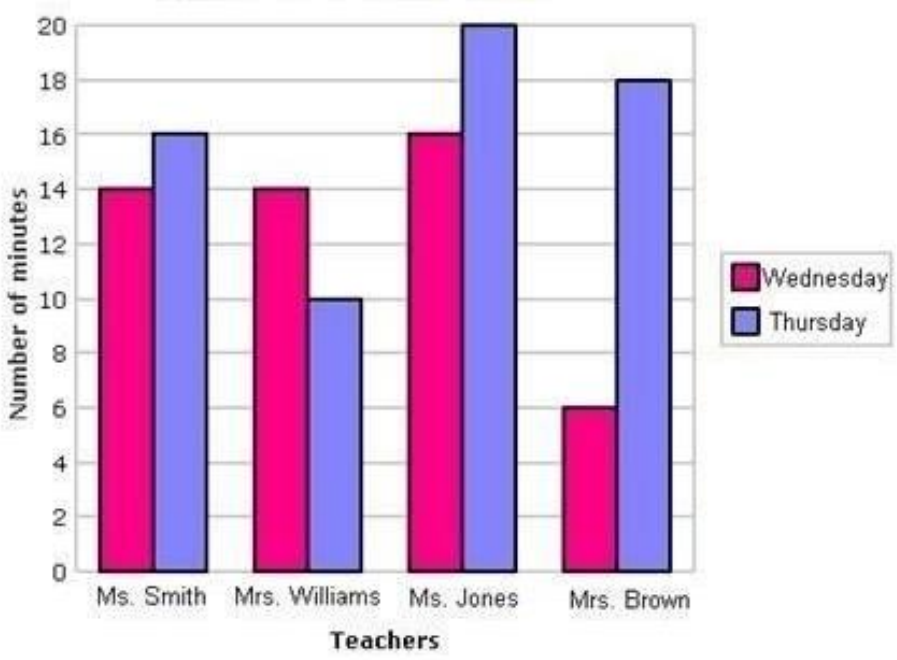
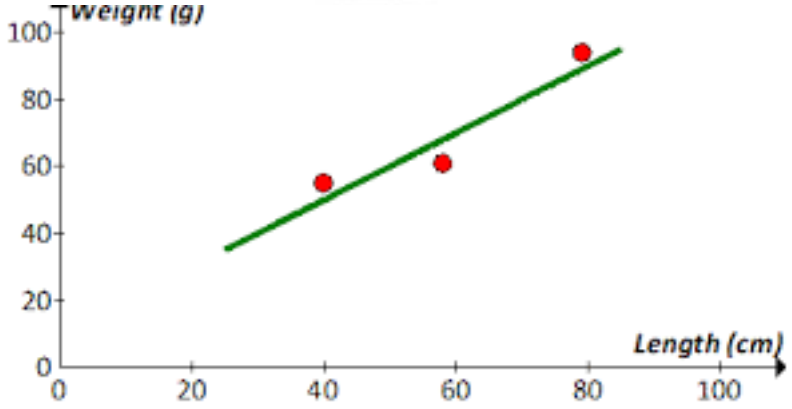
Control variable	Independent variable	Dependent variable
The variable that you keep the same each time you repeat an experiment.	The variable that you change within an experiment.	The variable that you measure within an experiment.





Components of a good graph in Science	
Bar graph	**Line graph**
Labelled X & Y Axis	
Appropriate scale (numbers)	
Points plotted accurately.	
Title	
	Line or curve of best fit

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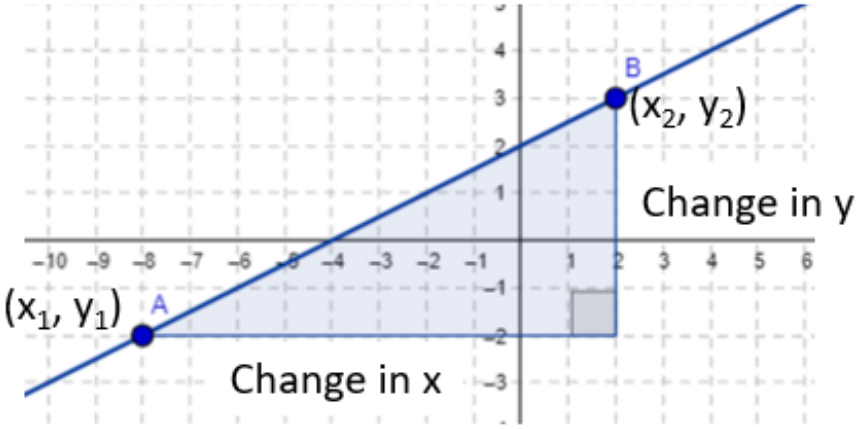
Gradient of a Straight Line



$$\text{Gradient} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{Change in y}}{\text{Change in x}}$$

Calculating percentage increase or decrease.

$$\text{Percent Increase} = \frac{\text{Final Value - Initial Value}}{\text{Initial Value}} * 100\%$$

$$\frac{(100°c - 50°c)}{50°c} = 100\%$$

What should an experimental plan contain…..

- Equipment
- Method (How you would use the equipment.)
- Variables
- Risk assessment

Control variable	Independent variable	Dependant variable
The variable that you keep the same each time you repeat an experiment.	The variable that you change within an experiment.	The variable that you measure within an experiment.

A risk assessment should include the following		
Hazard	Risk	Control
Something in the experiment that could harm someone. E.g. Acid	How to object could harm someone. E.g. Get into someone eye and damage it.	How to plan to control this. E.g. Ensure goggles are worn at all times.

A **balanced chemical equation** represents a chemical reaction using the formulae of the **reactants** and **products**. It shows the **number** of units of each substance involved.

Balancing an equation

The law of **conservation of mass** states that no **atoms** are lost or made during a chemical reaction, so the total **mass** of the **products** is equal to the total mass of the **reactants**.

A balanced symbol equation has the same number of atoms of each **element** on both sides of the arrow. To balance an equation, add numbers to the left of one or more formulae.

Step	Result
Check to see if there are an equal number of atoms of each element on both sides. There aren't.	$N_2 + H_2 \rightarrow NH_3$
There are two nitrogen atoms on the left but only one on the right, so put a big 2 on the left of the NH_3.	$N_2 + H_2 \rightarrow 2NH_3$
Check again. There are two hydrogen atoms on the left but (2 × 3) = 6 on the right, so put a big 3 in front of the H_2.	$N_2 + 3H_2 \rightarrow 2NH_3$
Check again to see if there are equal numbers of each element on both sides. There are.	(Two nitrogen atoms and six hydrogen atoms)
Add the state symbols if asked to do so.	$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

State symbol	Meaning
(s)	Solid
(l)	Liquid
(g)	Gas
(aq)	Aqueous solution *(dissolved in water)*

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