

Resistance

Electrical resistance is the _____ of movement of electrons as they flow through a circuit.

Measure in _____.

Factors that affect resistance

i) _____: If the material is a good conductor, resistance is _____ and electrons can travel _____

ii) _____: The greater the cross-sectional area, the _____ the resistance

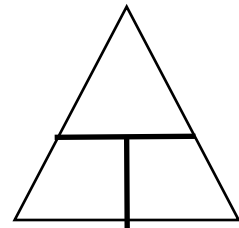
iii) _____: The longer the wire the _____ the resistance value

iv) _____: The cooler the substance, the _____ the resistance

Resistance is measured using an _____. It is connected _____ with the load. They are represented by the symbol:

Ohm's Law:

- Current (I) is measured in _____
- Voltage (V) is measured in _____
- Resistance (R) is measured in _____
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- Ohm's law states that as the potential difference across the load increases, so does the _____.

Sample Calculation:

A 110 Ohm resistor is connected to a power supply set at 1.2V . Calculate the current going through the resistor.

Parallel and Series Circuits

Loads in series

Two circuits are made using light bulbs with a resistance of 5 Ohms. For each circuit, the battery has a potential difference of 10V. The first circuit has one bulb and the second has three bulbs connected in series.

Circuit 1	Circuit 2
Draw circuit diagrams for each of the circuits	
Calculate the total resistance for each circuit (electrons travel through all loads)	
Calculate the current for each circuit	
Calculate the voltage for each circuit	

Conclusions:

When loads are added in series

- The resistance _____
- The current _____
- The voltage _____

Loads in parallel

Two circuits are made using light bulbs with a resistance of 5 Ohms. For each circuit, the battery has a potential difference of 10V. The first circuit has one bulb and the second has three bulbs connected in parallel.

Circuit 1	Circuit 2
Draw circuit diagrams for each of the circuits	
Calculate the total resistance for each circuit (electrons travel through one load)	
Calculate the current for each circuit	
Calculate the voltage for each circuit	

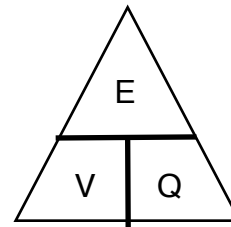
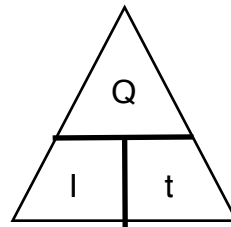
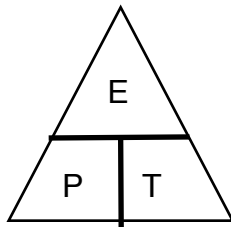
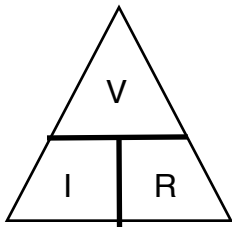
Conclusions:

When loads are added in parallel

- The resistance _____
- The current _____
- The voltage _____

Practice Quiz

<p>Draw a series circuit containing 3 loads, a switch, and 1 cell battery. Be sure to indicate electron flow.</p>	<p>Draw a parallel circuit containing 2 loads, a switch, and 3 cell battery. Be sure to indicate electron flow.</p>
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<p>A 1.2 A current is measured in a wire. What is the charge to pass through that wire in a 3 minute period?</p> <p>Given:</p> <p>Required:</p> <p>Solution:</p>	<p>A lamp has a voltage of 120 V and has a charge of 12 Coulombs. How much energy does the lamp use?</p> <p>Given:</p> <p>Required:</p> <p>Solution:</p>
<p>An ammeter measured a charge of 0.8 A in a circuit over a 90 second period. What is the charge of this circuit?</p> <p>Given:</p> <p>Required:</p> <p>Solution:</p> <p>Therefore:</p>	<p>A space heater has a voltage of 120V and a current of 15A. What is the resistance of the space heater?</p> <p>Given:</p> <p>Required:</p> <p>Solution:</p> <p>Therefore:</p>