Percentages	Means ''out of 100''		**Simple interest**	Interested is calculated as a percentage of the original loan and the same amount added each time period.
Percentage increase	Calculate the percentage and add it on to the original		**Compound interest**	When interested is added at the end of the time period and interest on the following time period is calculated using the new amount (interest on the interest).
	Or use a multiplier	$\frac{100 + \%\ increase}{100}$		
Percentage decrease	Calculate the percentage and take it away from the original		**Percentage Loss**	$\frac{decrease}{original\ amount} \times 100$
	Or use a multiplier	$\frac{100 - \%\ decrease}{100}$	**Percentage Profit**	$\frac{increase}{original\ amount} \times 100$
Reverse Percentages	Original value x multiplier = new amount So original value = $\frac{new\ value}{multiplier}$			

Type 1 — Finding the percentage change

1) This is the formula for giving a change in value as a percentage — LEARN IT, AND USE IT:

$$\text{Percentage 'Change'} = \frac{\text{'Change'}}{\text{Original}} \times 100$$

2) You end up with a percentage rather than an amount.
3) Typical questions will ask 'Find the percentage increase/profit/error' or 'Calculate the percentage decrease/loss/discount', etc.

Type 2 — Finding the original value

EXAMPLE: A house increases in value by 10.5% to £132 600. Find what it was worth before the rise.

Note: The new, not the original value is given.

1) An increase of 10.5% means £132 600 represents 110.5% of the original value.
2) Divide by 110.5 to find 1% of the original value. (÷110.5)
3) Then multiply by 100. (×100)

£132 600 = 110.5%
£1200 = 1%
£120 000 = 100%

So the original value was £120 000

If it was a decrease of 10.5%, then you'd put '£132 600 = 89.5%' and divide by 89.5 instead of 110.5.

Simple Interest

Simple interest means a certain percentage of the original amount only is paid at regular intervals (usually once a year). So the amount of interest is the same every time it's paid.

EXAMPLE: Regina invests £380 in an account which pays 3% simple interest each year. How much interest will she earn in 4 years?

1) Work out the amount of interest earned in one year: 3% = 3 ÷ 100 = 0.03; 3% of £380 = 0.03 × £380 = £11.40
2) Multiply by 4 to get the total interest for 4 years: 4 × £11.40 = £45.60

Compound Growth and Decay

This topic is simple if you LEARN THIS FORMULA. If you don't, it's pretty well impossible:

$$N = N_0 \times (\text{multiplier})^n$$

- N: Amount after n days/hours/years
- N_0: Initial amount
- n: Number of days/hours/years

Percentage change multiplier
E.g. 5% increase is 1.05 (= 1 + 0.05)
26% decrease is 0.74 (= 1 – 0.26)

Linked prior topics
Percentage of amounts, Percentage multipliers, Percentage increase/decrease, Express one number as a percentage of another.

Vocabulary
Percentage change, simple interest, compound interest, growth and decay

Linked future topics
Solving percentage problems, proportion