General Physics

Lecture One / Practical

Ohm's Law

First stage

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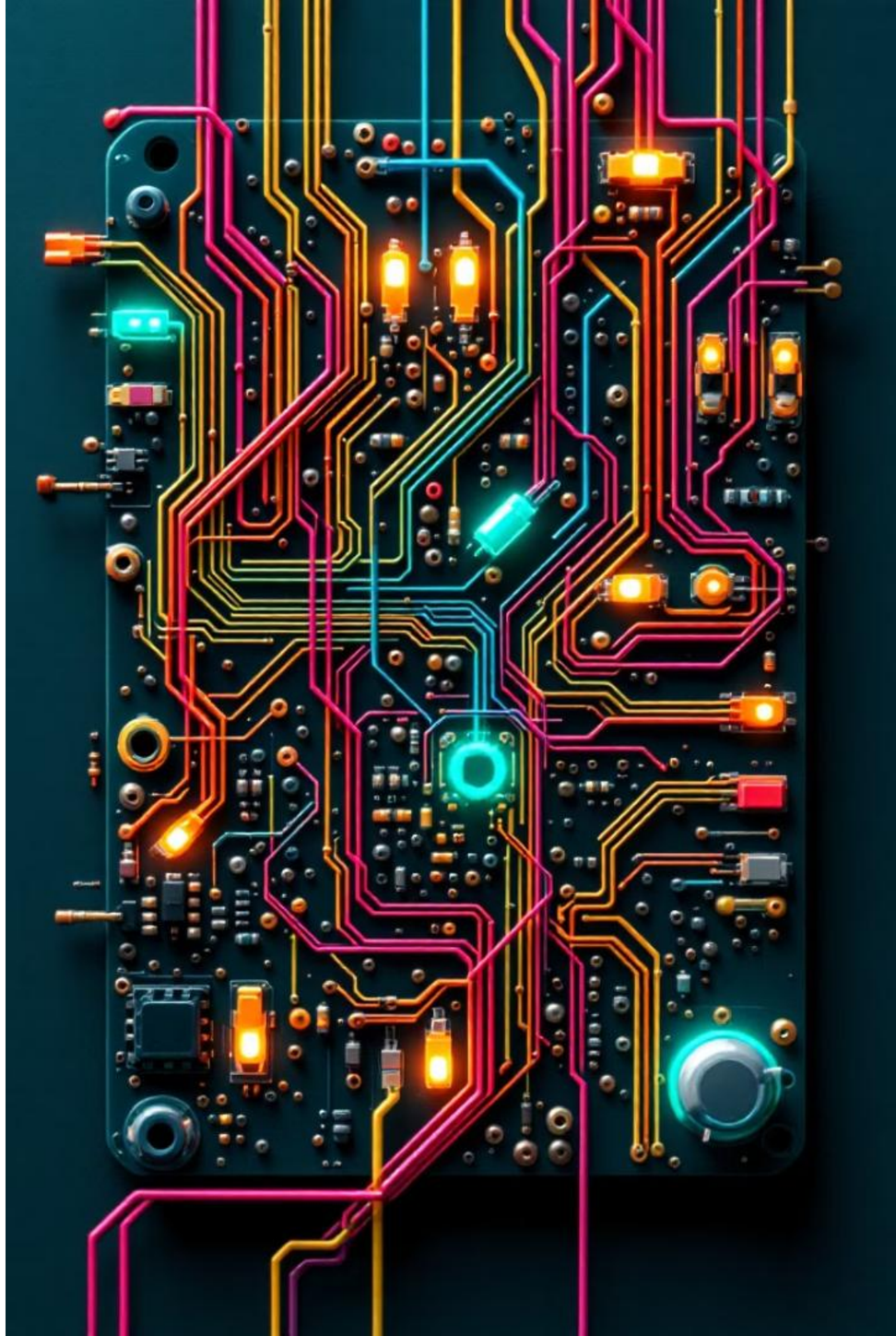
2024-2025



The Three Pillars of Ohm's Law

Voltage (V)

Voltage represents the electrical potential difference between two points in a circuit. It's like the pressure driving the flow of electrons, measured in Volts (V).

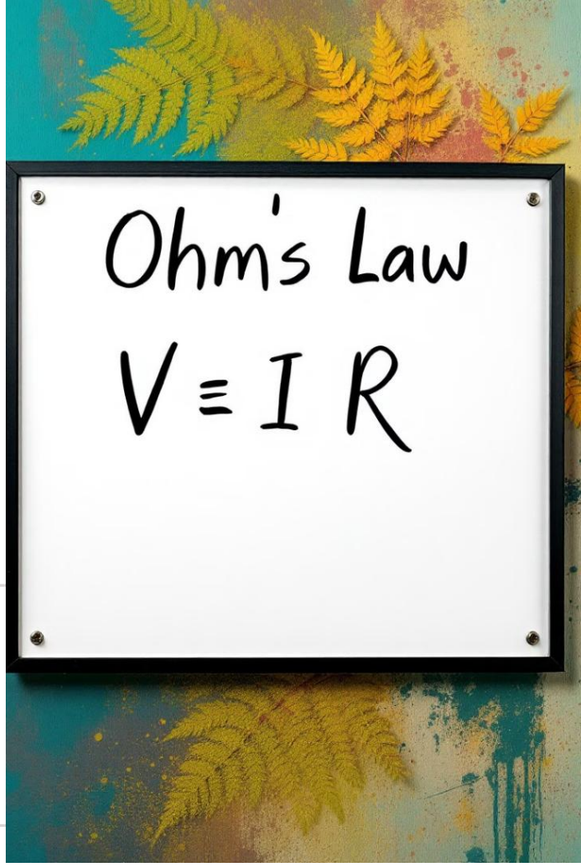
Current (I)

Current measures the rate of flow of electric charge through a conductor. It's like the amount of water flowing through a pipe, measured in Amperes (A).

Resistance (R)

Resistance is the opposition to the flow of electric current. It's like the size of the pipe restricting the water flow, measured in Ohms (Ω).

Ohm's Law Equation



1

V = I * R

2

Voltage (V)

3

Current (I)

The amount of charge flowing through a conductor.

4

Resistance (R)

The opposition to the flow of current.

Setting Up Your Circuit

1

1. Gather Materials

power Source, a resistor, a voltmeter, ammeter, and connecting wires.

2

2. Connect the Power Source

Attach the positive terminal of the power source to the positive rail of the breadboard and the negative terminal to the negative rail.

3

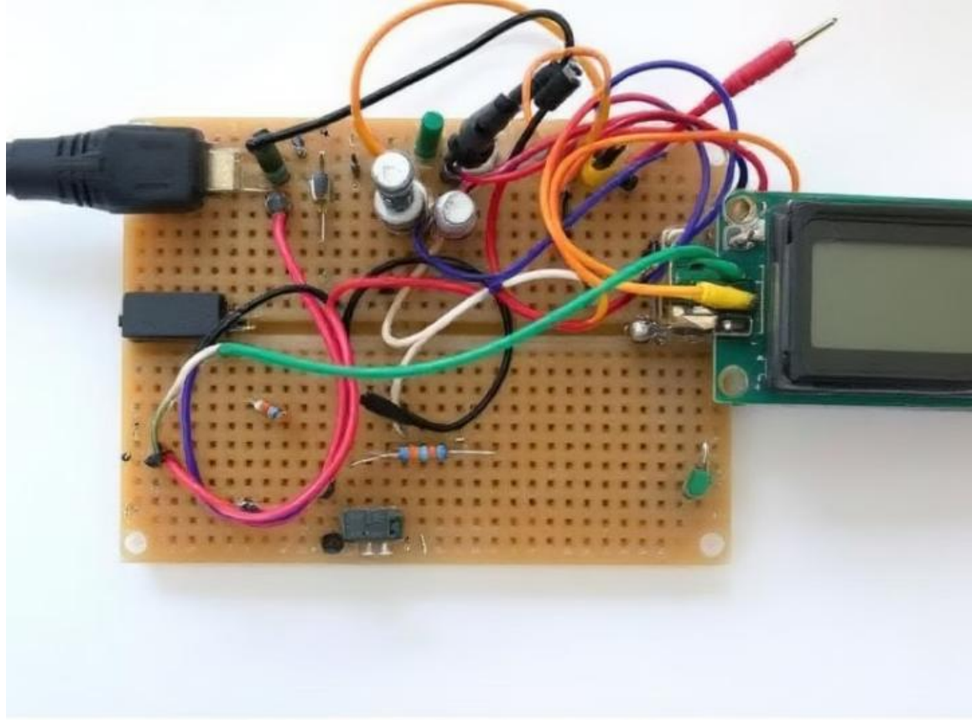
3. Connect the Resistor

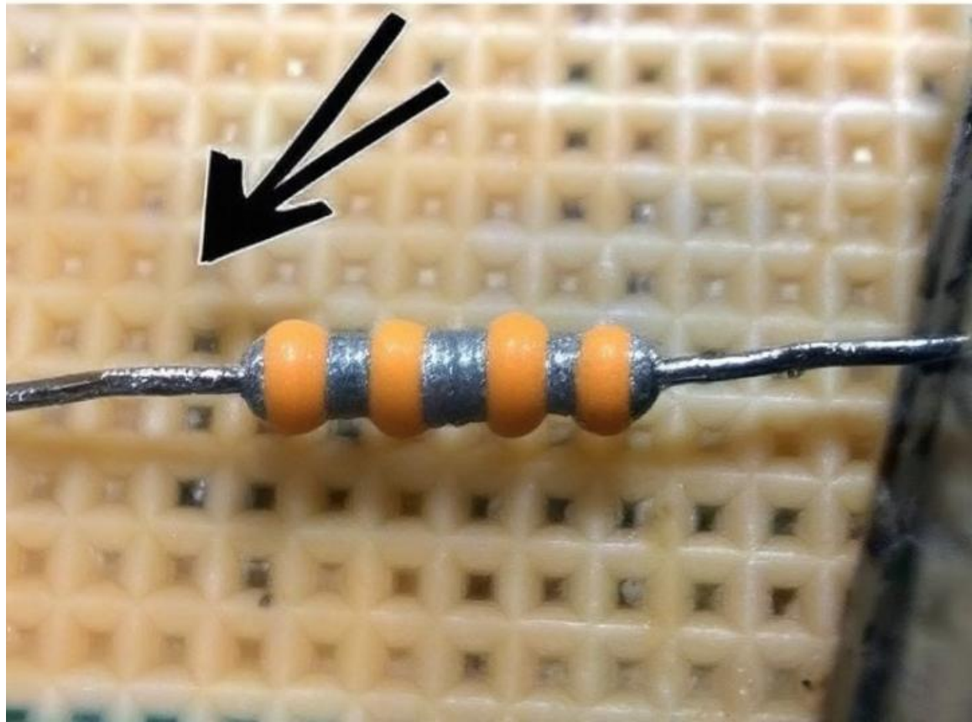
Place the resistor on the breadboard and connect its ends to the positive and negative rails of the breadboard.

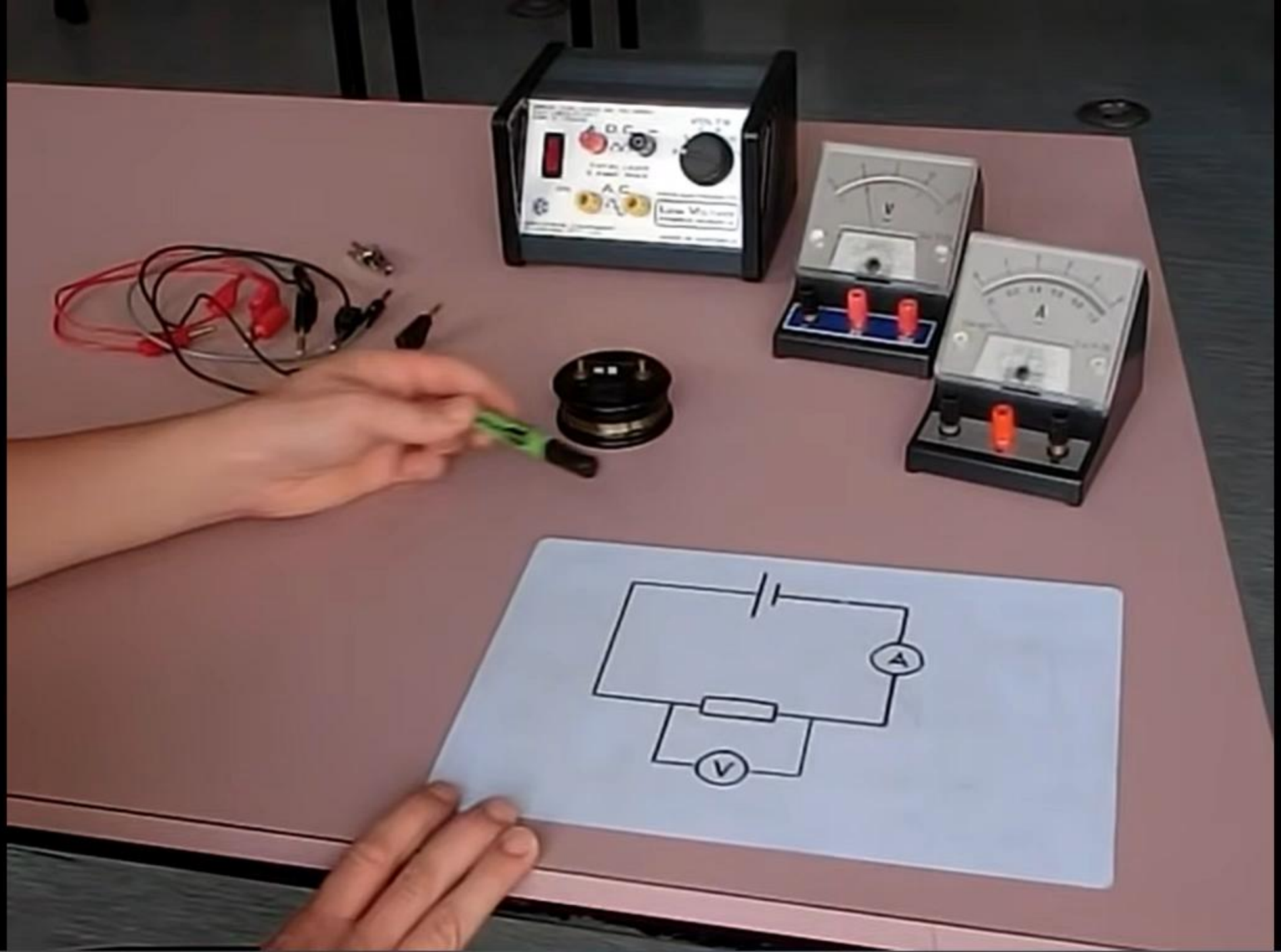
4

4. Connect the Voltmeter

Connect the positive probe of the voltmeter across the resistor (one probe on each end), and connect the negative probe to the negative rail of the breadboard.






DC
AC
V
A
A
V

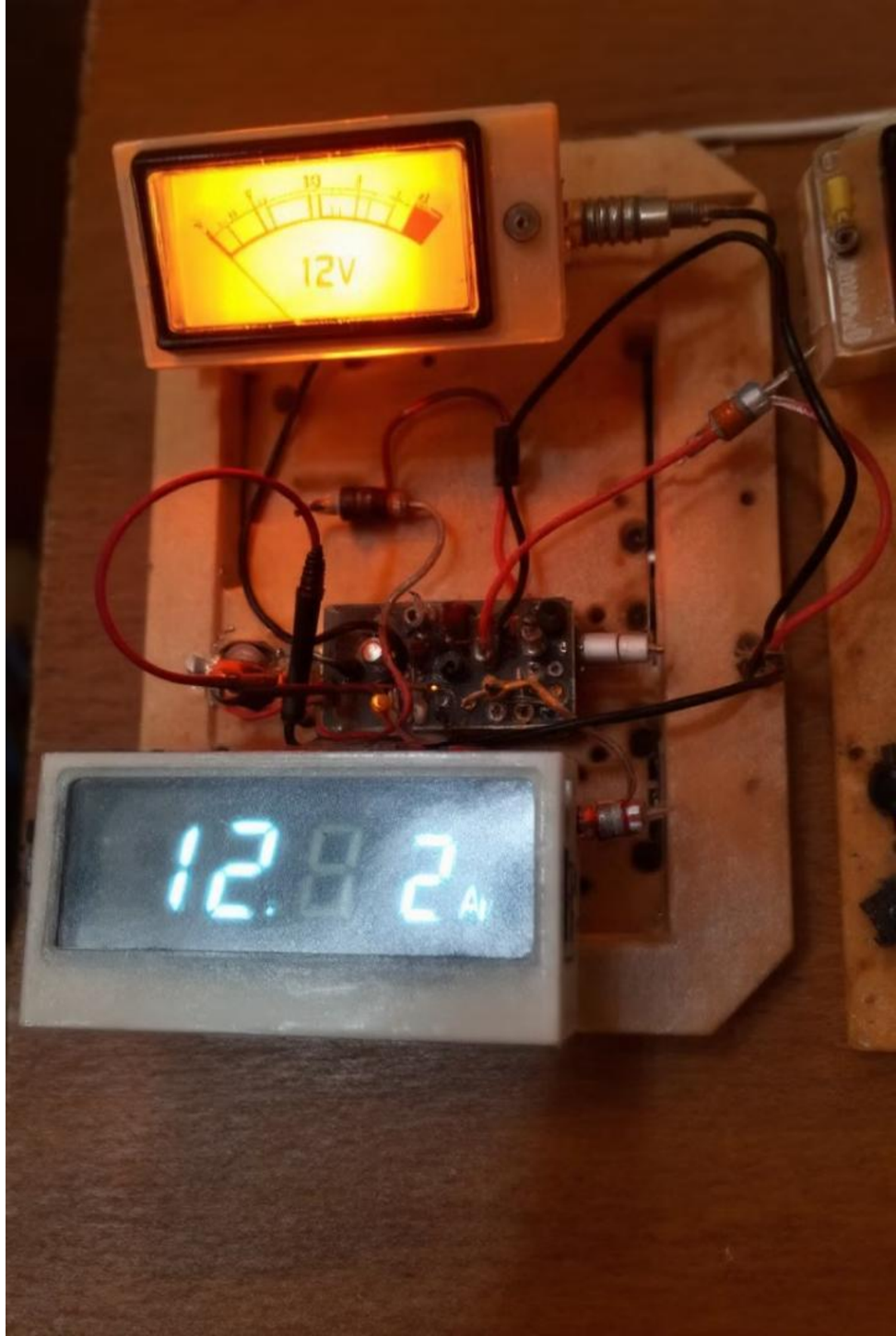
Measuring Voltage and Current

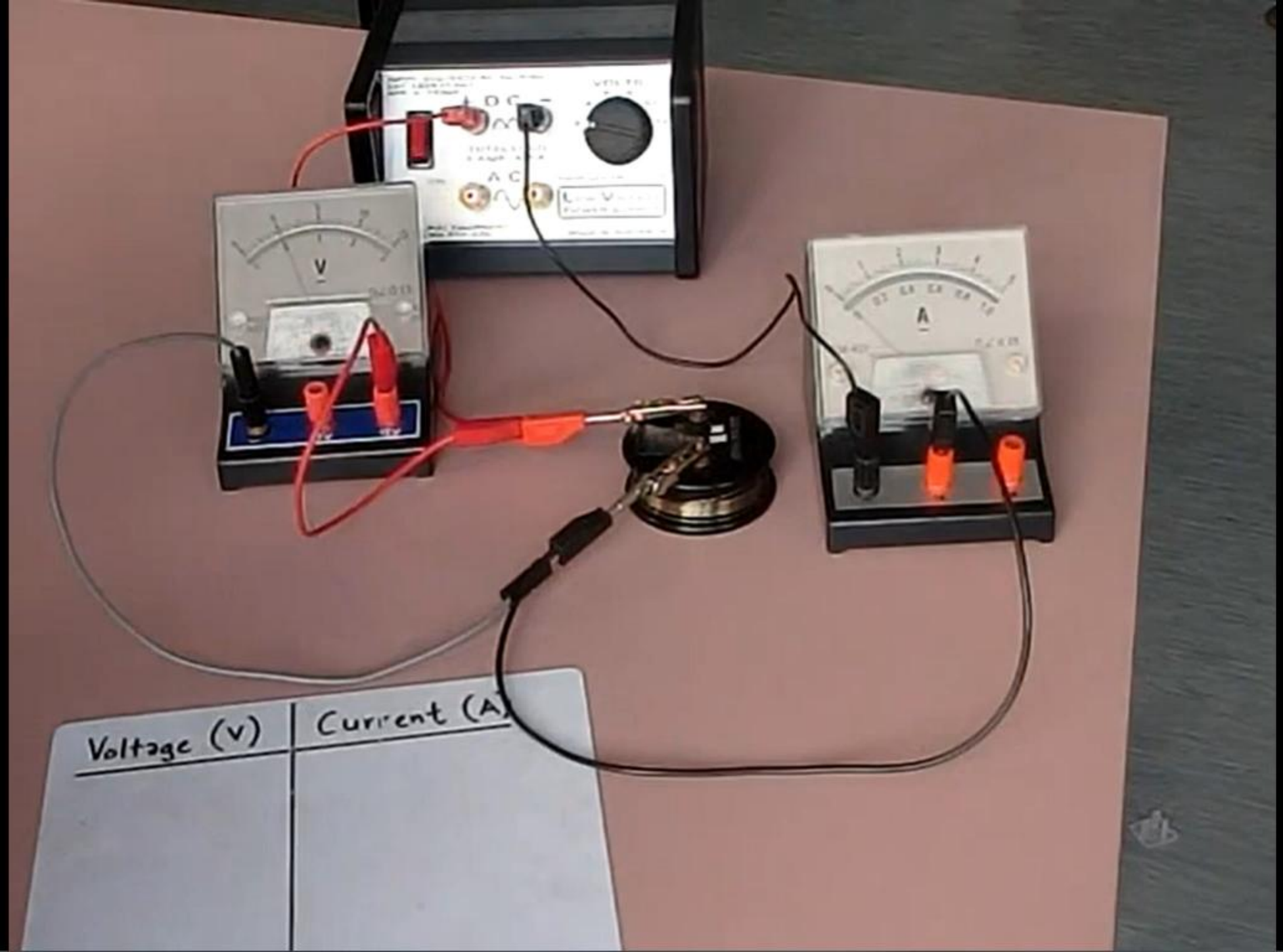
Voltage (V)

Measure the voltage across the resistor using the voltmeter. The voltmeter reading represents the potential difference across the resistor.

Current (I)

You'll need an ammeter to measure the current flowing through the circuit. Connect the ammeter in series with the resistor




V
A
Voltage (v)
Current (A)

Calculating Resistance

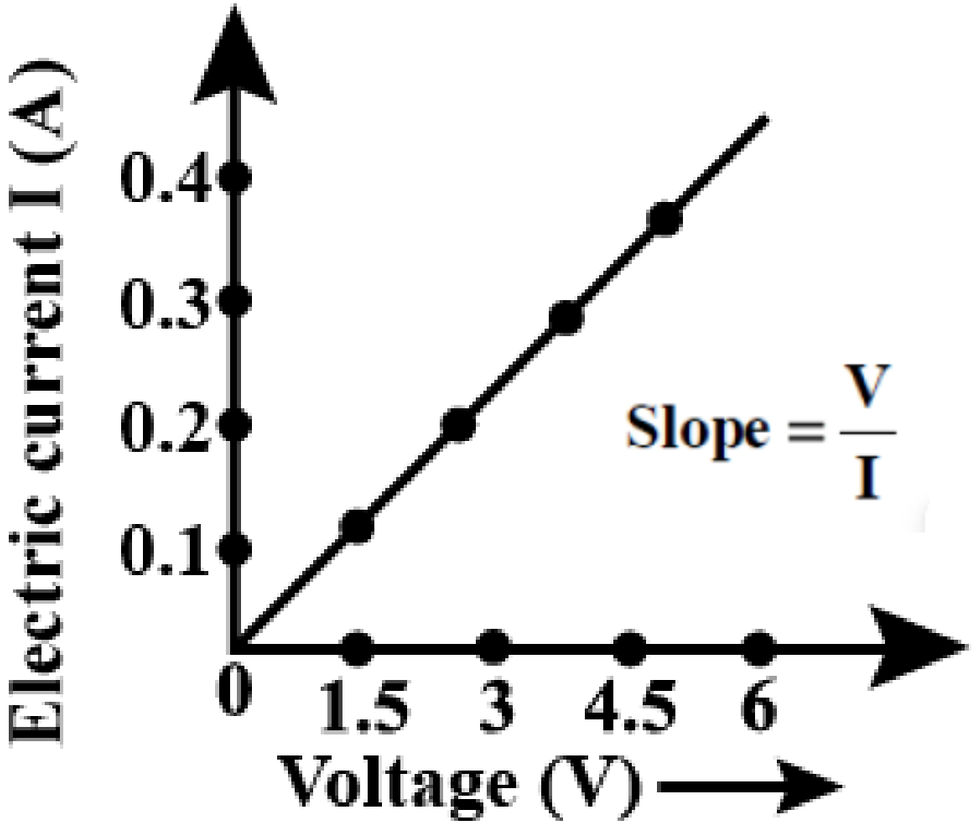
R

Resistance (R)

Use Ohm's Law (R = V / I) to calculate the resistance of your resistor. Divide the measured voltage by the measured current.

Plot a graph

Suppose you apply several different voltages across a circuit and measure the current that runs through the circuit. A plot of your results is shown in Figure (1). Draw the best straight line fit of the data. Determine the slope of the straight line which is the resistance in this case.



$$Slope = \frac{\Delta y}{\Delta x} = \frac{V}{I} = R$$

Choose the correct answer for all of the following

1. **The first sign refers to ……..**

(Current, Resistance, Voltmeter, Ammeter, Voltage supplier)

2. **The second sign indicates?**

(Resistance, Voltmeter, Key, Ammeter, Voltage supplier)

3. The third sign indicates……..

(Current, Voltmeter, Key, Ammeter, Voltage supplier)

4. The fourth sign indicates

(Current, Resistance, Voltmeter, Key, Ammeter)

5. The fifth sign indicates

(Current, Resistance, Voltmeter, Ammeter, Voltage supplier)

6. The sixth sign indicates

(Current, Resistance, Voltmeter, Ammeter, Voltage supplier)