ELECTRICITY & ELECTRIC CIRCUITS



Atom

Before getting into electricity, we need to review that fundamental unit of matter: The atom.

Remember that atoms are made of a nucleus packed with Protons (positive charge) and Neutrons (neutral charge), and orbited by a cloud of much smaller electrons (negative charge).

When electrons jump from one atom to another it is called <u>electricity</u>.

Forms of Electricity

 Occurs when electric current flows through a conductor.



Current Electricity

 Occurs when electric charges build up on a surface and are released all at once.



Static Electricity

Current Electricity

In order for electric current to flow through a conductor, like a wire, you need two things:

- A power source to make the electricity flow, such as a battery.
- A complete path for the electric current to follow, called a circuit.



Source: http://www.bbc.co.uk/bitesize/ks3/science/energy_electricity_forces/electric_current_voltage/revision/2/

Circuit Symbols

Symbols are used to draw diagrams of circuits, just as we use symbols when we draw maps. This way you don't have to draw every piece of a circuit, you can just use the symbols instead.





Cell

Notice the difference here between a "cell" and a "battery"?

In physics (that's what you're studying by the way) we call a single regular battery a "cell" in electrical diagrams. Two or more cells put together are called a "battery".

So remember:





= Battery

Why use symbols? To make your diagram easy to both draw and read. Circuit Diagram



Types of Circuits

- Branches
- If one light goes out the other keeps working.



Parallel Circuit

- No branches
- If one light burns out the circuit is broken



Series Circuit

Series Circuit





In a series circuit, the lamps are placed one after another in a series.

When one lamp is broken the other light goes out because there is no longer a complete circuit from the battery to the lamp and back again.

Source: http://www.bbc.co.uk/bitesize/ks3/science/energy_electricity_forces/electric_current_voltage/revision/-

Parallel Circuit



As you can see, in a parallel circuit electricity will continue to flow through the wires even if one bulb is broken because it can still form a complete circuit from the battery to the working bulb and back again.

This is why our houses are wired with parallel circuits. After all, you wouldn't want every single light in your house to go out every time a single bulb broke would you?