

# PERCENTAGES 1

<b>Keywords:</b>	Percentage / conversion / multiplier / equivalent /				
<b>Definition / Description:</b>	<b>Percentage:</b> number of parts per 100.	<b>Conversion:</b> To change from one form to another	<b>Multiplier:</b> a number which is used to calculate a percentage of an amount or used to increase or decrease by a percentage	<b>Equivalent:</b> quantities that have the same value but are in different forms	
<b>Knowledge points:</b>	<b>Percentage of Amount Non Calculator Methods:</b> Using combinations of 10% / 50% / 25% / 1% to find percentages	<b>Percentage of Amount Calculator methods:</b> Use decimal multipliers to work out percentages	<b>Increase by a Percentage:</b> If you start with a given amount (100%) and you increase it by x% / then you will end up with (100 + x)% of the original amount.	<b>Decrease by a Percentage:</b> if you start with a given amount (100%) and you decrease it by x% / then you will end up with (100 – x)% of the original amount.	<b>Express one number as a percentage of another</b>
<b>Knowledge point examples:</b>	<p>Key non calculator Percentages Examples</p> <p>1. Work out 30% of 155.</p> <p>30% = 3 x 10%            10%: 155 ÷ 10 = 15.5            30%: 15.5 × 3 = 46.5            30% of 155 = <b>46.5</b></p> <p>2. Calculate 14% of 200</p> <p>14% = 10% + 4 x 1%            10%: 200 ÷ 10 = 20            1%: 200 ÷ 100 = 2            4%: 2 × 4 = 8            14%: 20 + 8 = 28            14% of 200 = <b>28</b></p>	<p>1. Convert percentages to a decimal by dividing by 100.</p> <p>2. Multiply amount by decimal</p> <p><u>Example:</u>            1. Calculate 40% of 120.  <math>40\% = \frac{40}{100} = 0.4</math>  <math>0.4 \times 120 = \mathbf{48}</math></p> <p>2. Calculate 25.5% of £470</p> <p>25.5% = 0.255  <math>0.255 \times 470 = \mathbf{£119.85}</math></p>	<p>Example:</p> <p>To increase £150 000 by 20% we need to find 120% (100+20%) of £150 000.            Converting to a multiplier  <math>120\% \text{ of } £150\,000 = 1.2 \times £150\,000 = \mathbf{£180\,000}</math></p>	<p>Example:</p> <p>To decrease £75 by 30% we need to find 70% (100-30%) of £75.            Converting to a multiplier /  <math>70\% \text{ of } £75 = 0.7 \times £75 = \mathbf{£52.50}</math></p>	<p>Example:</p> <p>There are 25 sweets in a bag. 6 of the sweets are orange flavour. What percentage of sweets are orange flavour?</p> <p>1. Write the proportion of orange sweets as a fraction.</p> <p>6 out of 25 = <math>\frac{6}{25}</math></p> <p>2. Convert the fraction to a percentage.</p> <p><math>\frac{6}{25} \times 100 = \frac{6 \times 100}{25} = 24\%</math></p>
<b>Linked Knowledge Maps</b>	Fractions / Place Value Decimals Rounding / Estimation Bounds / FDP conversion				

# PERCENTAGES 2

<b>Keywords:</b>	Percentage / multiplier / growth / interest / profit & loss / per annum					
<b>Definition / Description:</b>	<b>Percentage:</b> 'out of every 100'	<b>Multiplier:</b> A decimal equivalent of a percentage	<b>Growth:</b> an exponential increase	<b>Interest:</b> The cost of borrowing money	<b>Profit &amp; loss</b>	<b>Per annum:</b> Per year
<b>Knowledge points:</b>	Simple Interest Calculate simple interest of amounts		Compound Growth and Decay Compound Interest and Depreciation		Reverse Percentage Finding the original amount ( 100%)	Percentage Change Calculating the increase and decrease percentage
<b>Knowledge point examples:</b>	<div style="background-color: #FFDAB9; padding: 10px; margin-bottom: 10px;"> <math display="block">I = \frac{P \times R \times T}{100}</math> </div> <p>           I = Interest            R = rate of interest            P = Principal            T = time in years         </p> <p>Find the simple interest earned when £600 is invested for 2 years at an annual interest rate of 4%.</p> $I = \frac{60 \times 4 \times 2}{100} = \underline{\underline{\pounds 48}}$		<div style="background-color: #FFF9C4; padding: 10px; margin-bottom: 10px;"> <b>Formula:</b> <span style="float: right;">Time</span>  <math display="block">\text{Quantity} \times \text{Multiplier}</math> </div> <p><u>Compound Interest</u>            £8000 is invested at 7% compound interest for 6 years. Find: (a) the amount in the account at the end of the period (nearest £) and (b) the interest accrued (nearest £)</p> <p>a) <math>8000 \times 1.07^6 = \underline{\underline{\pounds 12\,006}}</math>            b) <math>12\,006 - 8000 = \underline{\underline{\pounds 4\,006}}</math></p> <p><u>Depreciation</u>            The value of a new car depreciates at a rate of 15% a year.            The car costs £24 000 in 2023            How much will it be worth in 2031?            To decrease the value by 15% we multiply it by 0.85.            There are 8 years between 2023 and 2031            After 8 years the value of the car will be <math>\underline{\underline{\pounds 24\,000 \times 0.85^8 = \pounds 6540}}</math> (to the nearest £)</p>		<ol style="list-style-type: none"> <li>Find the percentage multiplier</li> <li>Divide the amount by the percentage multiplier</li> </ol> <p>I invested some money in the bank and got 45% interest. At the end of the year I had £652.50. How much did I put in the bank?</p> <div style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;"> <math display="block">\begin{array}{ccc} &amp; \times 1.45 &amp; \\ \swarrow &amp; &amp; \searrow \\ 100\% &amp; &amp; 145\% \\ \swarrow &amp; &amp; \searrow \\ \pounds 450 &amp; &amp; \pounds 652.50 \\ \nwarrow &amp; &amp; \nearrow \\ &amp; \div 1.45 &amp; \end{array}</math> </div> <p>A pair of jeans were 40% off and cost £54. How much were they before the sale?</p> <div style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;"> <math display="block">\begin{array}{ccc} &amp; \times 0.6 &amp; \\ \swarrow &amp; &amp; \searrow \\ 100\% &amp; &amp; 60\% \\ \swarrow &amp; &amp; \searrow \\ \pounds 90 &amp; &amp; \pounds 54 \\ \nwarrow &amp; &amp; \nearrow \\ &amp; \div 0.6 &amp; \end{array}</math> </div>	<div style="background-color: #FFF9C4; padding: 10px; margin-bottom: 10px;"> <math display="block">\text{Percentage change} = \frac{\text{Change in value}}{\text{Original value}} \times 100</math> </div> <p>Last year Hazel had £3200 in her bank account. She now has £3360 despite not having paid in any money. Calculate the rate of interest on her account.</p> <ol style="list-style-type: none"> <li>Calculate the change in value <math>3360 - 3200 = 160</math></li> <li>Divide the change in value by original amount. <math>160 / 3200 = 0.05</math></li> <li>Multiply by 100 to get % <math>0.05 \times 100 = 5</math></li> </ol> <p>The rate of interest on Hazel's account was 5%.</p>
<b>Linked Knowledge Maps</b>	Fractions / Place Value Decimals Rounding / Estimation Bounds / FDP conversion					