

INVESTIGATION - OHM'S LAW

Aim: *Student to improve*

To graph the Voltage – Current graphs for a resistors

To investigate any relationship between voltage and current

Hypothesis:

Student design

Theory:

Student design

Apparatus:

0 – 12 V DC Power supply

Switch

Ammeter

Voltmeter

Resistor

Connector wires

Job Safety Analysis

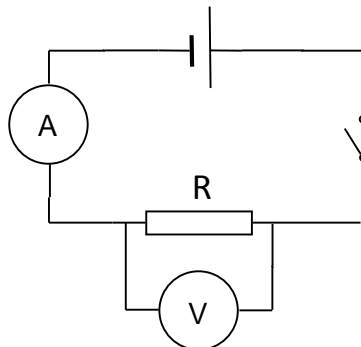
Student design

Risk Identification	Risk Management
Eg. Frayed wires	Eg. Check wires and discard if frayed

Method:

Students to improve and expand upon

1. Construct circuit.1 shown below
2. Set the power supply to 2 Volts DC and measure the voltage drop across R and the current through R.
3. Increase the voltage of the power supply by 2 Volts and repeat step.2
4. Repeat steps 2 & 3 until the power supply reaches a supply voltage of 12 Volts DC
5. Record results in table.1



Circuit.1 Simple series circuit

Results Table

Students to improve

Power supply Voltage (V)	V(R)	I(R)
0		
2		
4		
6		
8		
10		
12		

Graphing

Student's to generate V-I graph

1. Using Excel construct a straight line graph of Voltage – Current for results from circuit.1
Plot a line of best fit upon the graph. Be sure to label your graph fully.

Calculation

1. Calculate the gradient of your graph. Show your calculations using

$$\text{Gradient (m)} = \frac{\text{Rise}}{\text{Run}}$$

OR

Use Excel's "add equation" to the trend line to find the gradient.

Discussion

Students to answer in as much detail and correct terminology as possible

1. What quantity does the gradient of a $V - I$ graph give you?
2. Compare the gradient of the graph against the value of the resistor. Make a comment upon the comparison.
3. As the current increases on the graph, describe what happens to the voltage. Can you describe this relationship using scientific terms
4. State the law relating Voltage, Current and Resistance. State the relevant equation.
5. Analyse and evaluate the practical method. State difficulties encountered and suggested improvements.
6. Make a comparison between your findings and that predicted within your hypothesis and explain any noticeable differences.

Conclusion

Students to design a conclusion which satisfies the aim and purpose of the investigation.