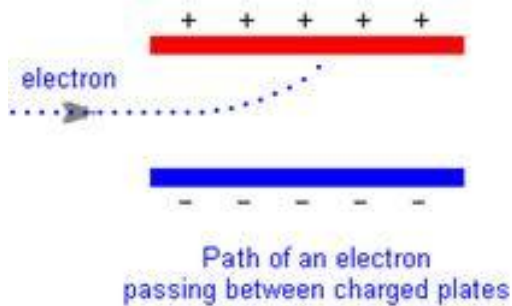
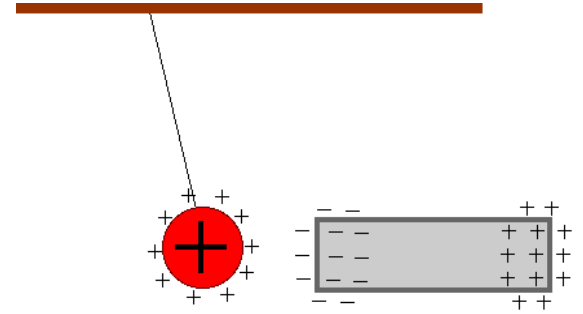


Electricity review questions

1) Charge and induction

The diagram on the right shows a ball suspended on a string. The ball has been given a positive charge.

- State what must have been removed from the ball to give it a positive charge.
- An uncharged bar of metal is brought near the ball.
 - Explain why charge is induced in the bar as shown in the diagram
 - Explain why this results in the ball moving towards the bar



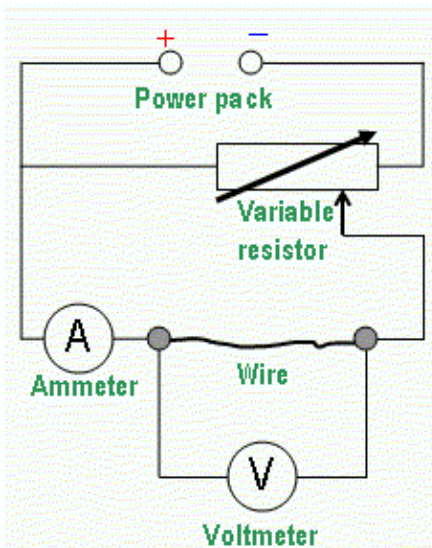
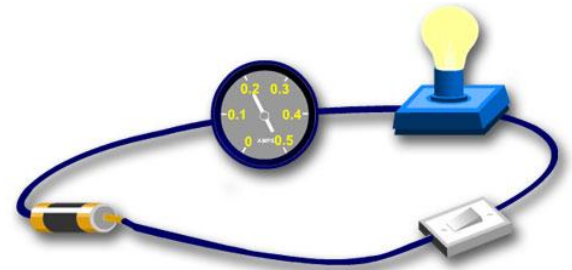
2) The electron and the plates

The diagram on the left shows an electron moving between two charged plates.

- Explain why the electron follows the dotted path
- Re draw the plates showing the electric field lines between the plates and at the edge of the plates.

3) Flow of charge

- The circuit shown has a reading of 0.2 on the meter. State what sort of meter it is, what it is measuring and what units are used for the measurement.
- If the circuit is switched on for 2 minutes how much charge has flowed?



4) Test circuit

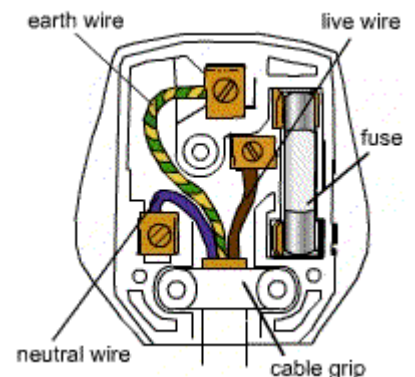
The circuit on the left can be used for testing the current flowing through a wire at different voltages.

- If the emf of the power pack is 12V what is the range of voltage that this circuit could test the wire for?
- Sketch a graph of current vs voltage to show the likely result of the test.
- Sketch and label two other lines on your graph to show the possible results if
 - A longer wire was used
 - A fatter wire was used.

5) Mains electricity

The diagram opposite shows an electric plug.

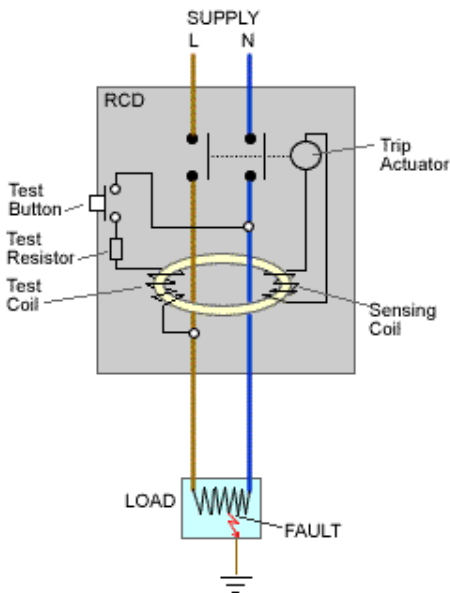
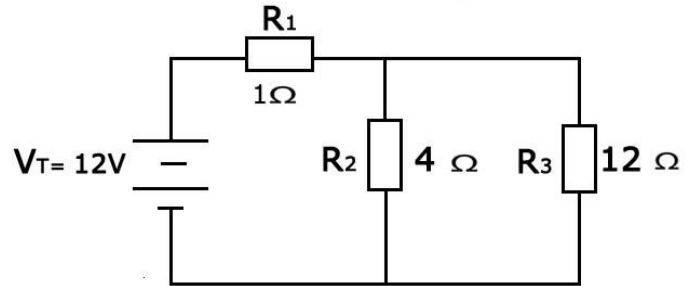
Explain the purpose of each of the components labelled.



6) Circuit puzzle

The circuit below has a 4 Ohm and 12 Ohm resistor in parallel.

- Show that the combined resistance of these two resistors is 3 Ohms?
- What is the resistance of the circuit?
- What is the current in the circuit?
- What is the potential difference across the 1 Ohm resistor?
- What is the potential difference across the two parallel resistors?
- How much current flows through the 4 Ohm resistor and how much through the 12 Ohm resistor.



7) Circuit breakers

The fuse box in a house may contain fuses or it may contain circuit breakers.

- Explain what the fuses/circuit breakers do and what this protects against.
- Explain the advantage of a circuit breaker compared to a fuse.

For extra safety you can have residual current devices (RCB) or residual current circuit breakers (RCCB) in some circuits. [They are the same thing]

- The RCB works by comparing the current in which two wires?
- In normal operation how does the current in these two wires compare?

8) Kilowatt hours and paying for electrical energy

If a 2kW heater is switched on for 10 hours.

- How many kWh of electrical energy has been used?
- If this costs the user £2 what is the cost per kWh or unit of electricity?
- How many joules of electricity is 1 kWh?

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