



**SNS COLLEGE OF TECHNOLOGY**  
**An Autonomous Institution**  
**Coimbatore-35**



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

**23ECB101-CIRCUIT ANALYSIS AND DEVICES**

I YEAR/ II SEMESTER

**UNIT 1 – MESH AND NODE ANALYSIS OF ELECTRIC CIRCUITS**

**TOPIC – UNDERSTANDING OHM'S LAW AND DESIGN THINKING  
APPROACH**

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# Ohm's Law



## Empathy

- **Understanding Electrical Circuits:** Ohm's Law provides a foundational understanding of how voltage, current, and resistance are related in an electrical circuit. This understanding is essential for designing, analyzing, and troubleshooting electrical systems.
- **Predicting Behavior:** Ohm's Law allows engineers and scientists to predict how changes in voltage, current, or resistance will affect the behavior of an electrical circuit. This predictive capability is crucial for designing circuits to meet specific performance requirements.



# Ohm's Law



## Empathy

- **Troubleshooting:** When electrical circuits malfunction, Ohm's Law can be used to diagnose the problem. By measuring voltage, current, and resistance at various points in the circuit, engineers can identify where the issue lies and take appropriate corrective action.
- **Designing Efficient Systems:** Ohm's Law helps engineers design electrical systems that operate efficiently and safely. By understanding the relationship between voltage, current, and resistance, engineers can optimize circuit designs to minimize power loss and maximize performance.



# Ohm's Law



## Empathy

- **Safety:** Understanding Ohm's Law is essential for ensuring the safety of electrical systems and personnel. By calculating the voltage, current, and resistance in a circuit, engineers can identify potential hazards and implement appropriate safety measures to mitigate risks.
- Overall, Ohm's Law is indispensable for anyone working with electrical circuits, from designing complex electronic devices to maintaining electrical infrastructure. Its principles form the foundation of modern electrical engineering and are essential for advancing technology and innovation in various fields.



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# Ohm's Law



Define & Ideate



## Ohm's Law

One of the most basic and important laws of electric circuits is **Ohm's law**.

Ohm's law states that the voltage across a conductor is directly proportional to the current flowing through it, provided all physical conditions and temperatures remain constant.



# Ohm's Law



## Define & Ideate

Mathematically, this current-voltage relationship is written as,

$$V = IR$$

$$I = \frac{V}{R}$$

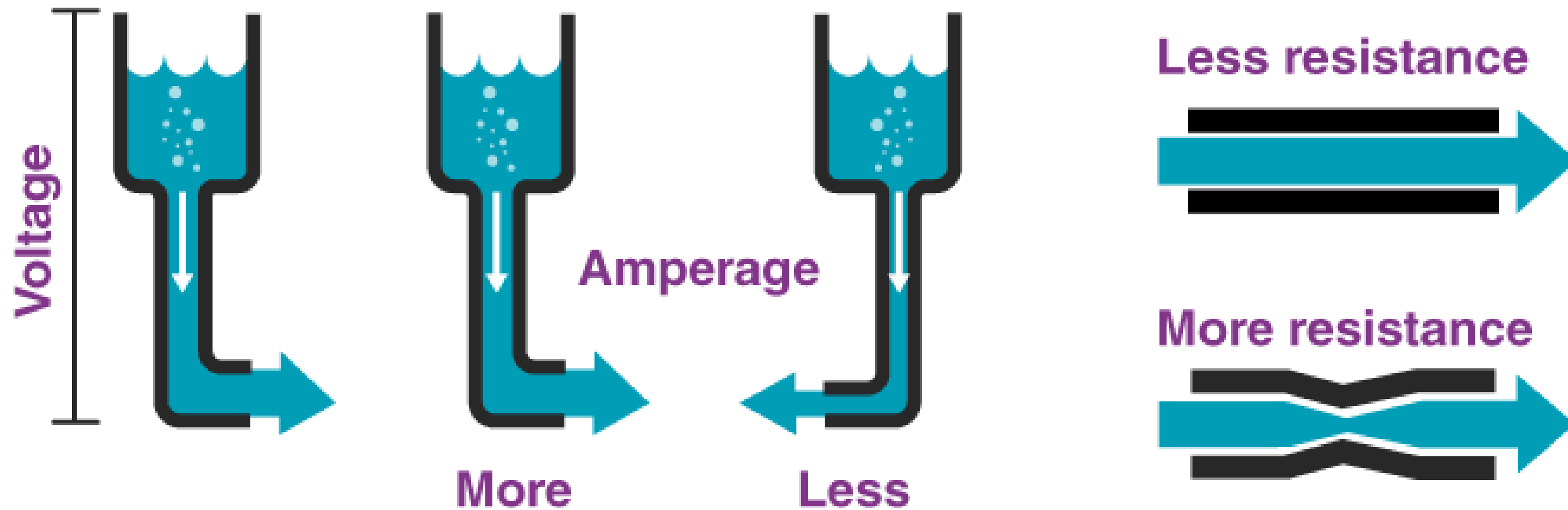
$$R = \frac{V}{I}$$



# Ohm's Law



Prototype

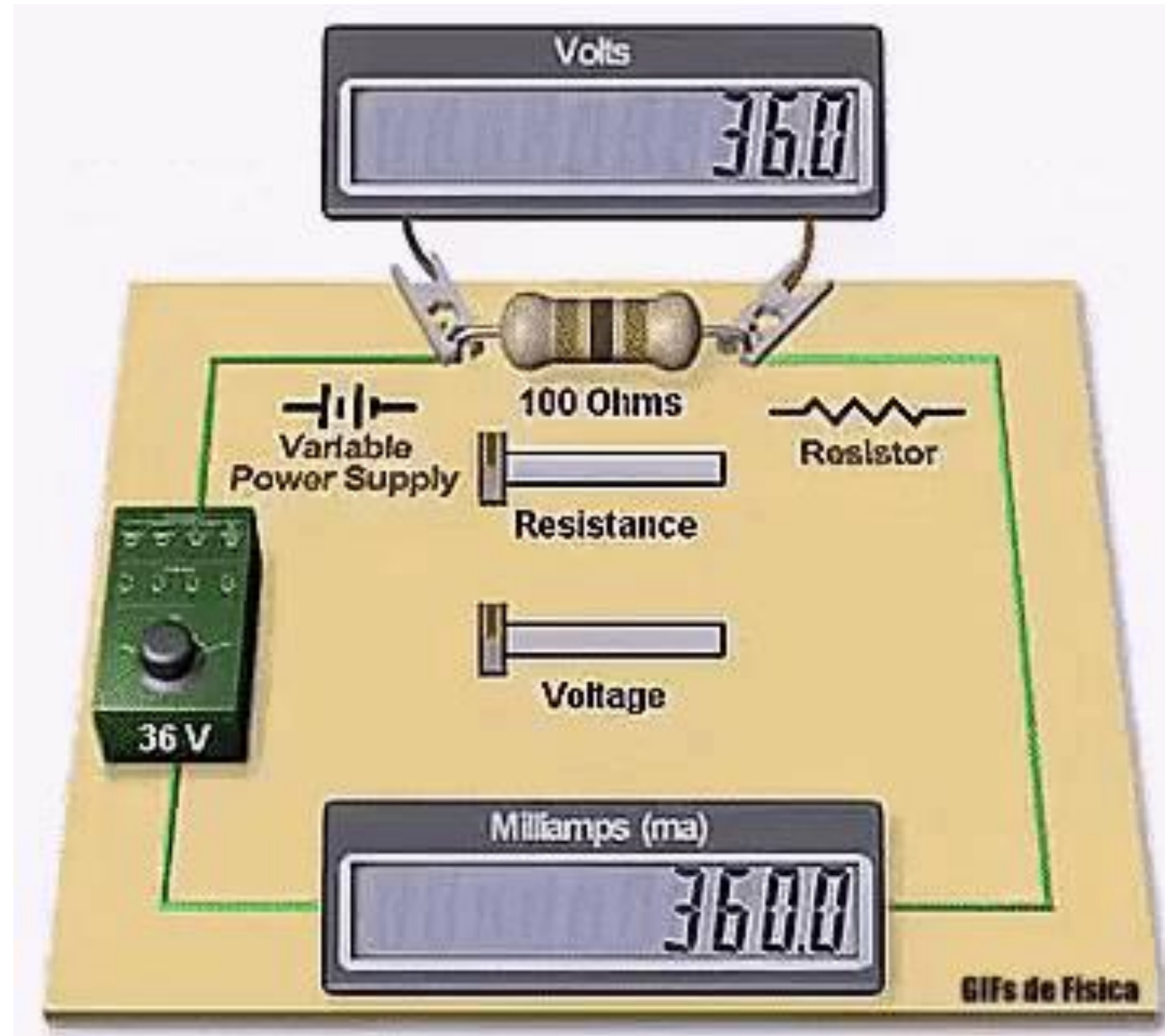






Testing

# Ohm's Law





**THANK YOU**