Science Y4 Autumn What makes electricity work?

This unit is the first introduction to studying electricity in Key Stage 2. Children will learn about what electricity is and how it was discovered. They will identify which appliances use electricity in their homes and how to keep themselves safe. Children will construct circuits, start to create pictorial circuits and conduct an investigation into how easily different types of switches can break and reconnect

In this unit children will:

- Explore where electricity comes from.
- Know why electricity is so important.
- Compare electricity in our area compared to less fortunate countries.
- Experiment what material conducts electricity the best.
- Build circuits and look at how they are formed.
- Develop their knowledge on circuits by using switches and other electrical components.
- Use their knowledge to generate a STEM activity.

Prior Learning

FS – Talk about how things happen and why things work

Cross Curricular Links

Maths - Measurements.

Key Vocabulary

circuit - A complete route which an electrical current can be flown around.

current – a flow of electricity through a wire.

physics – the study of forces including electricity and the way it affects objects.

battery – a small device that provides power for electrical items.

cell – a device used to generate electricity. A battery is an example of a cell.

conductor – any material electricity can pass through.

insulator – any material that electricity cannot pass through or along.

buzzer - an electrical device that makes a buzzing sound.

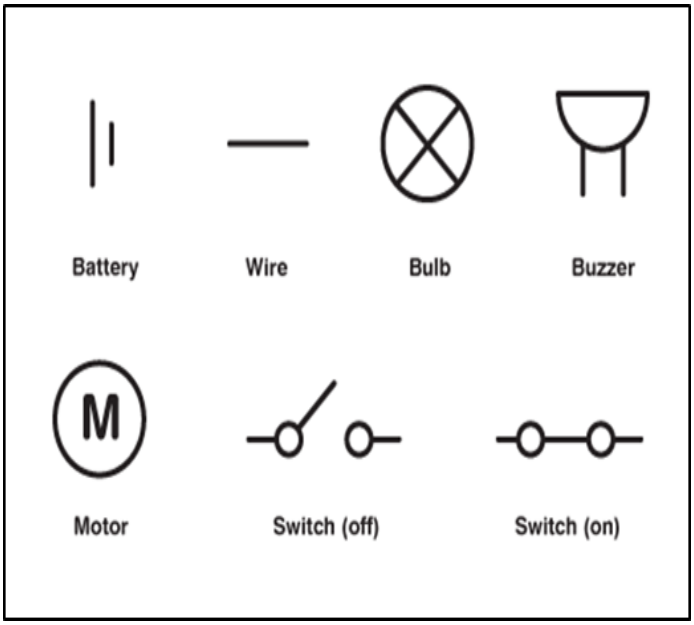
motor – a device that changes electrical energy into movement.

wire – a long thin piece of metal that carries an electrical current often covered in plastic for safety.

voltage – an electrical force that makes electricity move through a wire, measured in volts (V).

Key Knowledge

- Electricity is generated using energy from natural sources such as the Sun, oil, water and wind.
- These can be called fuel sources.
- Some appliances use batteries and some use mains electricity.
- Batteries come in different sizes, depending on how much and for how long the appliance is used.
- Many of the items we use every day run on electricity. Electricity can be supplied from the mains (these are plugged into power supplies) or from **batteries.**
- Electricity is transported to our homes through **wires** and cables.
- Electricity can also be stored in **batteries** (also known as **cells**).
- A complete circuit is a loop that allows electrical current to flow through wires.
- A circuit contains a battery (cell), wires and an appliance that requires electricity to work – such as a bulb, motor or buzzer. The electrical current flows through the wires from the battery to the bulb, motor or buzzer.
- A switch can break or reconnect a circuit.
- A switch controls the flow of the electrical current around the circuit. When the switch is off, the current cannot flow. This is not the same as an incomplete circuit.
- When objects are placed in the circuits, they may or may not allow electricity to pass through.



- A **conductor** is a material that allows electricity to flow easily throughout the material. Metals are often good conductors; silver, gold, copper steel and salt water are just a few examples.
- An **insulator** is a material that does not allow electricity to flow through easily, these can be rubber, glass, oil and diamond.
- Thomas Edison invented the light bulb. He was born in 1847 and was known as one of the greatest inventors in history.

Key Questions

- How will you know if a material conducts electricity?
- Which materials are best for conducting electricity?
- What will happen when more batteries are added to a complete circuit?
- What is renewable energy?