

OCR A Physics GCSE

3.2 - Simple Circuits

Flashcards

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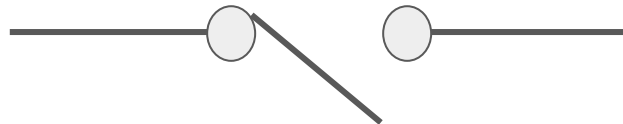
Draw the circuit symbol for a switch.



Draw the circuit symbol for a switch.



Closed



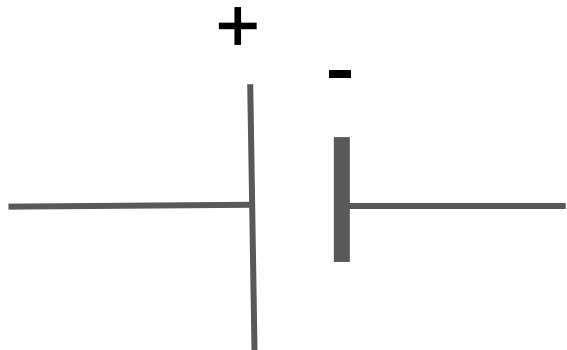
Open



Draw the circuit symbol for a cell.



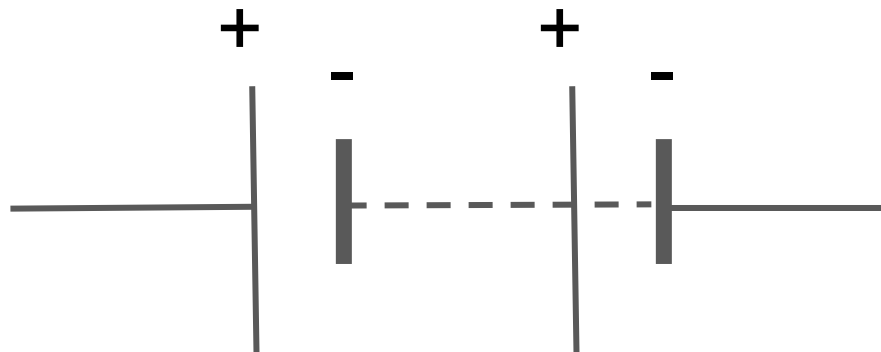
Draw the circuit symbol for a cell.



Draw the circuit symbol for a battery.



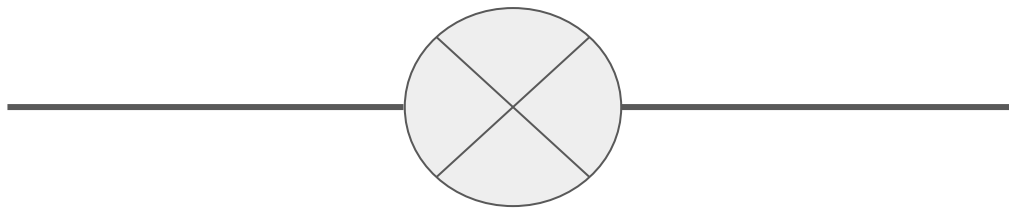
Draw the circuit symbol for a battery.



Draw the circuit symbol for a lamp.



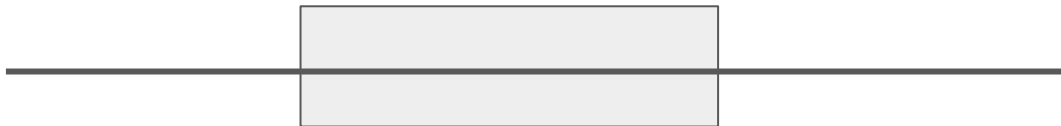
Draw the circuit symbol for a lamp.



Draw the circuit symbol for a fuse.



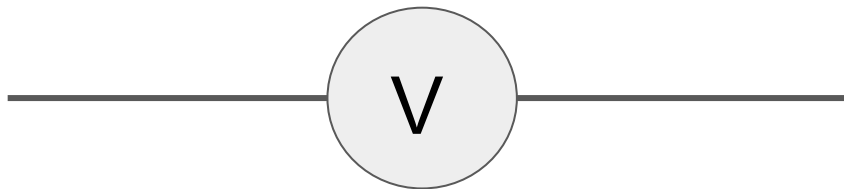
Draw the circuit symbol for a fuse.



Draw the circuit symbol for a voltmeter.



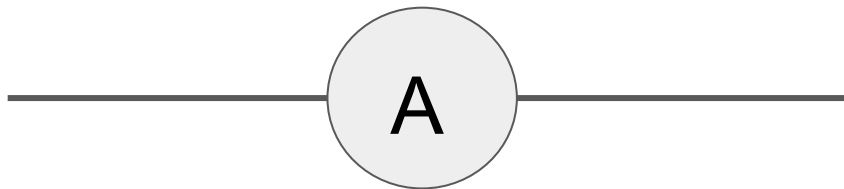
Draw the circuit symbol for a voltmeter.



Draw the circuit symbol for an ammeter.



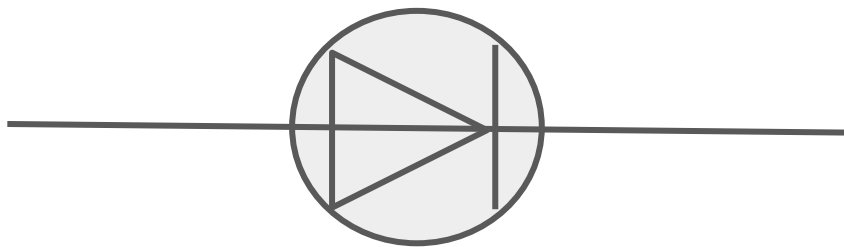
Draw the circuit symbol for an ammeter.



Draw the circuit symbol for a diode.



Draw the circuit symbol for a diode.



Draw the circuit symbol for a resistor.



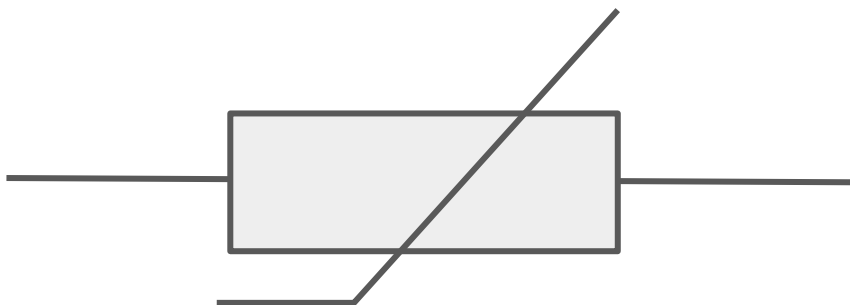
Draw the circuit symbol for a resistor.



Draw the circuit symbol for a thermistor



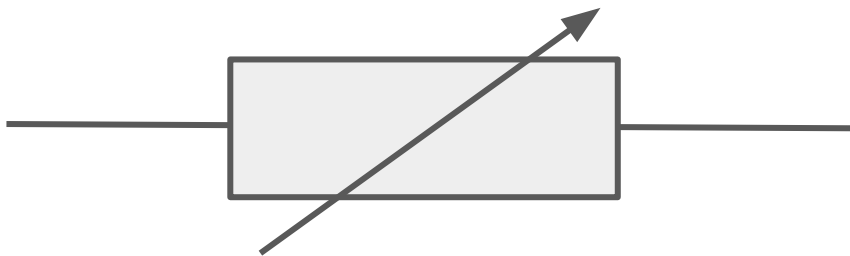
Draw the circuit symbol for a thermistor.



Draw the circuit symbol for a variable resistor.



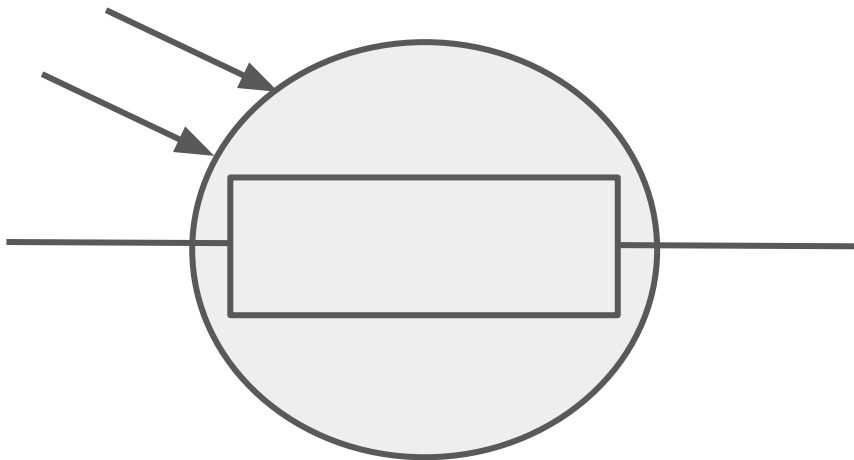
Draw the circuit symbol for a variable resistor.



Draw the circuit symbol for an LDR.



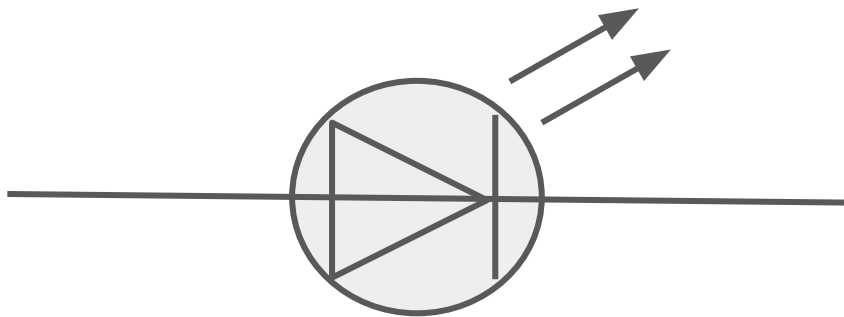
Draw the circuit symbol for an LDR.



Draw the circuit symbol for an LED.



Draw the circuit symbol for an LED.



What is a series circuit?



What is a series circuit?

A series circuit is one in which the same charge passes through all components, so the current through each component is the same.



What is a parallel circuit?



What is a parallel circuit?

A circuit in which the charge is split between branches.



What two factors does the current in a circuit depend on?



What two factors does the current in a circuit depend on?

1. Potential Difference (V)
2. Resistance (R)



What equation should be used to calculate potential difference if current and resistance are known? State the units for all 3 quantities.



What equation should be used to calculate potential difference if current and resistance are known? State the units for all 3 quantities.

$$V = I R$$

Potential Difference (V), Current (A),
Resistance (Ω)



What is an 'Ohmic Conductor'? State the condition required.



What is an 'Ohmic Conductor'? State the condition required.

- A conductor for which current and potential difference are directly proportional.
- Resistance remains constant as current changes.
- Temperature must be constant.



List **four** components for which resistance is not constant as current changes.



List **four** components for which resistance is not constant as current changes.

1. Lamps
2. Diodes
3. Thermistors
4. Light Dependant Resistors (LDRs)



What happens to the resistance of a filament lamp as the temperature increases? Why?



What happens to the resistance of a filament lamp as the temperature increases? Why?

- Resistance increases.
- Ions in metal have more energy, so vibrate more, causing more collisions with electrons as they flow through the metal, creating greater resistance.



What is different about current flow through a diode?



What is different about current flow through a diode?

- The current only flows in one direction.
- Resistance is very high in the other direction, preventing current flow.



State what happens to the resistance of a thermistor as temperature increases.



State what happens to the resistance of a thermistor as temperature increases.

The thermistor's resistance decreases.



Give **two** examples of when a thermistor may be used.



Give **two** examples of when a thermistor may be used.

1. In a thermostat to turn a heater on below a certain temperature.
2. In a freezer to turn on a cooler when the temperature becomes too high.



State what happens to the resistance of a LDR as light intensity decreases.



State what happens to the resistance of a LDR as light intensity decreases.

The LDR's resistance increases.



Give an application for a LDR.



Give an application for a LDR.

- Street lamps or night lights.
- When light levels become low enough, the light gains sufficient current to turn on.



What are the two ways that a component can be connected in a circuit?



What are the two ways that a component can be connected in a circuit?

1. Series (same loop)
2. Parallel (adjacent loop)



How does the potential difference across two components vary when connected in series and parallel?



How does the potential difference across two components vary when connected in series and parallel?

- Series: Total P.D is shared between each component.
- Parallel: P.D across each component is the same.



If two resistors are connected in parallel,
what can be said about their combined
total resistance?



If two resistors are connected in parallel, what can be said about their combined total resistance?

Their total resistance is **less** than the smallest of the two individual resistances.



If two resistors are connected in series,
what can be said about their total
resistance?



If two resistors are connected in series, what can be said about their total resistance?

Their total combined resistance is equal to the **sum** of the two individual resistances.



State two equations for the power of a circuit. Give appropriate units.



State two equations for the power of a circuit. Give appropriate units.

$$P = I V$$

$$P = I^2 R$$

Power (Watts), Current (Amperes)
Potential Difference (Volts), Resistance
(Ohms)



State an equation linking energy transferred, power and time. Give appropriate units.



State an equation linking energy transferred, power and time. Give appropriate units.

$$E = P t$$

Energy (Joules), Power (Watts), Time
(Seconds)



State an equation linking energy transferred, charge flow and potential difference. Give appropriate units.



State an equation linking energy transferred, power and time. Give appropriate units.

$$E = Q V$$

Energy (Joules), Charge (Coulombs),
Potential Difference (Volts)



How should a voltmeter be connected in a circuit?



How should a voltmeter be connected in a circuit?

In parallel to the component that you are measuring the potential difference for.



How should an ammeter be connected in a circuit?



How should an ammeter be connected in a circuit?

In series with the branch you are measuring the current for.

