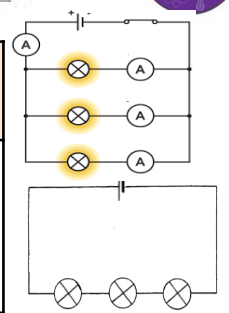




Electrons carry current.
Electrons are free to move in metal.



Cell	Battery	Switch	Lamp	Ammeter	Volt meter	Diode	LED	LDR	Fuse	Resistor	Variable resistor	Thermistor
Store of chemical energy	Two or more cells in series	Breaks circuit, turning current off	Lights when current flows	Measures current	Measures potential difference	Current flows one way	Emits light when current flows	Resistance low in bright light	Melts when current is too high	Affects the size of current flowing	Allows current to be varied	Resistance low at high temp



Current	Flow of electrical charge	Ampere (A)
Potential difference (p.d.)	How much electrical work is done by a cell	Volts (V)
Charge	Amount of electricity travelling in a circuit	Coulombs (C)

Charge = Current X time

$Q = I \times t$

Controlling current

Changing current

Change the p.d. of the cells

Add more components

Ammeter	Set up in series with components
Voltmeter	Set up parallel to components

Resistance (Ω)	A measurement of how much current flow is reduced
The higher the resistance, the more difficult it is for current to flow.	
Increasing resistance, reduces current.	
Increasing voltage, increases current.	

Ohmic conduct or	At a constant temperature, current is directly proportional to the p.d. across the resistor.
Filament lamp	As current increases, the resistance increases. The temperature increases as current flows.
Diode	Current flows when p.d. flows forward. Very high resistance in reverse.



Circuit symbols

Current and Charge

Current, potential difference and resistance

$R = V \div I$

Resistance = Potential difference $\div$ Current

Series and parallel circuits

Series circuit	Current is the same in all components.	Total p.d. from battery is shared between all the components.	Total resistance is the sum of each component's resistance.
Parallel circuit	Total current is the sum of each component's current.	p.d. across all components is the same.	Total resistance is less than the resistance value of the smallest individual resistor.

Series	Parallel
A circuit with one loop	A circuit with two or more loops
Total p.d.	If cells are joined in series, add up individual cell values

AQA Electricity

Domestic uses and safety

Energy transfers

Work is done when charge flowing.

Power (W) = potential difference X current

$R = V \times I$

Power = (current)² X resistance

$P = I^2 \times R$

Energy transferred = Power X time

$E = P \times t$

Step-up transformers

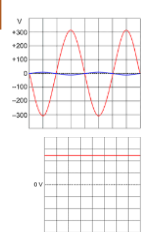
Step-down transformers

Increase voltage, decrease current

Decrease voltage, increase current

Increases efficiency, reduces heat loss.

Makes safer for houses.



National Grid

Distributes electricity generated in power stations around UK

Thermistor	LDR	Alternating current	Direct current
Resistance varies with temperature	Resistance varies with light intensity	p.d. switches direction many times a second, current switches direction	p.d. remains in one direction, current flows the same direction
Resistance decreases as temperature increases.	Resistance decreases as light increases.	Generator.	Cell or battery.

Static electricity

PHYSICS only

Static electricity

Electrical charge is stationary

When two insulating material are rubbed together, electrons move from one material to the other.

Shocks

Walking on carpet causes friction. Electrons move to the person and charge builds up. When the person touches a metal object, the electrons conduct away, making a spark.

Electric fields

Charged objects create electric fields around them. Strongest closest to the object. The field direction is the direction of force on a positive charge. Add more charge increases field strength.

3 pin plug	Live - Brown	Carries p.d from mains supply.	p.d between live and earth = 230V
	Neutral - Blue	Completes the circuit.	p.d. = 0V
	Earth – Green and Yellow stripes	Only carries current if there is a fault.	p.d. = 0V

