

OCR B Physics A Level

3.1.3 - Sensing

Flashcards

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What is current?



What is current?

Current is the rate of flow of charge in a circuit.



How do you measure the current at a point in a circuit?



How do you measure the current at a point in a circuit?

To measure current at a point, attach an ammeter in series with this point.



Describe the current variations in series and parallel circuits.



Describe the current variations in series and parallel circuits.

- In series circuits, the current is the same at all points in the circuit.
- In parallel circuits, the current is split between the branches of the circuit.



What is Kirchhoff's first law?



What is Kirchhoff's first law?

- Kirchhoff's first law is an application of the conservation of charge.
- The total current entering a junction must be equal to the total current leaving it.



What equation is used to calculate the work done when a charge moves across a potential difference?



What equation is used to calculate the work done when a charge moves across a potential difference?

$$\textit{Work Done} = \textit{Charge} \times \textit{Voltage}$$



What is power?



What is power?

The rate of transfer of energy.



What **two** equations can be used to calculate power?



What **two** equations can be used to calculate power?

$$P = \text{Energy Transferred} / \text{Time}$$

$$P = \text{Current} \times \text{Voltage}$$



What is the unit of power?



What is the unit of power?

Watt, W



What is Joule heating?



What is Joule heating?

When a resistance opposes the flow of charge, causing energy to be wasted as heat.



What is the opposite of resistance?



What is the opposite of resistance?

Conductance



What is conductance?



What is conductance?

Conductance is a measure of how easily electrons can flow through a given material.



State **two** equations for conductance (G).



State **two** equations for conductance (G).

$$G = 1 / \textit{Resistance}$$

$$G = \textit{Current} / \textit{Voltage}$$



What is the equation for total resistance of resistors in series?



What is the equation for total resistance of resistors in series?

$$R = R_1 + R_2 + \dots$$



What is the equation for total resistance of resistors in parallel?



What is the equation for total resistance of resistors in parallel?

$$1/R = 1/R_1 + 1/R_2 + \dots$$



What is the equation for the total conductance of components in series?



What is the equation for the total conductance of components in series?

$$1/G = 1/G_1 + 1/G_2 + \dots$$



What is the equation for the total conductance of components in parallel?



What is the equation for the total conductance of components in parallel?

$$G = G_1 + G_2 + \dots$$



Why does resistance increase with temperature?



Why does resistance increase with temperature?

- As temperature increases, the ions in a metal gain more kinetic energy.
 - This means they vibrate more.
 - Consequently, electrons collide more frequently with the ions, making it harder for the current to pass through.



What makes conductors good at conducting electricity?



What makes conductors good at conducting electricity?

They have a large number of mobile charge carriers (free electrons) that can carry a current.



How does a semiconductor work?



How does a semiconductor work?

The number of mobile charge carriers increases with a factor such as light or heat, meaning their ability to conduct electricity also increases.



Give **two** examples of semiconductors.



Give **two** examples of semiconductors.

1. Light Dependant Resistors (LDRs)
2. Thermistors



What is the electromotive force of a power supply?



What is the electromotive force of a power supply?

EMF is the energy provided by the source per unit charge.



What is Kirchhoff's second law?



What is Kirchhoff's second law?

The sum of all the voltages across a circuit must equal the EMF of the circuit.



What is internal resistance?



What is internal resistance?

The resistance inside a power supply, due to the materials that it consists of.

