Ocean Academy Poole
an Aspirations Academy
Self-Worth | Engagement | Purpose

Learning Journey Map

Year: **6** Term: **Autumn 1**

Subject: **Science** Topic: **Electricity**

Driving Question: **See North America**
Power Skill: **Collaboration** - Students collaborate with others to complete tasks and students work together as a group to identify group goals.

National Curriculum Learning Objectives

- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- use recognised symbols when representing a simple circuit in a diagram

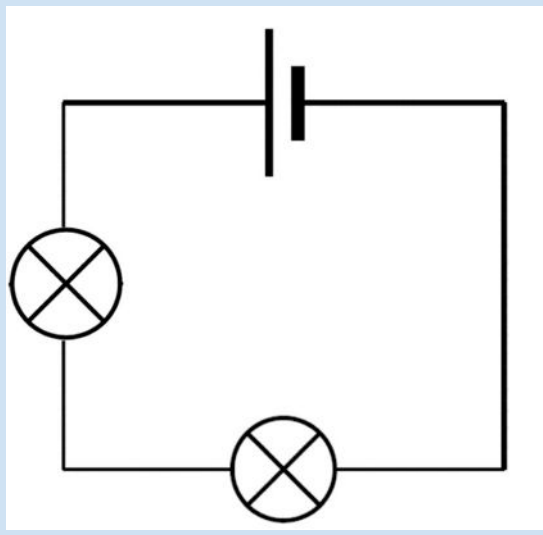
Key Vocabulary

cell	battery	component	series circuit	voltage
current	electron	terminal	motor	buzzer
switch				

Key Learning

Revisit and revise: Year 4 Electricity Learning Journey Map.

Thinking Point
What do you remember about electricity from Year 4?
Tell your partner.



A complete circuit is needed for an electric current to flow. This means there is a complete loop without any gaps, through wires and components, from one terminal of a battery (power source) to its other terminal. If the battery and components are arranged in one single loop, we call this a series circuit.

You can tell if a current is flowing in a circuit if a buzzer (attached the correct way round) makes a sound, a lamp lights, something gets hot or a motor moves. Motors can rotate clockwise or anticlockwise. To change the direction of rotation you can reverse the way the wires are connected. If you are using LED bulbs, they will only work if connected the correct way in a circuit.

Thinking Point
If a circuit is broken, will an electric current still flow?

It is the voltage provided by the battery or power supply that pushes the negatively charged electrons around the circuit. We call the rate of flow of charge (such as electrons) – how many charges pass a point in one second –the electric current. In a series circuit, the electric current is always the same in every part of the circuit. The electric current is not 'used up' by an electric bulb in a circuit. The electric current in the wires on both sides of the bulb are the same.

Common Batteries

Many devices are designed to be used with a battery (or power supply) that has a particular voltage; often this is marked on the device. If a device is connected to a battery of smaller voltage, it will not operate properly or not at all. A device can be damaged if it is connected to a battery whose voltage is higher than it is designed for (because it causes a current that is larger than the device is designed to take).

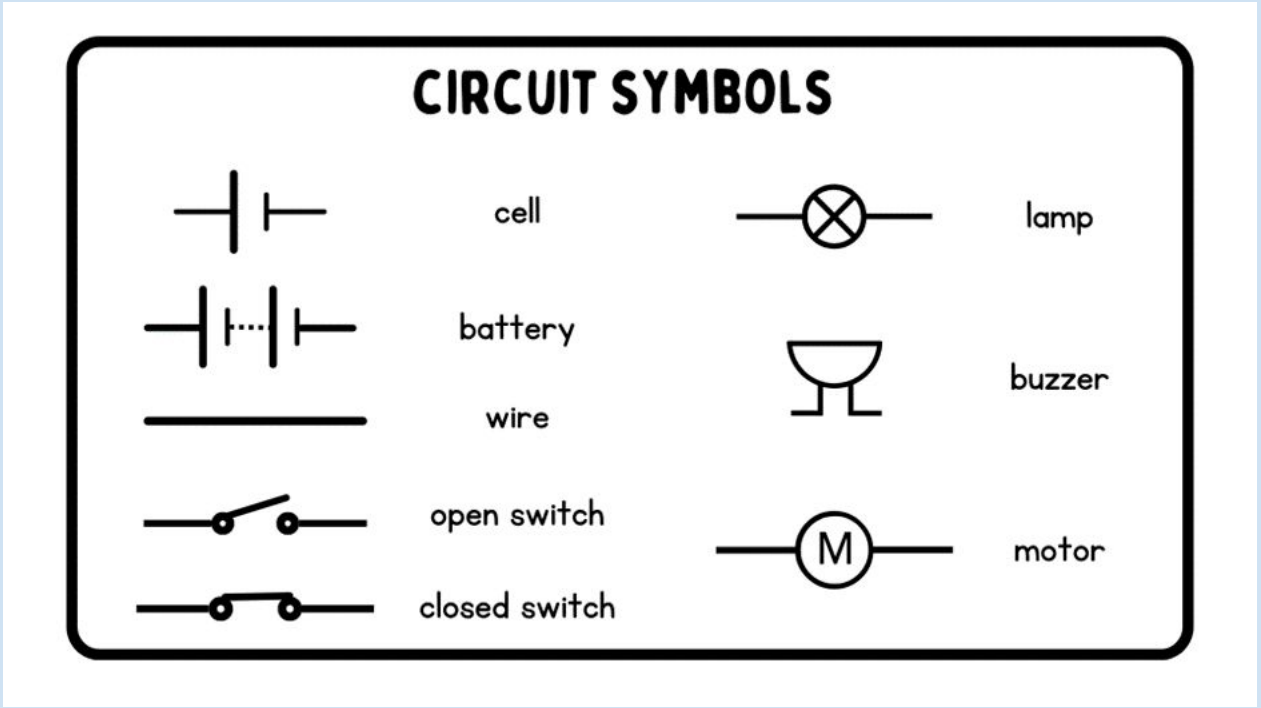
Thinking Point
What would happen if a device is connected to a battery with a smaller voltage than what is required?

Explore and Investigate
Investigating voltage.
Conduct an investigation into voltage, to discover how the change in voltage affects the components within a series circuit.

Resources:
Batteries, cells, wires, light bulbs, buzzers, motors, switches, LEDs

Key Learning

The size of the current in a series circuit depends on the voltage of the battery (or power supply) and the components in the circuit. Increasing the battery voltage increases the current. Increasing the number of components decreases the current.



When more batteries are added to the circuit, there is a larger voltage across the components in a circuit. This causes a greater electric current to flow through it, which in turn affects the component, making lamps brighter, buzzers louder or motors faster. If several batteries are connected in line (in series), the voltage of the combination is the sum of the voltages of the individual batteries, taking account of their directions.

Thinking Point
If you increase the voltage, what will happen to the electric current?