This is a component, and this is a component, and this is a component, and this is electricity.

Electricity flows through circuits. Circuits are the network of power supplies, wires, and components. Series circuits are basicall circuits where everything is connected in a single loop. This means that if one of the components breaks, then the entire circuit will stop working. To counter this, we use parallel circuits. Parallel circuits are circuits in which the components are connected alongside one another, forming extra loops within the circuit. This means that if one of the components breaks, then the rest of the circuit will still be able to function.

In a series circuit, current, which is the rate of flow of charge, will be the same throughout the circuit, whereas, in a parallel circuit, current will differ at each branchm so to calculate the total current, we add up all of the current measured at each branch.

Potential difference, also known as voltage, is a measure of energy between two points in a circuit.

Resistance is a measure of the difficulty for current to flow. A high resistance means it is harder for current to flow.

Electric components are the parts of the circuit that electricity is supplied to, in order to allow them to carry out a function. We need to know the symbols for the following components, and what they do. This is a cell. It converts stored chemical energy into electrical energy to power a circuit. This is a switch. A switch can be used to turn a circuit off, when it is open, or on when it is closed. This is a lamp. Lamps emit light, due to the electical current heating their filament. This is resistor. A resistor limits the flow of electrical current. This is a variable resistor; it can change how much it limits the flow of electrical current. This is a thermistor; its resistance decreases with temperature increase. This is an LDR. Its resistance decreases as light intensity increases. This is a semiconductor diode, or just known as a diode. It allows current to flow in one direction only. This is a fuse. It will melt if too much current flows through it. This is an LED. An LED emits light, when current flows through it, as it will release energy in the form of photons. This is an ammeter; it can measure current. This is a voltmeter, it can measure potential difference between two points on a circuit.

There are two types of current. Direct Current, and Alternating Current. Direct Current only flows in one direction. Alternating Current constantly changes the direction that it flows in. Alternating current is the current that flows in the UK’s mains supply at a potential

difference of 230v and a frequency of 50Hz. To connect an electrical appliance to our mains supply, we use plugs. Plugs contain three copper wires that are coated with plastic. The brown coloured wire is the live wire which is the wire that actually carries the 230v of potential difference from the power source to the appliance. The blue coloured wire is the neutral wire, it competes the circuit, carrying electricity from the appliance back to the power source. The yellow and gree striped wire is the Earth wire. The earth wire is connected to the case of the plug, if a fault occurs where current is present on the plug's case, the earth wire will carry the current into the earth and prevents the current from entering a human person and harming them if they were to touch it. The earth wire is purely a safety feature. The plug also contains other safety features. The plastic insulation around the metal wires is a safety feature. The fuse is also a safety feature. A fuse is a ceramic cylinder that encapsulates a thin wire, situated between the live wire and the live pin of the plug. A fuse will melt if current is too high. Therefore if a dangerously high current is flowing through the live wire, the fuse will melt, and the current will not be able to reach the appliance.

Electricity is able to reach our homes from a power source through a network of cables called the national grid. Through the national grid, electricity is transferred at a low current, but high voltage of 400,000 volts to reduce the amount of energy lost during transmission. However, this configuration of electricity transmission is not sufficient enough to power our homes, so, we use transformers to alter voltage and current. A transformer is formed from two coils of wire around a magnetic core. A transformer works in the following stages: a primary voltage drives an alternating current through the primary coil. 2. The primary coil current produces a magnetic field, which changes as the current changes. 3. The iron core increases the strength of the magnetic field. 4. The changing magnetic field induces a changing potential difference in the secondary coil. 5. The induced potential difference produces an alternating current in the external circuit. A step-up transformer increases the voltage and reduces the current. Its secondary coil will have more turns than its primary coil. A step-down transformer is the opposite, it decreases the voltage, and increases the current. Its primary coil will have more turns than its secondary coil.

Have you ever rubbed a ballon against your head, and then raised it to witness your hairs all standing up? This is because of static electricity. Static electricity is built up by friction. When insulating materials are rubbed together, the friction causes electrons to gain energy, if they gain enough energy the electrons may be "rubbed off" from one material to the other. This electron transfer causes the materials to become charged. The material

that gains electrons becomes negatively charged, and the material that loses electrons becomes positively charged.

You may have experienced an “electric shock” from static electricity before. This occurs when you touch a positively charged object, electrons will jump from you to the object. As the electrons jump across the gap between you and the object, it causes a spark.

Electric charges create electric fields. Electric fields are regions around a charged object. An object can have a negatively charged electric field, or a positively charged electric field. If you put a charged object within an electric field, it will experience either a force of attraction, or a force of repulsion. Attraction will occur if the fields have opposite charges, and repulsion will occur if the fields have like charges.