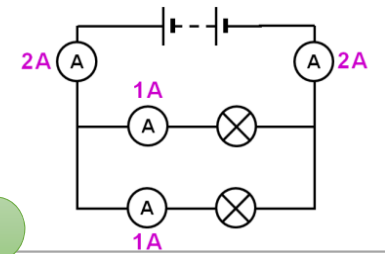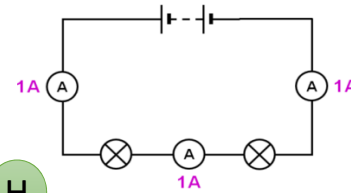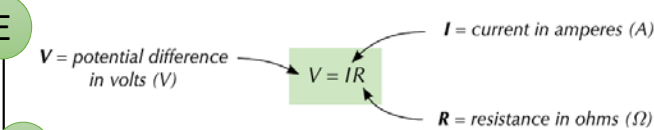# Physics Crib Sheet: Topic 2

A

Current (Amps)	The flow of electric charge. The size of the current is the rate of flow of charge.
Potential Difference (Volts)	The driving force that pushes electric charge around a circuit.
Resistance (Ohms)	Anything in a circuit that reduces the flow of current.

B

Charge flow (C) = Current (A) x Time (s)

How to connect a voltmeter and ammeter

C

ammeter connected in line with the lamp

voltmeter connected across the lamp

E

V = potential difference in volts (V) → $V = IR$ ← I = current in amperes (A)

R = resistance in ohms (Ω)

F

| Ohmic Conductor | Filament Lamp | Diode |
| lowest resistance / highest resistance | | current / potential difference |

G

Light dependent resistors (LDR)
- In bright light the resistance falls
- In darkness the resistance is highest
- Used in automatic night lights and street lamps

Thermistors
- When hot, the resistance drops
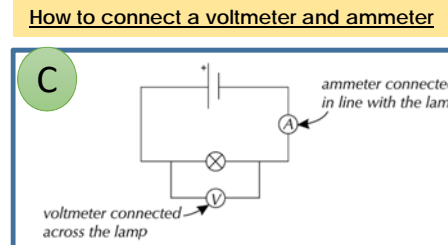- When cooler, the resistance increases
- Used in thermostats

H

Series circuits
- Current is the same at all points
- Potential difference is shared between the components.
- Add up the pd of the components to find the pd of the power supply
- Add up the total resistance of each component to find the total resistance of the circuit

I

Parallel circuits
- Total current in the circuit is the sum of current in each branch
- Each branch has the same total pd as the power supply
- Adding an extra branch containing a resistor reduces the total resistance of the circuit
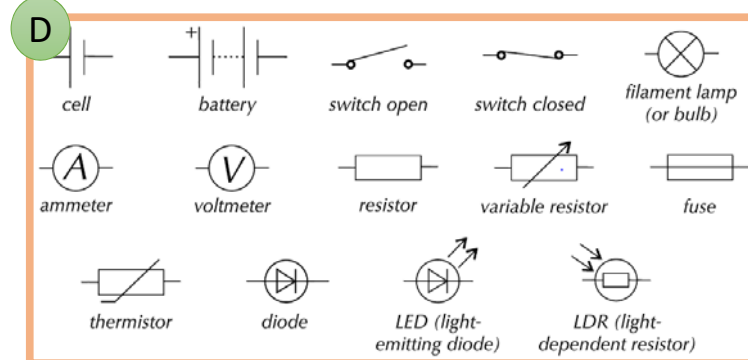
J

Investigating the effect of wire length on current and potential difference

1) Attach a crocodile clip to the wire level with 0 cm on the ruler.
2) Attach the second crocodile clip to the wire a short distance from the first clip.
3) Write down the length of the wire between the clips.
4) Close the switch, then record the current through the wire and the pd across it.
5) Use $R = V \div I$ (from the equation $V = IR$ on p.181) to calculate the resistance of clips
6) Open the switch and move the second crocodile clip along the wire.
7) Repeat steps 3 to 6 for a range of wire lengths.

D

cell | battery | switch open | switch closed | filament lamp (or bulb)

ammeter | voltmeter | resistor | variable resistor | fuse

thermistor | diode | LED (light-emitting diode) | LDR (light-dependent resistor)

K

Energy transferred (J) = Power (W) x Time (s)

L

E = energy transferred (J) → $E = QV$ ← V = potential difference (V)

Q = charge (C)

national grid

power station

pylons and electricity cables

step-up transformer | step-down transformer | consumers

M

- Step up transformers increase pd and decrease the current
- This reduces energy loss in the wires
- Step down transformers decrease pd so that the supply is safe for use in homes

Earth wire | Neutral wire | Cable grip

Fuse | Live wire | Outer insulation