

Ohm's Law Experiment

Purpose:

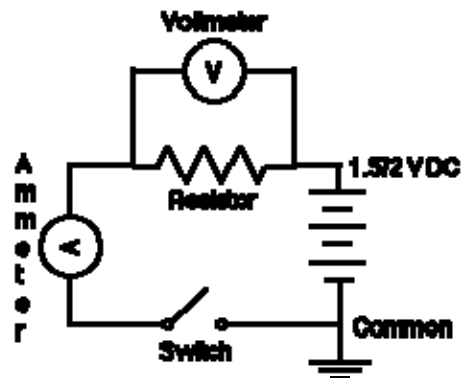
- to understand Ohm's Law questions on the Amateur Technician Exam
- to perform an experimental check of Ohm's Law
- to practice using an ammeter and a voltmeter

Discussion:

You will construct a simple circuit using a single known resistance, R . Then you will use an ammeter to measure the current, I , through the resistance and a voltmeter to measure the potential difference, E , across the resistance. With this data, you can check the validity of Ohm's Law ($E = IR$) in the circuit.

Equipment:

1.5/2 V power supply	"knife" switch	1.8 Ω , 5 Watt resistor
2.4 Ω 5 Watt resistor	5 Ω 5 Watt resistor	10 Ω 5 Watt resistor
25 Ω 5 Watt resistor	0-1 A ammeter	0-3 V voltmeter



Procedure:

Working in pairs prepare a matrix to enter your data like this

Trial	Resistance, R (Ohms)	Voltage, V (Volts)	Current, (Amperes)	Calculated Current $I = V/R$	% difference
1	3				
2	5				
3	10				
4	25				

1. Using the test board install the Amp meter in series with the circuit.
2. Insert a resistor in the clips at the top of the board
3. Enter the value of the resistor in column 2
4. Hold the VOLTmeter probes on either side of the test resistor. With the probes in place push the switch. Read the Voltmeter and enter the voltage in column 3.
5. Read the current on the AMPmeter and enter that value in column 4.
6. Repeat steps 2 through 5 for other resistor values

Results:

1. For each trial, calculate the expected current based on the resistance and measured voltage using Ohm's Law. Record your results in your data table, and be sure to show a sample calculation.

Conclusions:

1. When the resistance in the circuit went up, what happened to the current in the circuit?
2. Is there a difference between the calculated current and the measured current? What do you think is the reason for this difference?
3. Do you think that your circuit follows Ohm's Law? Why or why not?