

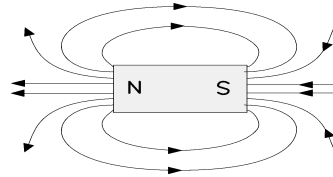
Similar charges **repel**. Opposite charges **attract**

Similar poles of a magnet **repel**  
Opposite poles **attract**

potential difference =  $\frac{\text{energy}}{\text{charge}}$

$$V = \frac{E}{Q}$$

Sketch the magnetic field pattern around a bar magnet

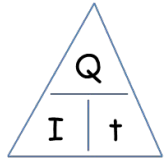


An electric current is a flow of **charge**. In wires it is **electrons** that flow through.

The equation for current flow

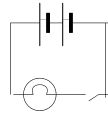
Charge (C) = current (A) × time (s)

$$Q = I \times t$$

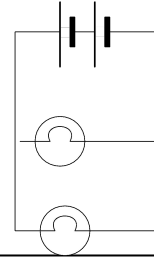


Component	Symbol	Purpose
Cell		Provides electrical energy into the circuit
Battery		Two (or more) cells joined together to provide electrical energy
Bulb/lamp		Converts electrical energy into light and heat
Switch (open)		Prevents there being a complete circuit
Switch (closed)		Completes the circuit
Ammeter		Measures the electric current flowing through it
Voltmeter		Measures the potential difference across a component
Resistor		Opposes the flow of electric current through it

Series Circuit – one pathway around circuit e.g.



Parallel Circuit – more than one pathway around circuit. e.g.



potential difference = current × resistance

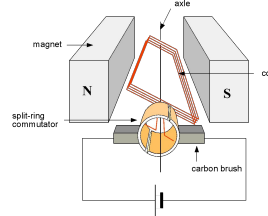
$$V = I \times R$$

- potential difference (V) is measured in volts (V)
- current (I) is measured in amps (A)
- resistance (R) is measured in ohms ( $\Omega$ )

## Electricity and magnetism (EM)

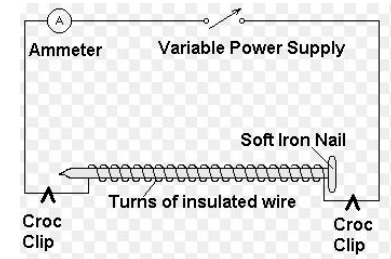
How can a motor be made to spin faster?

1. More coils
2. Stronger magnets
3. More current



How could the motor be made to spin the other way?

How could an Iron nail be turned into an electromagnet? Draw the circuit diagram:



How could you investigate how the strength changes with the number of coils? What would be the independent and dependent variables?

Independent = **number of coils**      Dependent = **number of paperclips lifted**

Similar charges \_\_\_\_\_. Opposite charges \_\_\_\_\_

Similar poles of a magnet \_\_\_\_\_  
Opposite poles \_\_\_\_\_

*potential difference =  $\frac{\text{energy}}{\text{charge}}$*

$$V = \frac{E}{Q}$$

Sketch the magnetic field pattern around a bar magnet

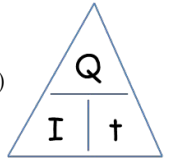


An electric current is a flow of \_\_\_\_\_. In wires it is \_\_\_\_\_ that flow through.

The equation for current flow

$$\text{_____ (C)} = \text{_____ (A)} \times \text{_____ (s)}$$

$$Q = I \times t$$



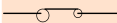
Component	Symbol	Purpose
-----------	--------	---------

Cell		
------	--	--

Two (or more) cells joined together to provide electrical energy



Switch (open)		
---------------	--	--



Measures the electric current flowing through it

Measures the potential difference across a component

Draw a series Circuit – one pathway around circuit e.g.

Draw a parallel Circuit – more than one pathway around circuit. e.g.

$$\text{_____} = \text{_____} \times \text{resistance}$$

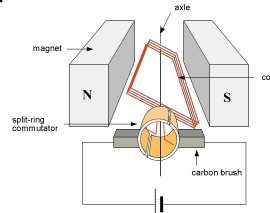
$$V = I \times R$$

- potential difference (V) is measured in volts (V)
- current (I) is measured in amps (A)
- resistance (R) is measured in ohms ( $\Omega$ )

## Electricity and magnetism (EM)

How can a motor be made to spin faster?

- 1.
- 2.
- 3.



How could the motor be made to spin the other way?

How could an Iron nail be turned into an electromagnet? Draw the circuit diagram:

How could you investigate how the strength changes with the number of coils? What would be the independent and dependent variables?

Independent = \_\_\_\_\_ Dependent = \_\_\_\_\_