

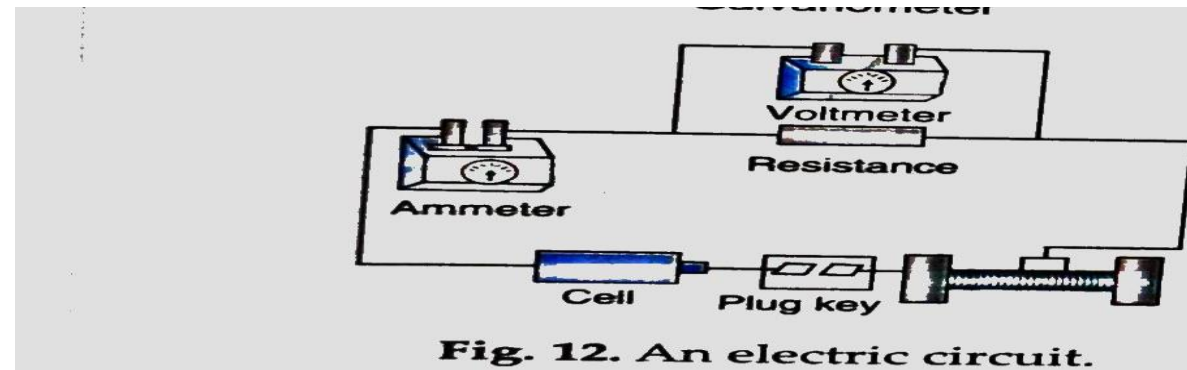
A red speech bubble with a white outline and a small tail pointing downwards. The text "Electric circuit" is centered inside the bubble in a white, sans-serif font. The background features faint, light gray concentric circles and dashed lines, suggesting a technical or scientific theme.

Electric circuit

## Electric circuit

1. open circuit
2. closed circuit

- A closed conducting path containing a cell, a resistor, switch and through which an electric current flows is called an electric circuit.
- When no current flows through an electric circuit then it is said to be an open circuit. This happens when the key is open which creates a break in the conducting path.
- When the key is closed, then the circuit is called a closed circuit. This means current would flow through the circuit to operate the device.
- It is difficult to draw a circuit diagram with various components used in a circuit. To ease the process, so we will use some standard symbols.

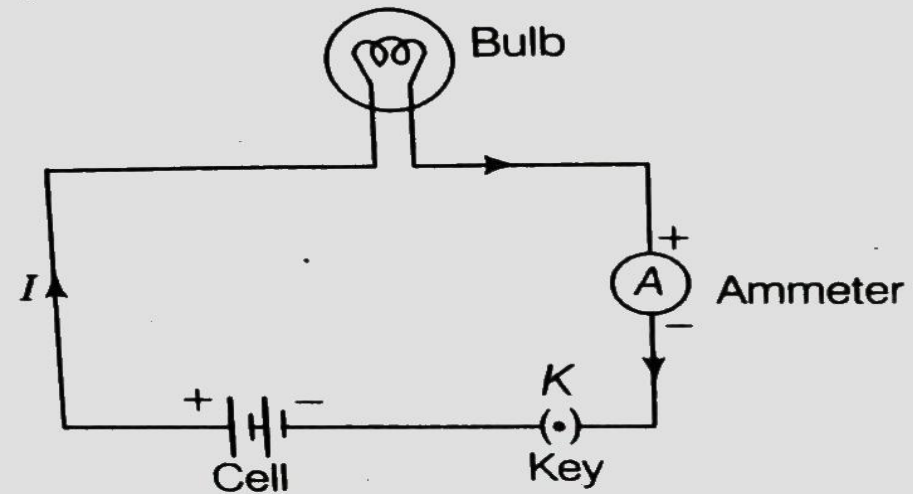


# Different electric components and their symbols

COMPONENT	CIRCUIT SYMBOL	FUNCTION OF COMPONENT
Wire		<p>To conduct or pass current from one part of a circuit to another. A 'blob' should be drawn where wires are connected (joined), but it is sometimes omitted. Wires connected to another wire should be staggered slightly to form two T-junctions, as shown. Such help to transmitted current to other paths.</p> <p>In diagrams, it is often necessary to draw wires crossing even though they are not connected. It is preferred to have the 'hump' symbol as shown because the simple crossing of the wire may be misread as a joint where you have forgotten to add a 'blob'.</p>
Wire joined		
Wires not joined		
 Cell		<p>Supplies electrical energy.</p> <p>The larger terminal is marked as '+' to represent the anode and smaller terminal is marked as '-' to represent the cathode. A single cell is often interpreted and called a battery, but a battery is two or more cell joined together.</p>
 Battery		<p>Supplies electrical energy.</p> <p>A battery is a combination of 2 or more cells.</p>
 Fuse		<p>A safety device, which will melt if the current flowing through it exceeds a specified value.</p>
 Voltmeter		<p>A voltmeter is used to measure voltage (potential difference).</p>
 Ammeter		<p>An ammeter is used to measure electric current.</p>
 Bulb		<p>A device, which converts electrical energy to light.</p>
 Resistor		<p>A fixed resistor limits the current in the circuit.</p>
 Variable Resistor		<p>A variable resistor allows the current in a circuit to be varied.</p>
 Open switch		<p>A switch enables current in a circuit to be switched on or off. When the switch is open, the circuit is incomplete and no current flows.</p> <p>When the switch is closed, the circuit is complete and current flows.</p>
 Closed switch		

# Circuit Diagram

- It is a schematic diagram which represents the relative positions and connections of various circuit components represented by their symbols.



A schematic diagram of an electric circuit having cell, electric bulb, ammeter and plug key

## Points to remember

1. Potential difference between two points is measured by a device called voltmeter. The resistance of voltmeter is very high so it is always connected in parallel between the two points where  $V$  is required.
2. Current is measured by a device called ammeter. It has very low resistance and is connected in series.

# Home Assessment

- 1 If a body has positive charge, then what does it mean?
- 2 In which direction does current flow in an electric circuit?
- 3 The charge on an electron is  $1.6 \times 10^{-19} \text{C}$ . Find the number of electrons that will flow per second to constitute a current of 2A.  
[Ans.  $125 \times 10^{19}$  electrons]
- 4 Write a low resistance device name which is always connected in series with the device through which the current is to be measured.
- 5 If work done in moving a charge of 20 mC from infinity to a point O in an electric field is 15 J, then what is the electric potential at this point?  
[Ans.  $7.5 \times 10^2 \text{ V}$ ]
- 6 Write a high resistance device name which is always connected in parallel.