

### Circuits

are: Electrons flowing in a continual closed loop.

**Parts of a circuit**

1. Power supply: gives the **push** the electrons need to travel in the circuit.
2. Wires: Allow the **conduction** of electrons and connects all the parts of the circuit.
3. Control or switch: **controls** the ability for electrons to travel in a circuit. A magnetic switch is often used.
4. Fuses or breakers: **Protection**. Completely stops electron flow when too much is asked for.
5. Transformers: Device used to transfer electrical energy from one circuit to another or to transfer to another form of energy. Ex: light, sound or motor.
6. Resistors: Stop or slow down the flow of electrons in a circuit.

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### Symbols

Resistor	Light bulb	Wire	Open switch	Closed switch
Power supply	Fuse	Voltmeter	Ammeter	Motor

**voltmeter:** measures the voltage of the circuit.  
**ammeter:** measures the current intensity of the circuit.

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### Types of circuits

<p><b>Series</b></p> <p>one pathway</p> <p>Series Circuit</p>	<p><b>Parallel</b></p> <p>multiple pathways</p> <p>Parallel Circuit</p>
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### Symbols on a circuit

**Ammeter, switches and fuses:** All are placed the same way on a circuit, directly on a wire. Depending where they are placed they can control a part, parts or the whole circuit. The way they are placed is called in 'series'.

**Voltmeters:** Are placed in 'parallel' which means above or below the resistor or power supply.

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### Putting it all together

Example 1:

- Circuit with one pathway
- 4 light bulbs
- Voltmeter for total voltage, (Vs)
- Voltmeter for L<sub>1</sub>, (V<sub>1</sub>)
- Voltmeter for L<sub>2</sub> and L<sub>3</sub> together, (V<sub>2</sub>)
- Voltmeter for L<sub>4</sub>, (V<sub>3</sub>)
- Ammeter for total current, (A<sub>1</sub>)
- Ammeter for current of L<sub>1</sub>, (A<sub>2</sub>)
- Fuse for the whole circuit.
- Fuse for L<sub>3</sub>
- Switch for L<sub>1</sub>
- Switch for all lights

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Example 2:

- Circuit with 4 pathways with resistors
- Voltmeter for total voltage, (Vs)
- Voltmeter for R<sub>2</sub>, (V<sub>2</sub>)
- Ammeter for total current, (As)
- Ammeter for R<sub>3</sub> and R<sub>4</sub> together, (A<sub>1</sub>)
- Fuse for the whole circuit
- Fuse for R<sub>2</sub>
- Fuse for R<sub>3</sub> and R<sub>4</sub> together
- Fuse for R<sub>4</sub>
- Switch for R<sub>3</sub>
- Switch for R<sub>4</sub>
- Switch for whole circuit

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