

Knowledge I need to know by the end of this topic:

- There are dangers associated with electricity both in the home and outside.
- Atoms are made up of protons, neutrons, and electrons.
- Electrons are negatively charged particles. An electric current is a flow of electrons.
- For electrons to flow, there must be a complete circuit and a battery or cell.
- Each component in a circuit has an associated circuit symbol (battery, cell, lamp, buzzer, motor, switch, resistor, variable resistor, fuse, ammeter, voltmeter).
- Electrical conductors are materials which allow current to flow through them.
- Electrical insulators are materials which do not allow current to flow through them.
- Current is measured in amps (A) using an ammeter. Ammeters must be connected in series.
- Current is the same at all points in a series circuit.
- Voltage is a measure of the energy given to the electrons by the battery or cell.
- Voltage is measured in volts (V) using a voltmeter. Voltmeters must be connected in parallel.
- Supply voltage is the total voltage provided to the circuit by the battery or cell.
- The voltage across the components in a circuit adds up to the supply voltage. ($V_s = V_1 + V_2 + \dots$)
- Resistance is a measure of how difficult it is for charges to move through a material.
- Resistance is measured in Ohms (Ω). Resistance can be calculated using $R = V \div I$.
- The higher the resistance of a material, the more difficult it is for the charges to move through it.
- As the length of a wire increases, the resistance increases. As the diameter of a wire increases, the resistance decreases.
- Wires made of different materials will have different resistances.
- We can make a simple cell using fruit and metals.
- Many types of cell are available, with a wide range of applications.