

An Autonomous Institution

Coimbatore-35

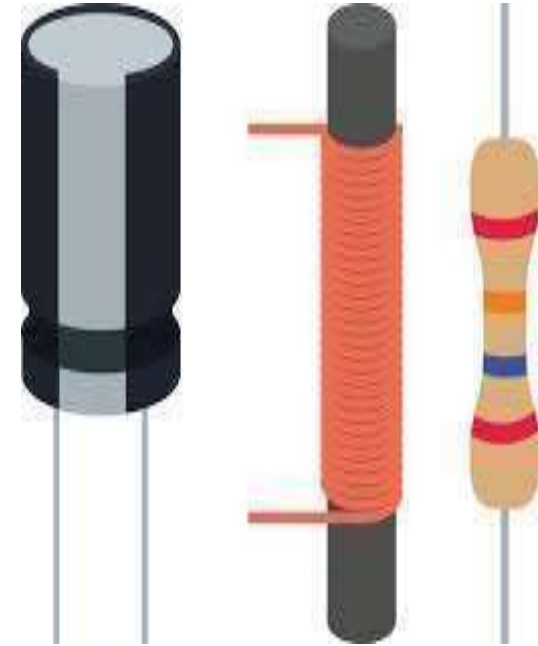
Department of Artificial Intelligence and Data Science

23EET103-Electric Circuits and Electron Devices

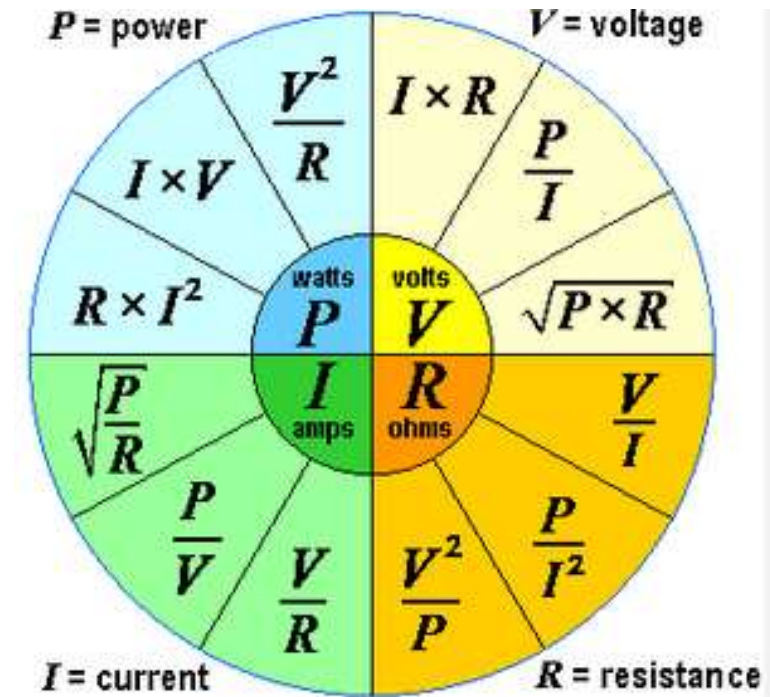
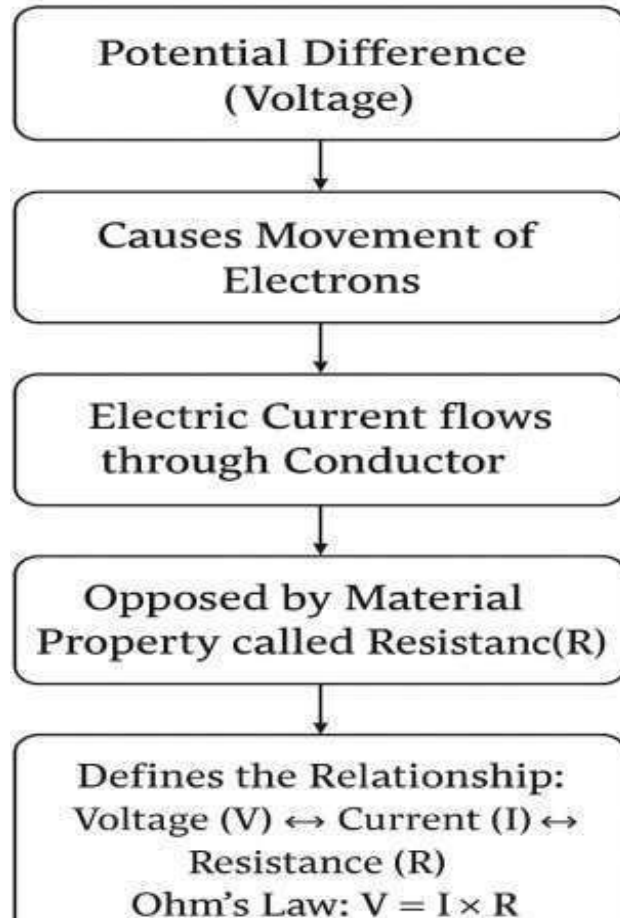
I B.Tech. IT / II SEMESTER

UNIT I : DC CIRCUITS

Topic 3 : Ohm's Law



Let's Recall !!



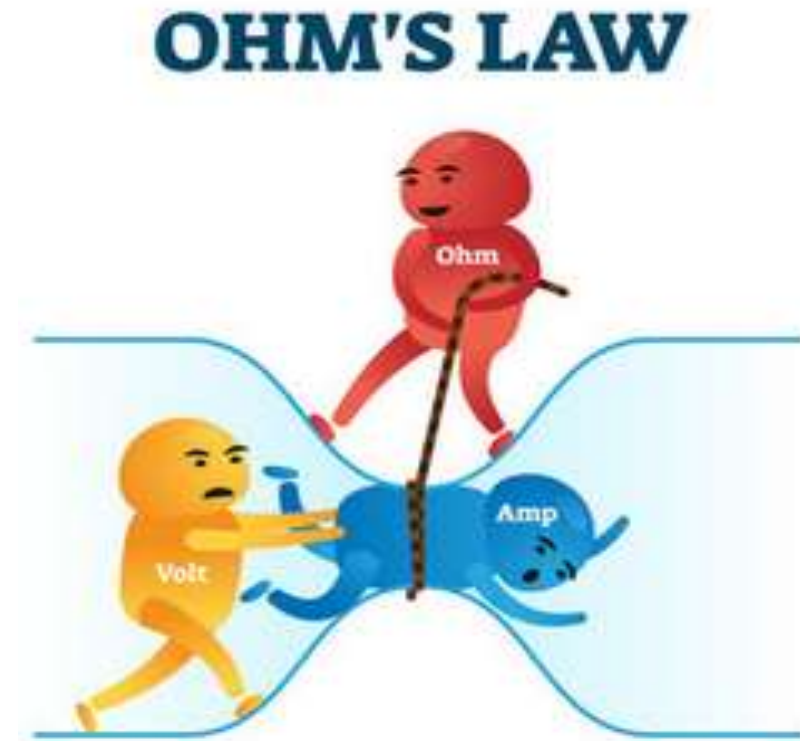
Topics for discussion

- Why Ohm's Law?
- Fundamentals of Voltage, Current, and Resistance
- Ohm's Law – Definition and Mathematical Relation
- Ohm's Law Triangle – Finding Unknown Quantities
- Applications of Ohm's Law in Real Circuits

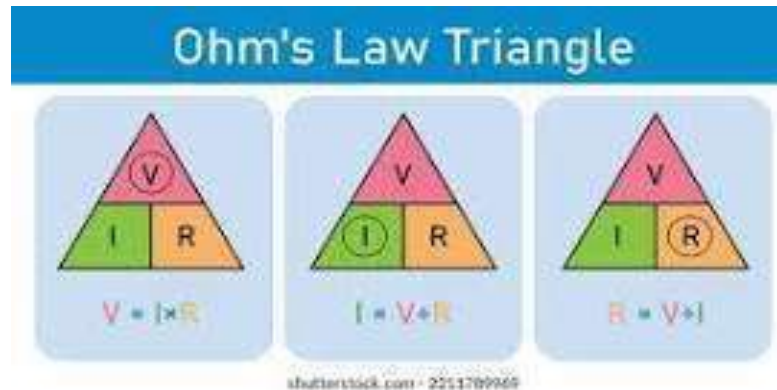
Ohms Law



German physicist Georg Simon Ohm.



Definition of Ohms Law

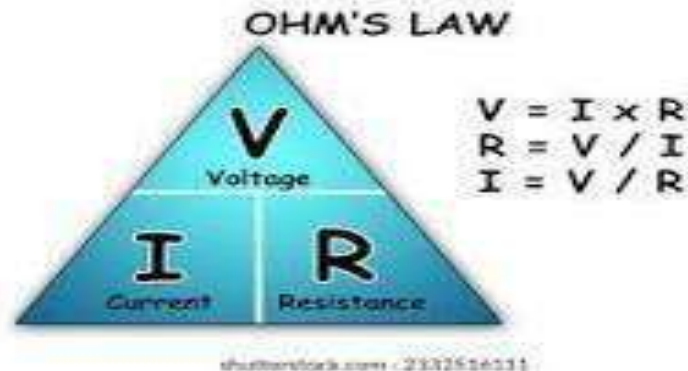


Ohm's Law states that the current flowing through a conductor between two points is directly proportional to the voltage across the two points, provided the temperature and physical conditions remain constant.

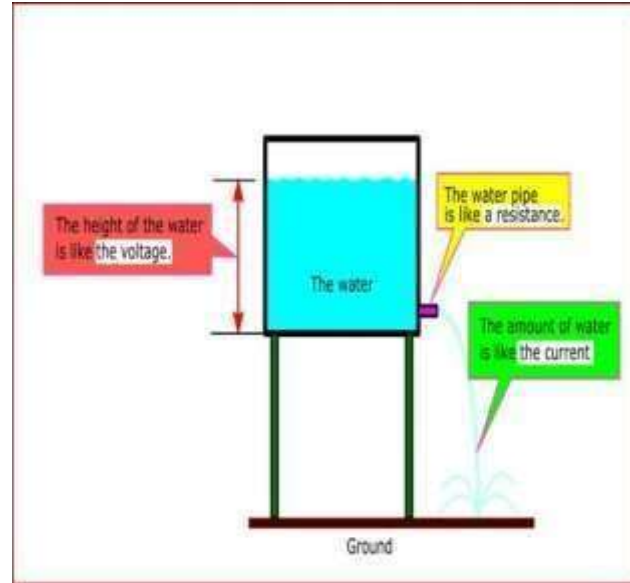
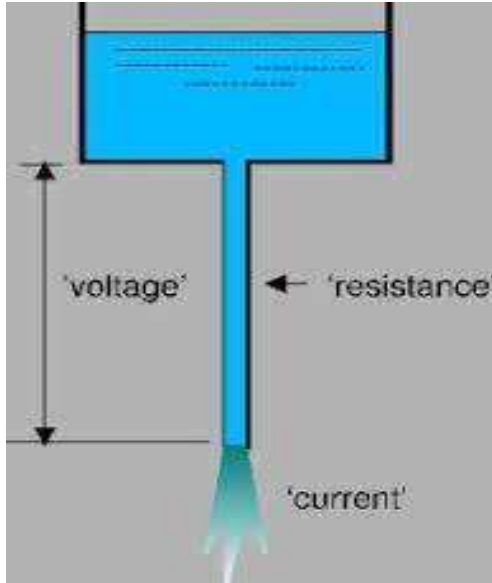
$$V = I \times R$$

Where

- **V** = Voltage (Volts)
- **I** = Current (Amperes)
- **R** = Resistance (Ohms)



Fundamentals of Voltage, Current, and Resistance



Voltage (V):

- The electric potential difference between two points.
- It pushes electrons through a conductor.
- Unit: Volt (V)

Current (I):

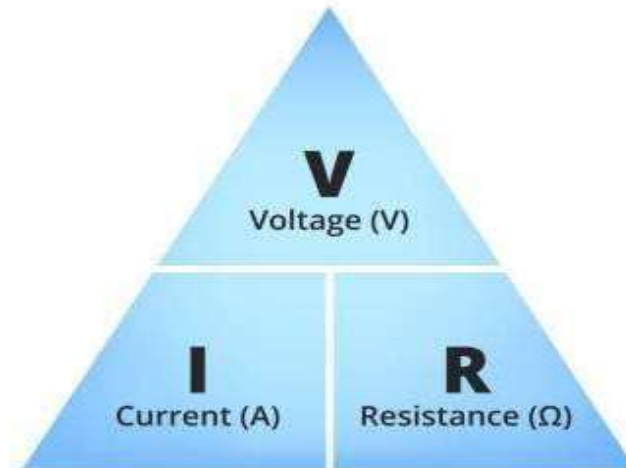
- The rate of flow of electric charge through a conductor.
- Direction: From positive to negative terminal (conventional current).
- Unit: Ampere (A)

Resistance (R):

- The opposition offered by a material to the flow of current.
- Depends on material, length, area, and temperature.
- Unit: Ohm (Ω)

Ohm's Law –Mathematical Relation

OHM'S LAW

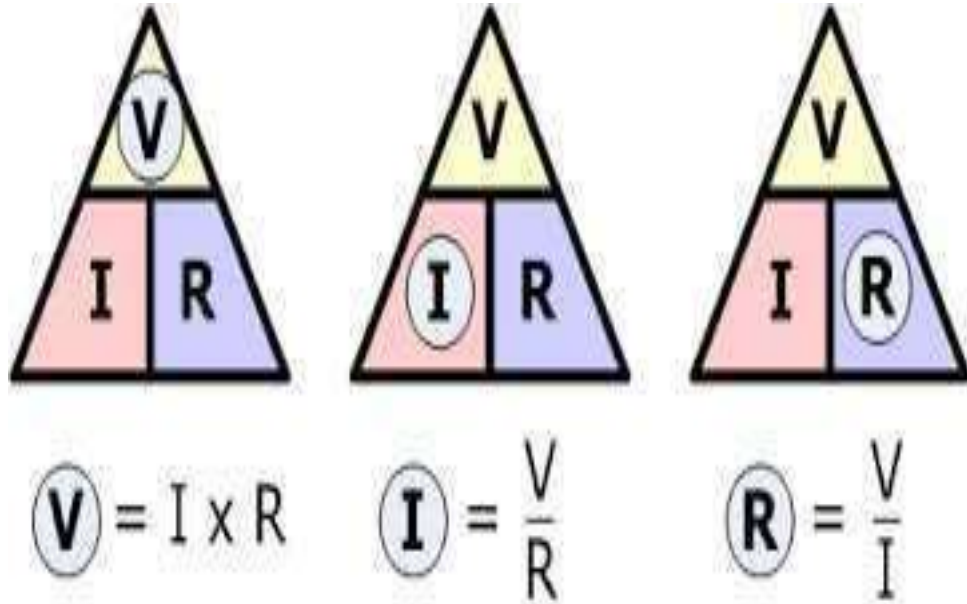


$$V = I \cdot R$$

$$R = V : I$$

$$I = V : R$$

Ohm's Law Triangle – Finding Unknown Quantities

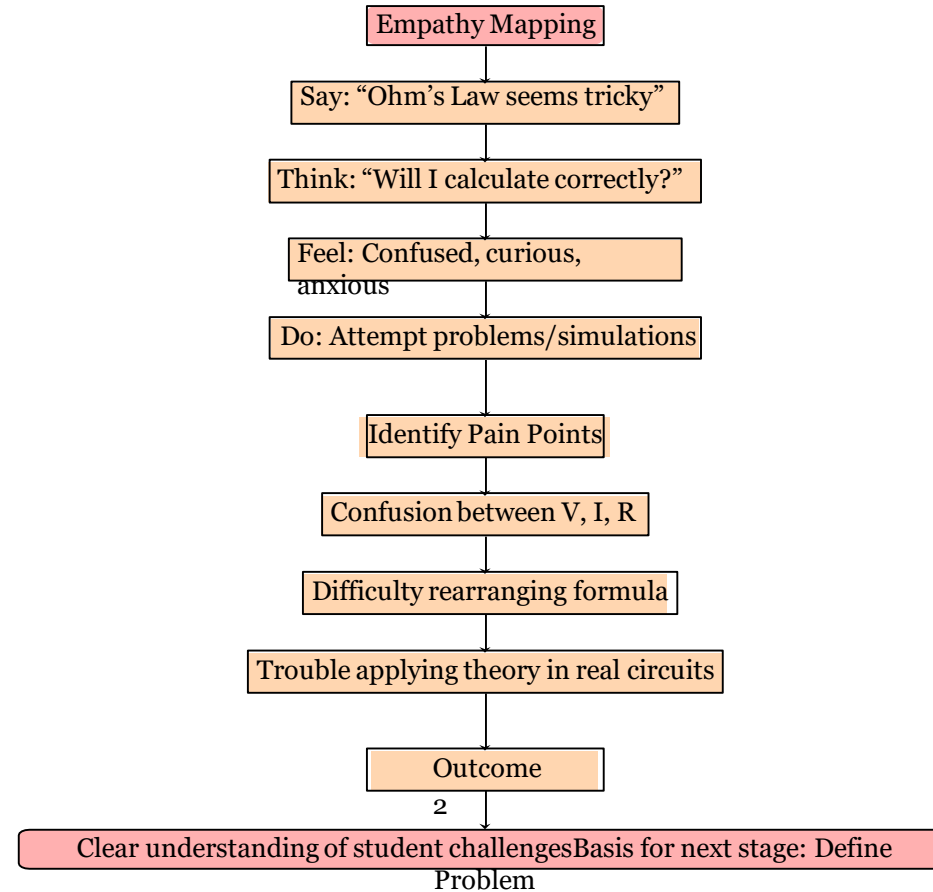


From the triangle:

- Voltage (V) = I × R
- Current (I) = V / R
- Resistance (R) = V / I

Ohm's law

**DT-
Empathize**

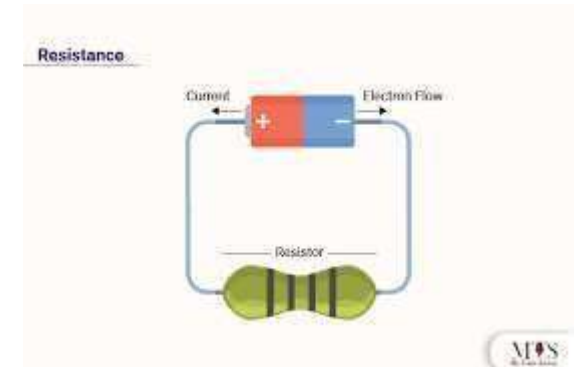
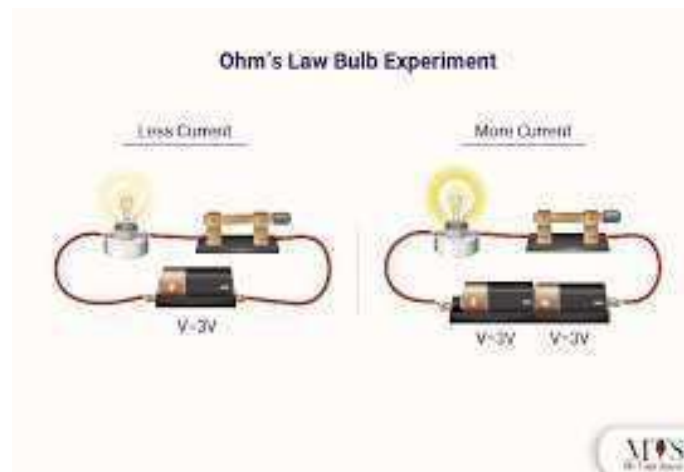
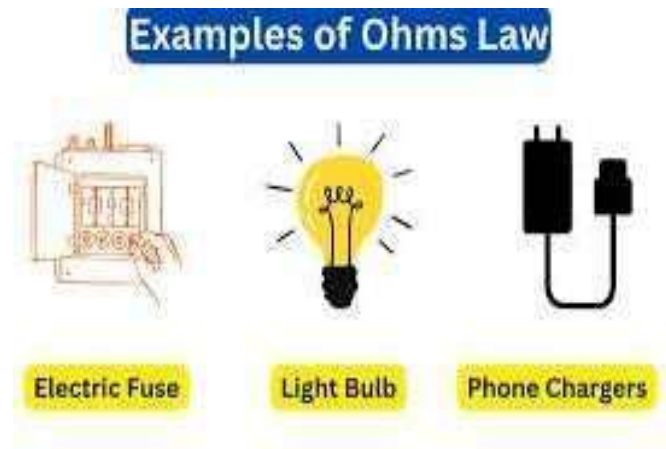


Ohm's Law

DT-Define

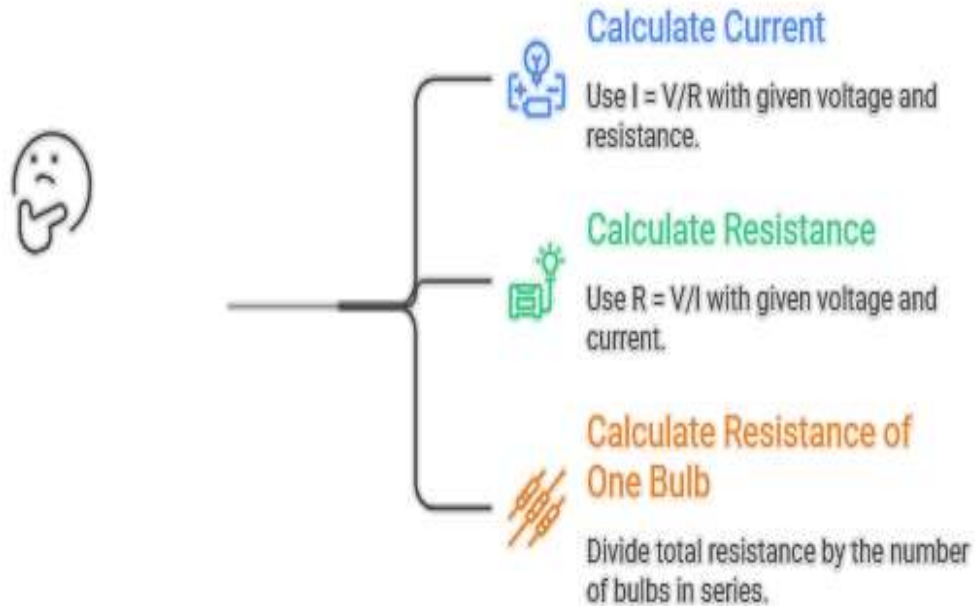
- In the Define stage of Design Thinking, the goal is to synthesize insights from the Empathy Mapping and Pain Points identified to articulate a clear problem statement that guides the development of solutions.
- Based on the provided empathy map and pain points, we will define the problem related to learning and applying Ohm's Law ($V = IR$).

Application of Ohms Law in Real world



Let's Summarize

How to solve problems using Ohm's Law?



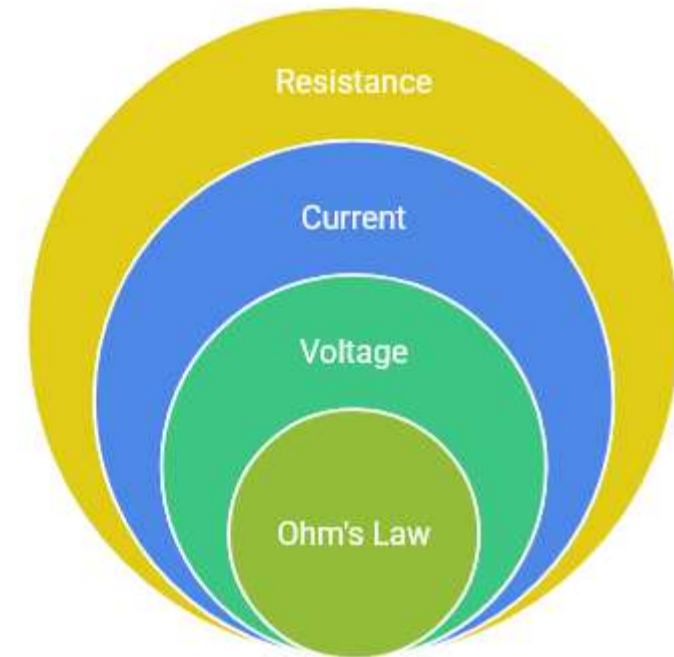
Ohm's Law Triangle

Opposition to current flow

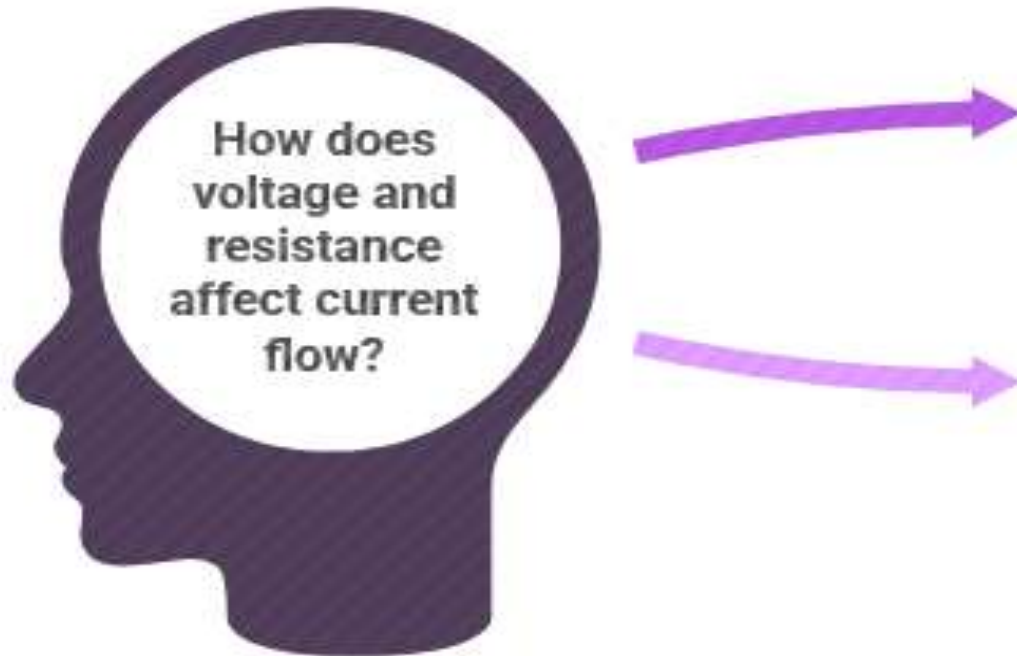
Flow of electrical charge

Electrical potential difference

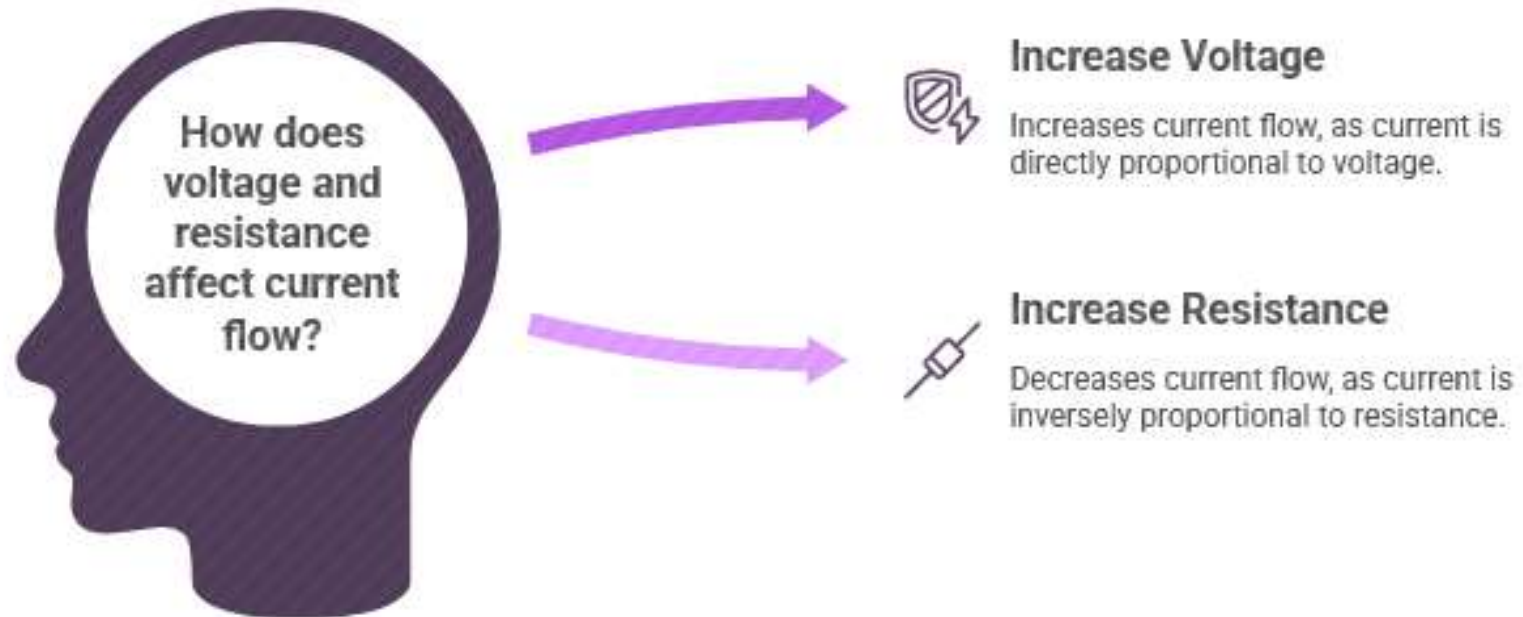
Fundamental principle of electricity



QUIZ

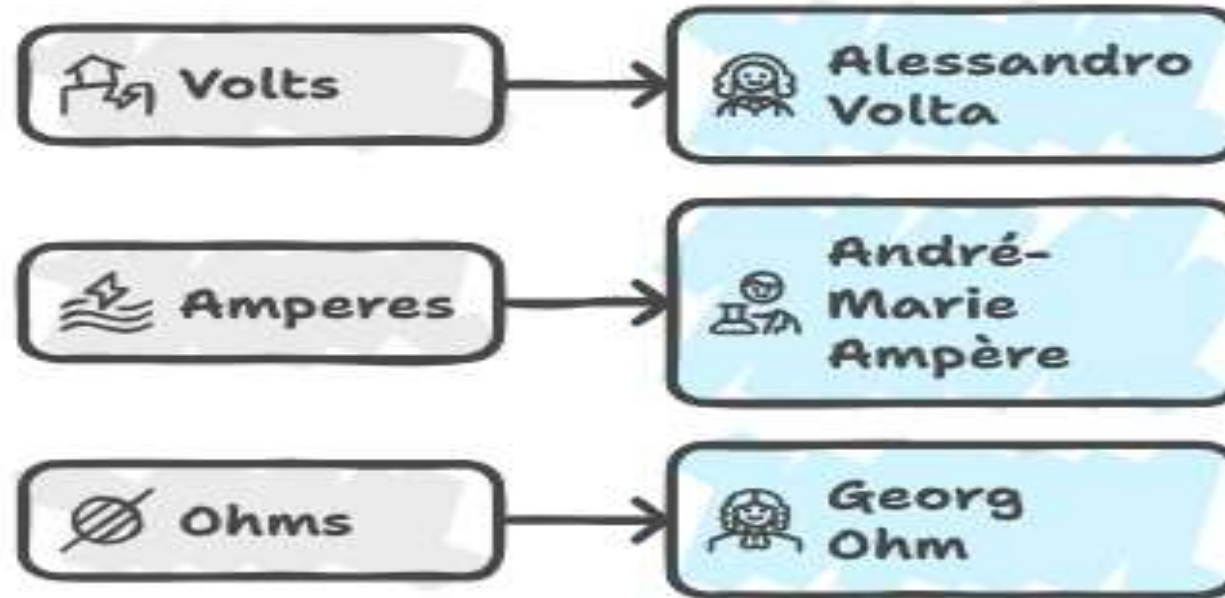


ANSWERS



ANSWERS

SI Units Named After Scientists





*Thank
you!*