# OCR (B) Physics GCSE

## Topic 3.2 - What determines the current in an electric circuit?

Flashcards

# Define an electric current

# Define an electric current

Current is the rate of flow of charge in an electric circuit.

# What is required in order for a charge/current to flow?

# What is required in order for charge to flow?

- A potential difference
- A closed circuit

# Describe the value of current across a circuit

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Current has the same value at any point in a closed (series) circuit.

# Give an equation linking charge and current, giving SI units

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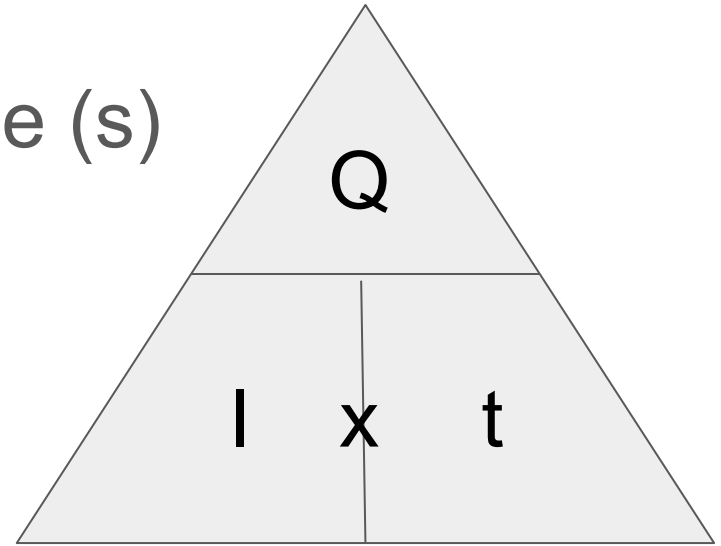
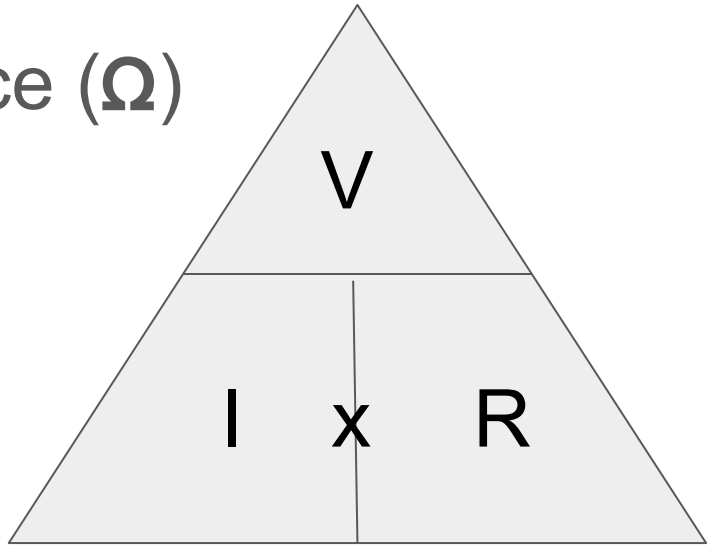
charge (C) = current (A) x time (s)



# Give an equation linking current and voltage, giving all SI units

# Give an equation linking current and potential difference, giving all SI units

p.d. (V) = current (A) x resistance (Ω)



# Define conductors in an electrical circuit

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The components of the circuit (including wires) which carry a charge and conduct electricity.

# Define resistors in an electrical circuit

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Components such as resistors, lamps and motors which resist the flow of charge through them.

# Why are wires not considered resistors?

# Why are wires not considered resistors?

Their resistance is so small it is considered negligible.

# How does resistance affect the current flowing through a circuit?

How does resistance affect the current flowing through a circuit?

The larger the total resistance in the circuit, the smaller the current will be.

# Describe an experiment to investigate the resistance of a wire

# Describe an experiment to investigate the resistance of a wire

- Use a length of wire connected to an ammeter (in series), a voltmeter (in parallel) and a power supply.
- Connect two crocodile clips to the wire, one at each end, and record the current and voltage.
- Vary the length of the wire (moving one of the clips), recording V and I.
- Plot a graph of V against I; the gradient = resistance of wire.

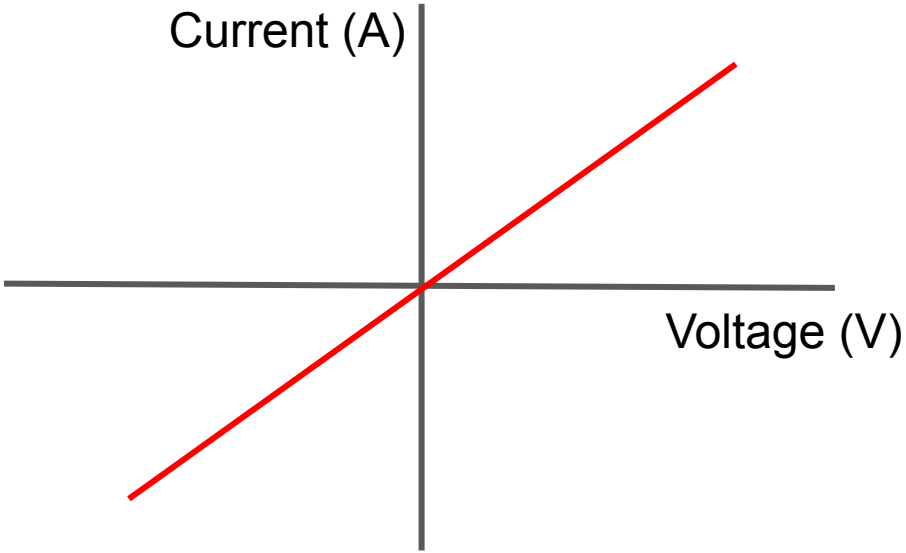
# Describe the key features of an **ohmic** conductor

Describe the key features of an **ohmic** conductor

Resistance is constant, meaning the conductor's IV characteristic (graph of current against voltage) has a linear (straight line) gradient.

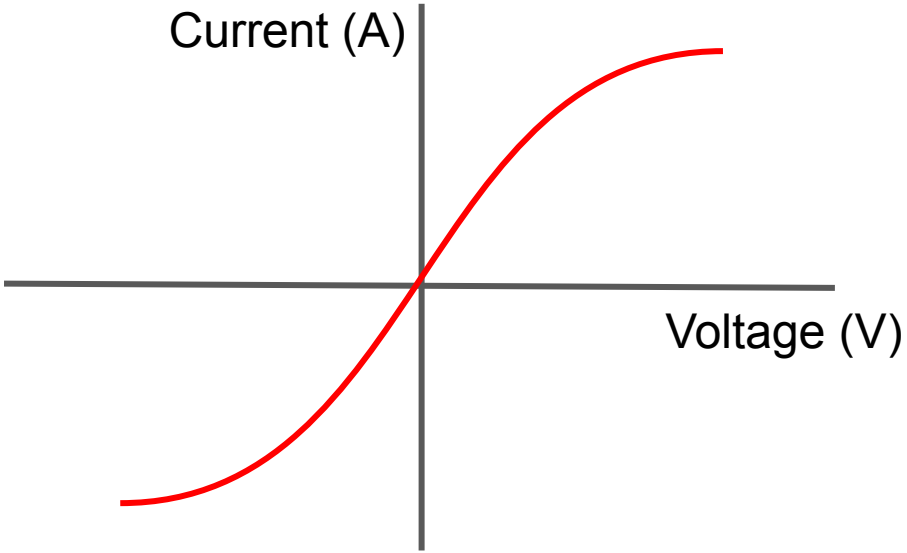
# Draw the IV characteristic of an ohmic conductor (at a constant temperature)

# Draw the IV characteristic of an ohmic conductor



# Draw and explain the IV characteristic of a filament lamp

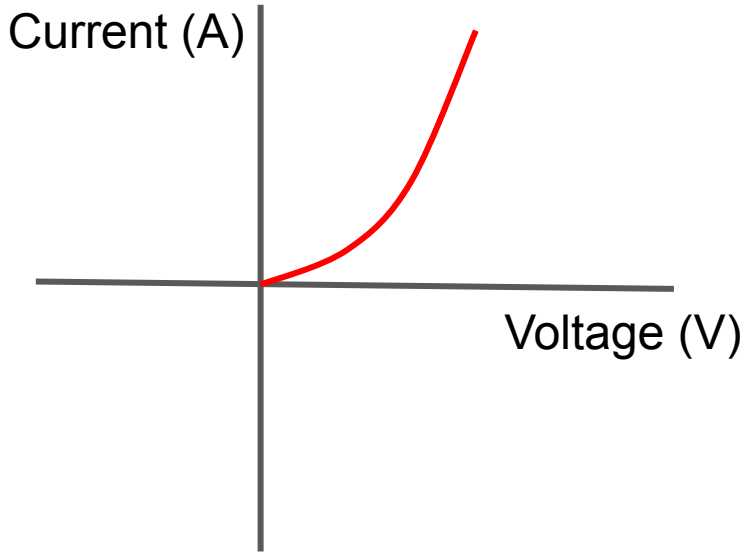
# Draw and explain the IV characteristic of a filament lamp




When current flows, the filament produces heat. This increases the resistance of the filament (R=V/I)

# Draw and explain the IV characteristic of a diode

# Draw and explain the IV characteristic of a diode




Current through a diode flows in one direction only, as it has a very high resistance in the opposite direction.

# How does resistance change with temperature?

# How does resistance change with temperature?

As temperature increases, ions and electrons have more kinetic energy. This results in more collisions between the stationary metal ions, making it more difficult for electrons to move through the wire and carry a charge. Therefore resistance increases with temperature.

# What is a thermistor?

# What is a thermistor?

A resistor in which resistance **decreases** as temperature **increases**.

# What is an LDR?

# What is an LDR?

A resistor in which resistance decreases as light intensity increases...

e.g. used in automatic night lights.

# Draw the circuit symbol for a switch

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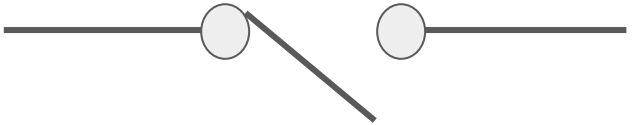
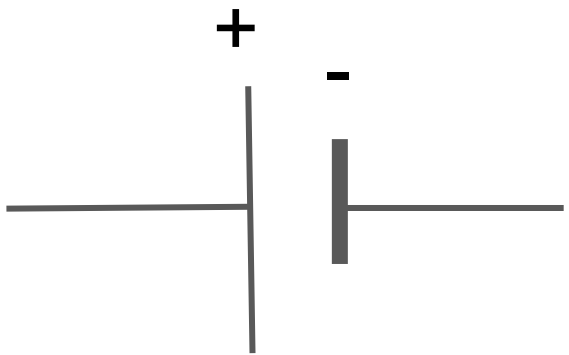
Closed



Open

# Draw the circuit symbol for a cell

# Draw the circuit symbol for a cell



# Draw the circuit symbol for a battery

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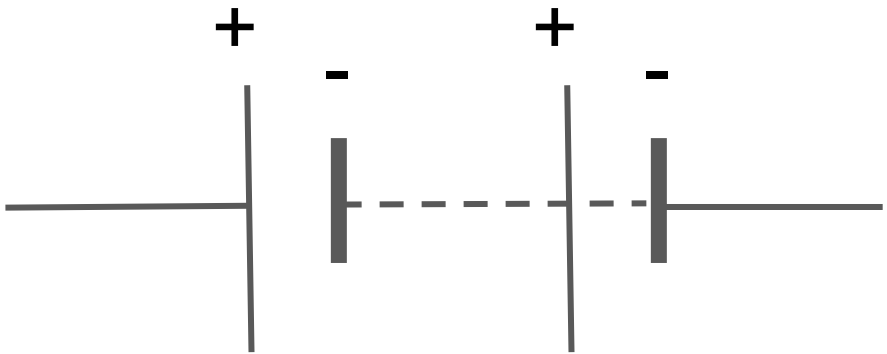

# Draw the circuit symbol for a lamp

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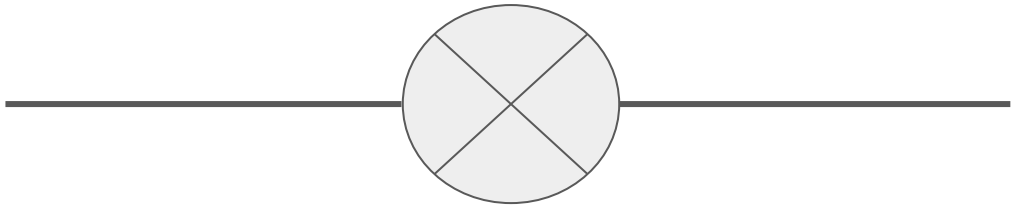

# Draw the circuit symbol for a fuse

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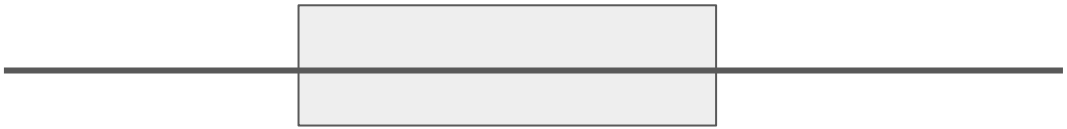

# Draw the circuit symbol for a voltmeter

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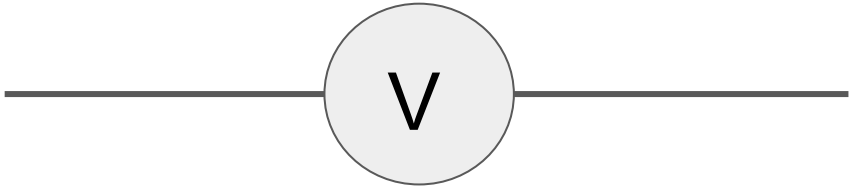

# Draw the circuit symbol for an ammeter

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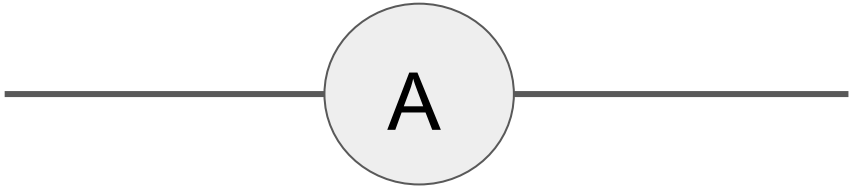
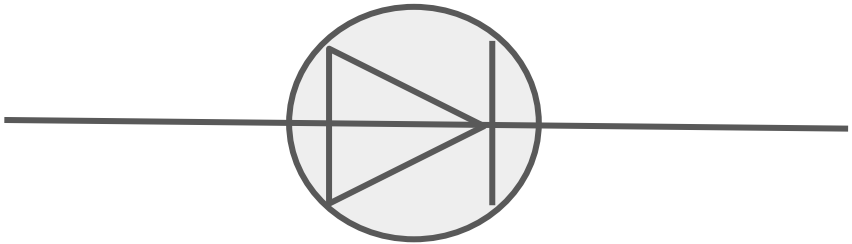


# Draw the circuit symbol for a diode

# Draw the circuit symbol for a diode



# Draw the circuit symbol for a resistor

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# Draw the circuit symbol for a thermistor

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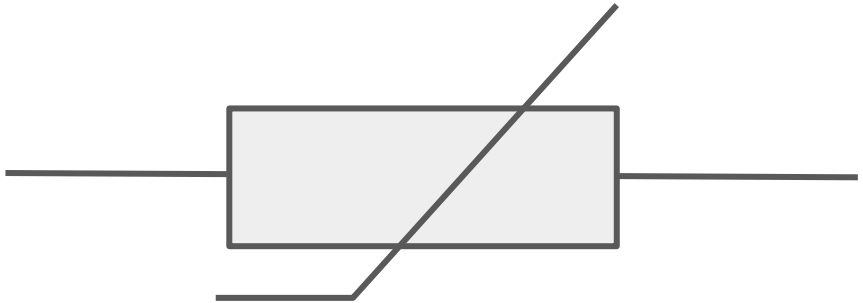

# Draw the circuit symbol for a variable resistor

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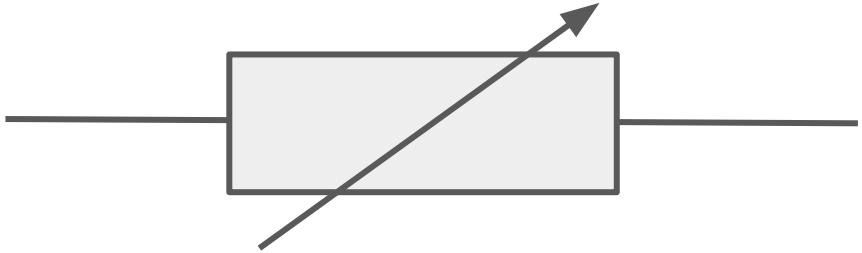

# Draw the circuit symbol for an LDR

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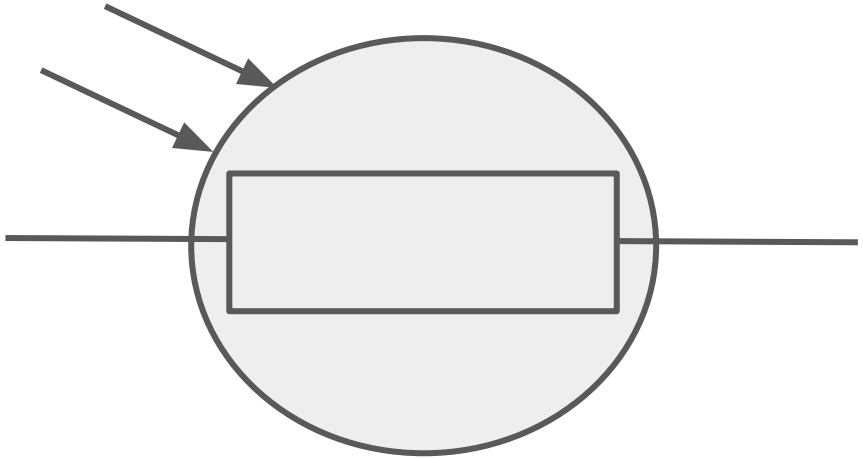

# Draw the circuit symbol for an LED

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