amount **Annum –** year	• Students need to know how to increase and decrease amounts using percentages. • Students need to know how to calculate simple interest.	**How do we calculate with compound interest?** **Step 1:** Add the percentage to 100% and divide by 100 to find the **multiplier** **Step 2:** Calculate the compound interest by following the calculation: $$Original\ amount \times multiplier^{n}$$ Where n is the number of years the money is invested for **How do we calculate with compound depreciation?** **Step 1:** Subtract the percentage from 100% and divide by 100 to find the **multiplier** **Step 2:** Calculate the compound interest by following out the calculation: $$Original\ amount \times multiplier^{n}$$ Where n is the number of years or period of time.	

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To consolidate understanding of percentages.	• Students will know how to express one number as a percentage of another. • Students will know how to calculate percentages of amounts. • Students will know how to calculate percentage increase and decrease. • Students will know how to calculate reverse percentages. • Students will know how to calculate simple interest. • Students will know how to calculate compound interest and depreciation.		• Students need to know how to convert FDP	**Use steps from previous lessons**	I don't see the point of these. The mini assessment is the purpose of this.
Mini-Assessment 4					