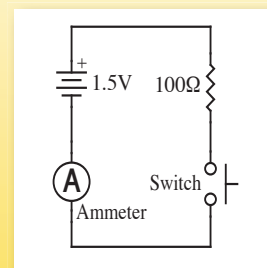
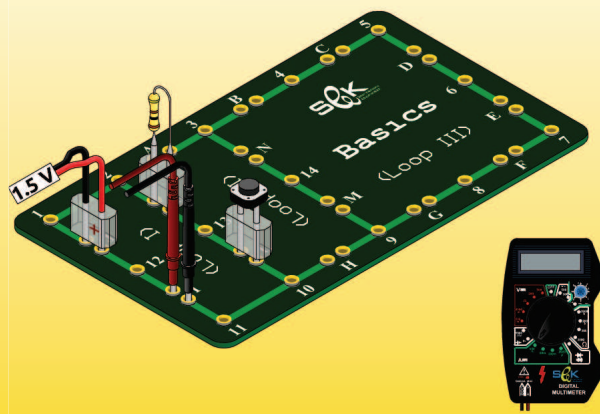


Experiment No. (14)

Measuring Current, Voltage & Calculating Power in a Circuit



Objectives:

1. The student will be able to measure Current and Voltage in a Simple Circuit.
2. The student will calculate the power dissipated by a resistor.

Apparatus:

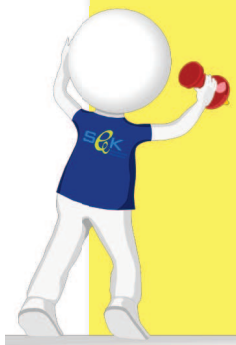
- | | | |
|------------------------------|--------------------|------------------------|
| • Basics Board | • Connection Wires | • Resistor 100Ω |
| • Voltage Source (PSB Board) | • Bulb 3.8V | • Switch |
| • DMM | • Bulb 6V | • Jumper |

Procedure and Conclusions:

1. Build a simple circuit by inserting a resistor 100Ω at the pair (K) and a switch at the pair (L).
2. Connect (1.5 volt) from PSB board to pair (J) using a connection wire.
3. Turn the selection dial of the DMM to DCA mode (range 200mA), insert the DMM probes at the point of the pair (I).
4. Press the switch button to close the circuit and see the Ammeter reading.
 - From the Ammeter reading, the current passes through the resistor 100Ω ismA.
5. Take the connection wire off the outlet socket 1.5V and insert it in outlet socket 3V on the PSB Board. Press the switch button and see the change in the Ammeter reading.

- By using a voltage 3 volt instead of 1.5 volt, the measured current passes through the resistor 100Ω becomesmA.
7. Take the DMM probes off the pair (I), turn the selection dial of the DMM to DCV mode (range 20 V), then insert the DMM probes at the points (2) & (13) to measure the potential difference across the resistor 100Ω .
 - 8. Insert a jumper at the pair (I), press the switch button and see the Voltmeter reading.
 - The potential difference you measured across the resistor 100Ω isvolt.
 - Calculate the power dissipated by the resistor 100Ω using the formula ($P = I^2 \times R = \dots\dots\dots$ Watt), where (P) is the power, (R) is the resistor and (I) is the current..
 10. Insert a bulb 3.8V at the pair (K) instead of the resistor 100Ω , press the switch button and watch the change in the Voltmeter reading.
 - Potential difference you measured across the bulb 3.8V isvolt.
 11. Insert a bulb 6V at the pair (K) instead of the bulb 3.8V, press the switch button and watch the change in the Voltmeter reading. Compare the brightness of the two bulbs.
 - Potential difference you measured across the bulb 6V isvolt.
 - The brightness of the bulb 6V is ... higher / lower ... than that of the bulb 3.8V.

Notes:



- To measure the **current** through a resistor, an **ammeter** should be connected in **series** with the resistor.
- A **voltmeter** should be connected in **parallel** with a resistor when measuring **voltage** across the resistor.
- To calculate the circuit power, we use the formula:
 $P = V \times I$ or, $P = I^2 \times R$ or, $P = V^2 / R$
 Where, (P) is the power measured in Watts, (V) is the Voltage measured in Volts, (I) is the Current measured in (Amperes), and (R) is the Resistance measured in Ohms