Y9 Electric Circuits

What you need to know:

a) Electrical charges can move easily through some substances, for example metals.

b) Electric current is a flow of electric charge.

c) The relationship between current **I**, charge **Q** and time **t** is: $I = Q / t$

Your teacher may use either of the terms **potential difference** or **voltage**. Questions will be set using the term potential difference. You will gain credit for the correct use of either term.

d) Circuit diagrams use standard symbols.

You will be required to interpret and draw circuit diagrams. You should know the following standard symbols:
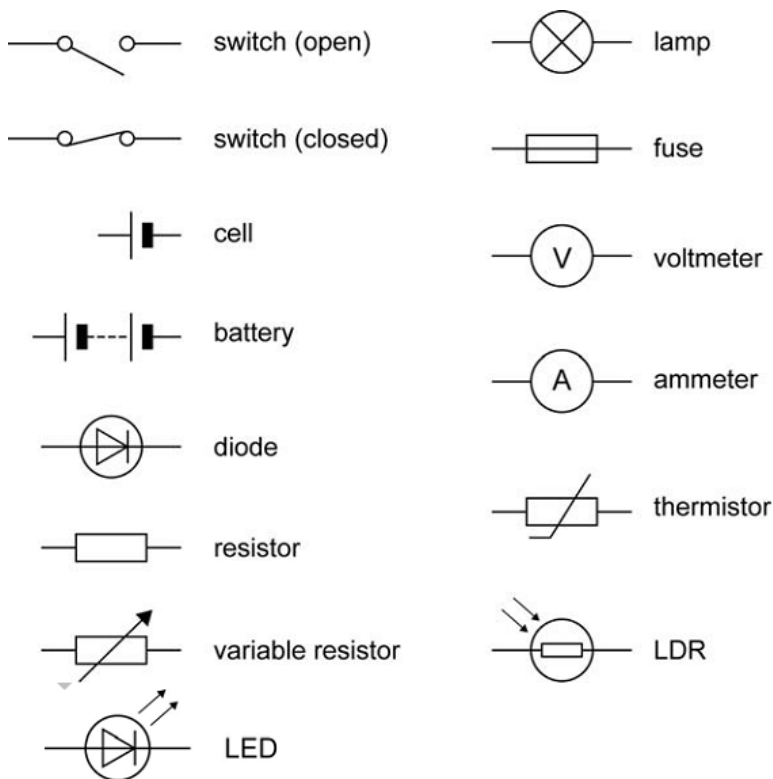

You should understand the use of thermistors in circuits, for example thermostats.

You should understand the use of light-dependent resistors (LDRs) in circuits, for example switching lights on when it gets dark.

e) Current–potential difference graphs are used to show how the current through a component varies with the potential difference across it.

f) The resistance of a component can be found by measuring the current through and potential difference across, the component.

g) The current through a component depends on its resistance. The greater the resistance the smaller the current for a given potential difference across the component.

h) The relationship between potential difference **V**, current **I** and resistance **R** is: $V = I \times R$

i) The current through a resistor (at a constant temperature) is directly proportional to the potential difference across the resistor.

Current

Potential difference
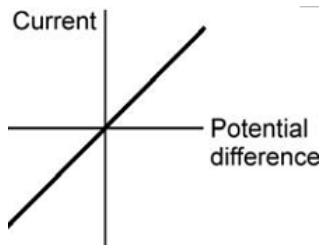
j) The resistance of a filament bulb increases as the temperature of the filament increases.

Current

Potential difference
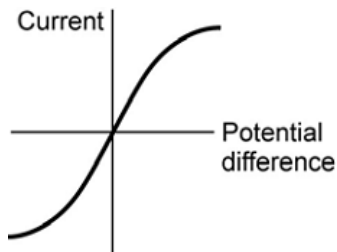
You should be able to explain change in resistance in terms of ions and electrons.

k) The current through a diode flows in one direction only. The diode has a very high resistance in the reverse direction.

Current

Potential difference
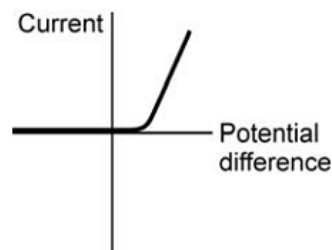
l) The potential difference provided by cells connected in series is the sum of the potential difference of each cell (depending on the direction in which they are connected).

m) For components connected in series:

- the total resistance is the sum of the resistance of each component
- there is the same current through each component
- the total potential difference of the supply is shared between the components.

n) For components connected in parallel:

- the potential difference across each component is the same
- the total current through the whole circuit is the sum of the currents through the separate components.

o) When an electrical charge flows through a resistor, the resistor gets hot.