# Electricity

- How & where it's used
- Review of the atom
- Overview of current and static electricity



Coulombs











# **Electricity!**

## **It's SHOCKING!**









What is electricity?

Where does it come from?

What do we use it for?

How would your life be different without it?

# Electricity

- Everything in the world is made up of atoms.
- Each atom is made of smaller parts. One of those parts is called an electron.
- Electrons can move from atom to atom.



## The Atom

Inside an atom, electrons have a negative charge and protons have a positive charge.



## The Atom

An atom is composed of proton(s), electron(s) and neutron(s)

Name	Mass	Charge	Location
Proton	1	+1	In the nucleus
Electron	Negligible	-1	Outside the nucleus
Neutron	1	0	In the nucleus

## We will be dealing with two types of electricity: Current and Static Electricity



**Electricity and Circuits** 



## **Current Electricity**

Type of electricity used in our homes.



A current will move along a wire or a path called a circuit.

Circuit means to "go around."

## Static Electricity

Static electricity is the charge that stays on an object.

Charges can then jump from one object to another

Static shocks e.g. Lightning



# ELECTRICAL CIRCUITS



## Drawing circuit diagrams

Called "schematic circuit diagrams"





## Parts of an Electric Circuit

Example **Copper wire** Light Switch Toaster **AA** battery



## Parts of an Electric Circuit

Example
Two or more =
battery

Light Bulb

Voltmeter

Ammeter



## **The CELL** The cell stores **chemical energy** and transfers it to

electrical energy when a circuit is connected.





The cells chemical energy is used up pushing a current round a circuit.

# **Open vs. Closed Circuits**

A circuit can be described as either open or closed

Closed circuit: the circuit is operating and the current is flowing. The light switch is "on" and so are the lights.

Open circuit: The circuit is NOT operating.





## What is an electric current?

An electric current is a flow of microscopic particles called **electrons** flowing through wires and components.



In which direction does the current flow?

## **Types of circuits**

### There are two types of electrical circuits;

#### **SERIES CIRCUITS**

### **PARALLEL CIRCUITS**



## **SERIES CIRCUITS**



The components are connected end-to-end, one after the other.

They make a simple loop for the current to flow round.



The components are connected side by side.

If one bulb 'blows' there is still a complete circuit so the other bulb will stays alight.

## **KEY TERM - CURRENT**

The flow of electricity around a circuit is called CURRENT and runs from negative to positive

Current (Abbreviated to I, e.g. I = 1) is measured in amps (A) and is

## Coulombs (C)

Therefore if the current flowing through the wire or toaster or hair dryer is 1 amp, that means that 6.25X10<sup>18</sup> electrons flowed past that point every second



## **Coulomb** Questions

How many electrons pass a point every second if the current is 2 A?

How many electrons pass a point every second if the current is 12.6 A?

What is the current if 3.125x10<sup>18</sup> electrons pass a point every second?