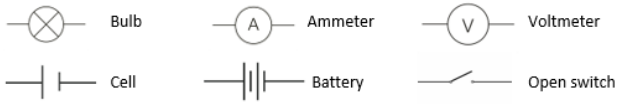
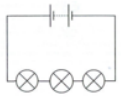
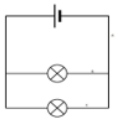
Electrical Circuits

Electrical Circuits	•A circuit is made up of components joined together by wires •Components do different jobs in the circuit, e.g. a bulb transfers electrical energy into light (and heat) energy. •A circuit has to be complete for electricity to flow •Different components are represented by symbols 
Conductors and Insulators	•A conductor is a material that current flows through. •Conductors are usually metals e.g. Copper, iron, gold. •An insulator is a material that current can't flow through. •Insulators are usually non-metals e.g. glass, plastic, wood •Insulators have a very high resistance so it is very hard for much current to flow through them.
Current	•Current is a flow of electrons (charge). •The electrons don't get used up, they are part of the conductor. •The symbol for current is I •The size of the current depends on how many electrons (charges) move past a point per second: Lots of electrons per second = high current. •An ammeter is used to measure the size of the current in Amperes, A. •Ammeters are placed in series with the component you want to measure the current through.
Series Circuits 	•In a series circuit, the components are connected one after the other. There is only one loop. •Current is the same everywhere in a series circuit •Potential difference is shared between the components in a series circuit, but adds up to the total potential difference given by the power supply.
Parallel Circuits 	•In a parallel circuit, there is more than one loop so the current can take different paths in the circuit. •Potential difference is the same everywhere in a parallel circuit and is given by the potential difference of the power supply. •Current is shared between components connected in parallel circuits.

Voltage (Potential Difference)	•Voltage, or potential difference, is the energy transferred in a component by each electron (or unit of charge). •The symbol for potential difference is V. •Potential difference is measured in Volts, V •A voltmeter is used to measure the potential difference and is connected in parallel across a component. •Increasing the potential difference in a circuit will mean that more energy is transferred per unit of charge •Different sized batteries have different potential differences. •Mains voltage is about 230V.
Electrical Safety	•Electricity can be very dangerous and can cause serious injury. •People can receive an electric shock if using damaged electrical appliances or using electricity in an unsafe way. •High voltage electricity can flow through a person's body •This can cause the heart to beat incorrectly or to stop completely (cardiac arrest) and severe burns.
Static Electricity	•Parts of atoms cause electrons can build up or be rubbed away onto surfaces. •This build up of charge (electrons) on the surface of a material is called static electricity. •Friction is the force responsible for causing electrons to transfer from one surface to another. •If an insulated object touches a charged object, it also becomes charged. •Like charges repel, opposite charges attract
Power and Paying For Electricity	•The power rating of an appliance tells us how much energy it transfers per second. •Appliances with higher power ratings transfer more energy per second. •When we pay for electricity, we are paying for the electrical energy transferred by the appliance. •Using more efficient appliances is a way to pay less for electricity, as well as using less electricity overall.
Electricity Calculations	•Charge = Current x Time •Potential Difference = Current x Resistance •Power = Current x Potential Difference •Energy = Power x Time (this can be used when energy is measured in Joules and in kWh.