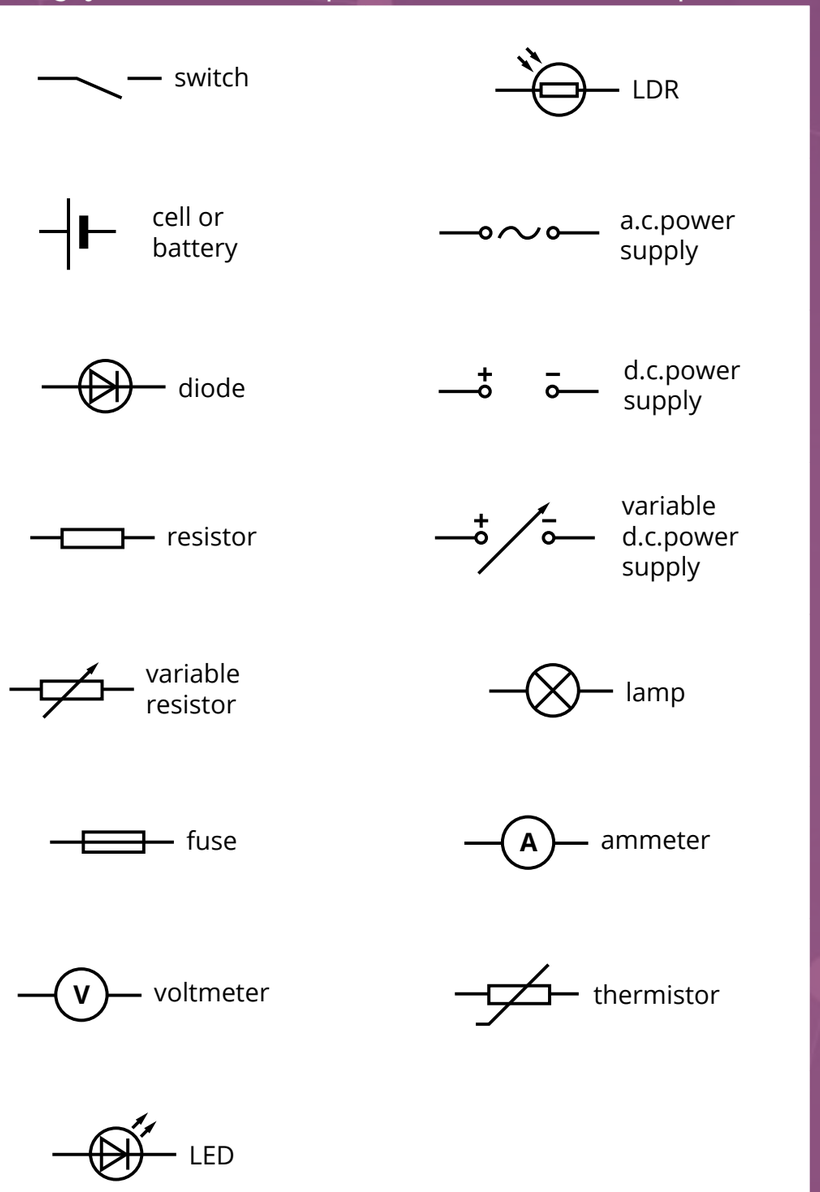
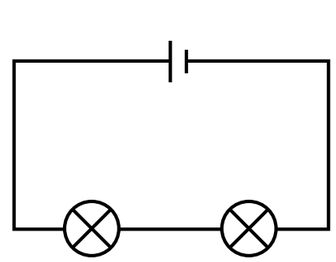
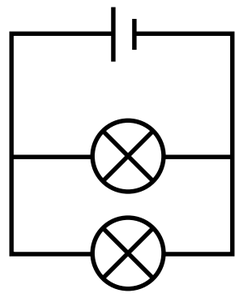
The following symbols are used to represent different electrical components:



Resistors are used to control or change the current. Fixed resistors are used to lower the current but variable resistors, thermistors and LDRs (light dependent resistors) can change their resistance and change the current.
Variable resistors can be changed by moving a slider or turning a dial, e.g. dimmer switch.
Thermistors change depending on the **temperature;** higher temperature = lower resistance.
LDRs change depending on the **light** on the LDR; brighter light = lower resistance.

When you draw a circuit; remember to draw the **correct symbols** in place first then connect using **straight** lines to represent the **wires**.

Series and parallel circuits

Series	Parallel
	
Equal current everywhere in the circuit. **Voltage** is **shared** between the components but must add to the voltage from the power source.	**Current** is **shared** between the components but must add to the current from the power source. **Equal voltage** across each component.

Current is measured using an **ammeter** which must be connected in **series**.

Voltage is measured using a **voltmeter** which must be connected in **parallel**.

Resistance can be calculated using this equation:

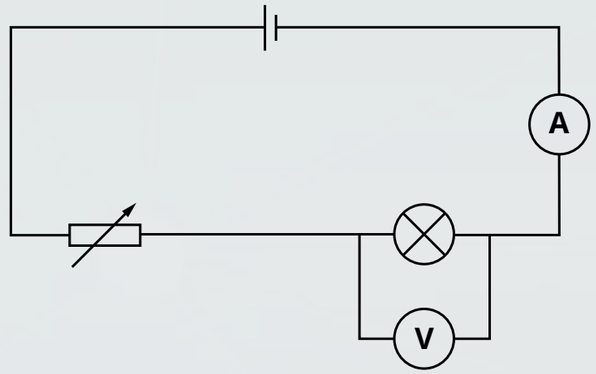
$$Current\ (A) = \frac{Voltage\ (V)}{Resistance\ (\Omega)}$$

Series	Parallel
When you add resistors in series, the resistance increases according to this equation. $R = R_1 + R_2$	When you add resistors in parallel, the resistance of the circuit decreases. $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$

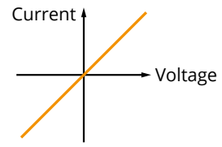
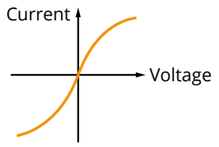
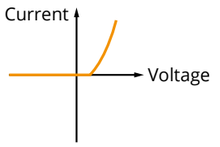
The **power** of a circuit represents the energy transferred per second. It is measured in Watts where **1W = 1 Joule per second.**
These equations can be used to calculate power:

$Power(W) = Voltage(V) \times Current(A)$
$Power(W) = Current(A)^2 \times Resistance(\Omega)$
$Energy(J) = Power(W) \times Time(s)$

This circuit can be used to **investigate how the current changes with voltage** for a bulb. The bulb can be swapped for a resistor or a diode to investigate the relationship with different components.



To get a **series** of values you must record the current and voltage then **adjust the variable resistor** and take the next set of results. You can **repeat** this until you have a complete set.

Resistor or wire (At a constant temperature)	Filament lamp	Diode
		
Constant resistance	Resistance increases at higher voltages	Very high resistance (no current) until a specific voltage

These are the results you would get from each device. You must learn the shape of the curve and be able to describe why it is that shape.