

## Definitions

What is <b>current</b> ? What are the units? How is it measured?	Current is the rate of flow of charge (measured in amperes, A), it is measured using an ammeter.
What is <b>potential difference</b> ? What are the units? How is it measured?	Potential difference is the energy per unit charge processed (in volts, V), it is measured using a voltmeter connected in parallel across the component.
What is a <b>series circuit</b> ?	There is only one path for the current to flow. The circuit diagram is drawn with only one loop.
What is a <b>parallel circuit</b> ?	More than one path for the current to flow. The circuit diagram is drawn with branch components.
What is the difference between <b>direct current (DC)</b> and <b>alternating current (AC)</b> ?	With direct current, the electrons flow in one direction only. With an alternating current, the electrons are constantly changing direction.

## Equations

Quantity	Word Equation (units)	Symbol Equation
Charge flow	Charge flow (Q) = current (I) x time (t)	$Q = I \times t$
Potential difference	Potential difference (V) = current (I) x resistance (R)	$V = I \times R$
Electrical power	Power (P) = potential difference (V) x current (I)	$P = V \times I$
Electrical power	Power (P) = (current) <sup>2</sup> x resistance	$P = I^2 \times R$
Energy transferred	Energy transferred (E) = power (P) x time (t)	$E = P \times t$
Energy transferred	Energy transferred (E) = charge flow (Q) x potential difference (V)	$E = Q \times V$

## Circuit symbols

	switch (open)		lamp
	switch (closed)		resistor
	cell		voltmeter
	battery		ammeter
	diode		thermistor
	variable resistor		LDR

## IV (current - potential difference) graphs that are typical for different components



### Ohmic resistor

Current directly proportional to p.d.  
Resistance is constant



### Bulb

When the p.d. increases, the filament gets hotter and increases its resistance. Increased potential difference makes no difference to the resistance (increased)



### Diode

Current only starts from certain p.d. almost no current in reverse direction (ohmic after resistance)

## Comparing current and potential difference in series and parallel

	Series	Parallel
Current	same	different
Potential difference	different	same

## Resistors and resistance

How does resistance affect current?	The greater the resistance, the lower the current.
How can the resistance of a component in a circuit be determined?	Use a circuit to measure the current through, and potential difference across the component. Calculate the resistance by using the equation.
How does the resistance of a light-dependent resistor (LDR) change with the intensity of light shone on it?	The resistance of an LDR decreases as light intensity increases.
How does the resistance of a thermistor change with temperature?	The resistance of a thermistor decreases with temperature.

## 1-Fix Plug

Wire	Colour	Function
Earth	Green and yellow stripes	Provides a safe route for electrons. It has an extra insulator coating.
Live	Brown	Carries 230V from the supply to the appliance.
Neutral	Blue	Carries 0V - completes the circuit after the current has been 'used'.



## Transformers

	Primary	Current
Step up	Increases	Decreases
Step down	Decreases	Increases

## Static Electricity

When two different insulators are rubbed together, electrons may transfer from one material to another, causing them to become charged.



A rod and cloth can demonstrate static electricity.

## Electrostatic forces

When forces do charged objects exert on each other?

Opposite charges attract each other, the charges repel each other.

What is an electric field?

The space around a charged object in which a force can be felt.

How does the strength of the electric field vary?

Decreases with distance from the object, stronger with greater charge.



The electric field around a positive charge



The electric field around a negative charge

# Electricity

# Aqa Gcse Electronics

**Y Pai**



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