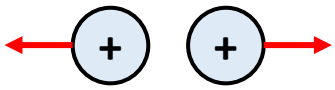
Electricity

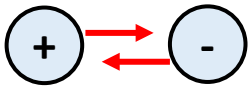
Charges

Some objects or particles can be electrically charged. There are three types of charge:

- Positive charge
- Negative charge
- Neutral (a balance between the two)



Like charges repel away from each other



Opposite charges attract towards each other

Current

Wires used for electrical devices all contain thin metal. Metals conduct electricity because the electrons are free to move.

Electrons are negatively charged and can be made to flow around a wire.

Electrical current is the flow of electrical charge

Moving electrons in wires creates electrical current. **Current is measured in Amps, A.**

Potential Difference

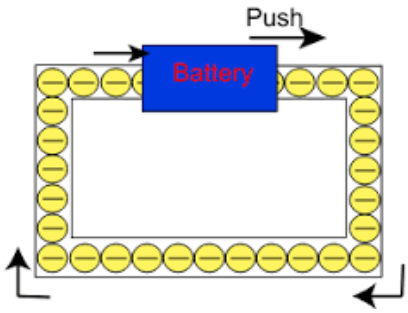
Potential difference is more commonly referred to as voltage.

Batteries (or cells) will provide potential difference to charged particles by pushing them, so they flow around a circuit.

Electrical current will not flow without a potential difference.

By increasing potential difference, you will increase the current.

Potential difference is measured in volts, V.

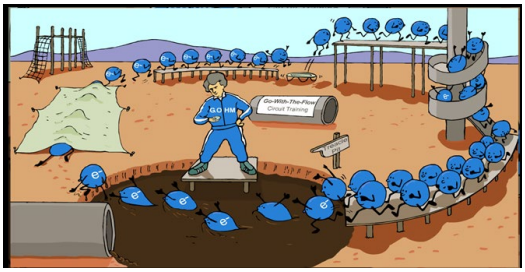


Resistance

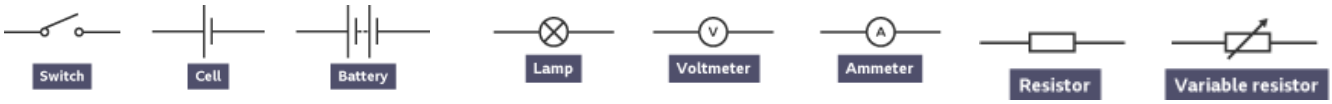
All wires and components have a natural resistance to flowing charge. Each circuit component has a different resistance.

Resistance slows down electric current.
A high resistance = low current
A low resistance = high current

Resistance is measured in ohms, Ω

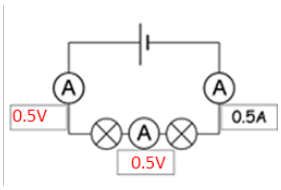


Circuit Symbols

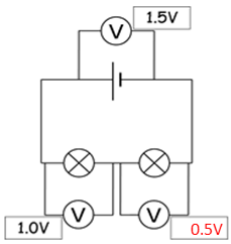


Series Circuits

Series circuits have one loop of wire with components from one end of the battery to the other end.



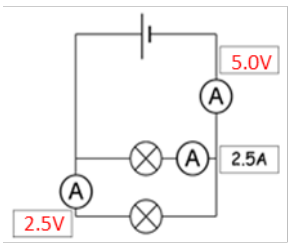
Current always stays the same.



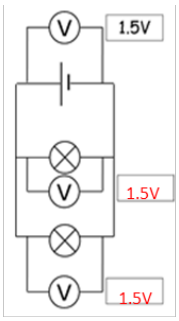
Potential difference is split between components

Parallel Circuits

Parallel circuits have multiple branches of wire for each component.



Current splits for each branch.



Potential difference is always the same

CORE Questions

1	True or Flase. Like charges repel, opposite charges attract.	True.
2	What is meant by electrical current?	The flow of electrical charge
3	A student attaches a wire to a bulb but it won't light up. What else do they need, so the bulb lights up?	A cell / Battery / Power Supply
4	What does a battery provide to a circuit?	Potential difference
5	What are the two types of electrical charge?	Positive and negative
6	True or False. When a circuit is complete, protons flow through the wires.	False. Electrons are free to move through metals. Not protons.
7	Complete the sentence. When the switch is closed the circuit is _____.	Complete.
8	What component is used to measure potential difference in a circuit?	Voltmeter
9	What component is used to measure current in a circuit?	Ammeter
10	True or False. Two batteries make a cell.	False. Two or more cells make a battery
11	A student set up a series circuit with a cell and two bulbs. The ammeter showed that before the first bulb the current was 3A. Suggest the current after the second bulb.	3A
12	A student set up a series circuit with a 4V cell and two bulbs. The voltmeter showed 3V on the first bulb, suggest the potential difference of the second bulb.	1V
13	A student set up a parallel circuit with a cell and two bulbs. The ammeter showed that before the wires splt for each bulb that the current was 6A. Suggest the current flowing through each bulb.	3A
14	A student set up a parallel circuit with a 3V cell and two bulbs. Suggest the potential difference of each bulb.	3V
15	A student wanted to measure the current in a circuit. They set an ammeter up in parallel. Suggest why it did not work after.	Ammeters need to be set up in series
16	A student wanted to measure the potential difference in a circuit. They set a voltmeter up in series. Suggest why it did not work after.	Voltmeters need to be set up in parallel
17	Describe what would happen to the current of a circuit if you increased the resistance.	It would decrease.
18	Describe what would happen to the current if the potential difference is increased. (Assume the resistance does not change)	It increases
19	What is restance measued in?	Ohms, Ω
20	What is potential difference measured in?	Voltage, V
21	What is current measured in?	Amps, A