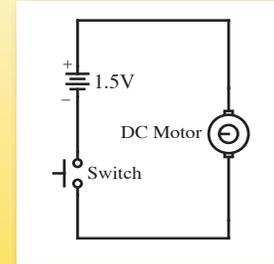
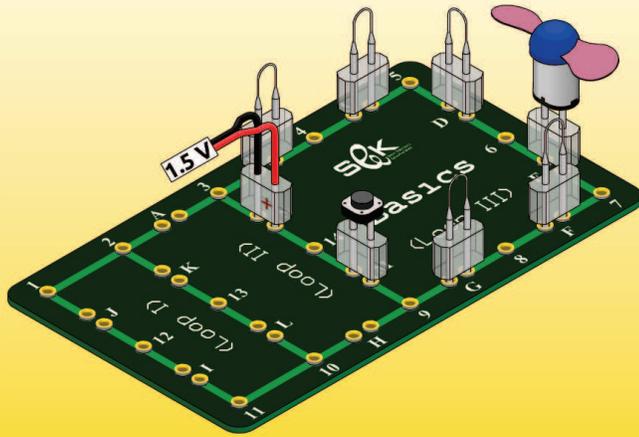


## Experiment No. (2) Simple Circuit 2 (Electric Motor –Dynamo)



### Objectives:

1. The student will investigate and understand energy transformation in the Electric Motor and Dynamo.
2. The student will investigate and understand the effect of inverting the voltage source polarities on the Electric Motor.
3. The student will produce electricity from the dynamo.

### Apparatus:

- Basics Board
- DMM
- Connection Wires
- Jumpers
- LED
- Voltage Source (PSB Board)
- Electric DC Motor
- Switch
- Fan

### Procedure & Conclusions:

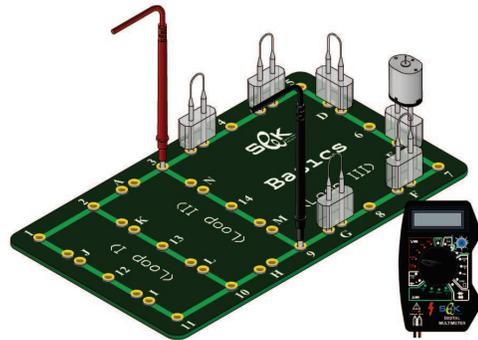
1. Use Loop III on the Basics board to build this circuit by inserting a switch at the pair (M), Electric Motor at the pair (E), jumpers at the pairs (B, C, D, F, G).
2. Connect (1.5 volt) from PSB board to the pair (N) using a connection wire.
3. Press the switch button and see what happens to the rotational speed and the direction of the rotation of the Motor.
  - When you press the switch button to close the circuit, the direction of the rotation is ... **clockwise / anticlockwise** ...
4. Connect (3 volt) to the pair (N) instead of (1.5 volt).
5. Press the switch button and watch the change in the rotational speed.
  - As the voltage applied to this closed electric circuit increases, the rotational speed of the Electric Motor ... **increases / decreases**...
6. Invert the polarity of the voltage source in the electric circuit through

reversing the connection wire at the pair (N) and watch the change in the direction of the rotation.

- Inverting the polarity of the voltage source in the above closed electric circuit ... **changes / doesn't change** ... the direction of the rotation.
- By inverting the polarity of the voltage source in the above closed electric circuit, the direction of the rotation becomes ... **clockwise / anticlockwise** ....
- This electric circuit is an example of transformation of ..... energy to .....energy.

## Dynamo:

7. Take the connection wire off the pair (N) and remove the switch at the pair (M).
8. Set the DMM to DCV mode (range 2000 mV), then insert its probes at the points (3) and (9).
9. Try to rotate the shaft of the motor by your fingers rapidly while watching the Voltmeter reading. OR, blow fast air out of your mouth on the fan mounted on the motor.



**Note:** The Voltmeter reading indicates that rotating the dynamo (motor) shaft produces electricity.

- This electric circuit is an example of transformation of ..... energy into ..... energy.
10. Remove the probes of the DMM. Insert a LED at the pair (N) and a jumper at the pair M, then try to rotate the shaft of the motor by your fingers rapidly while watching the LED lighting. OR, blow fast air out of your mouth on the fan mounted on the motor.

**Note:** If the LED doesn't emit light, you need either to reverse it at the pair (N) and rotate the shaft of the dynamo (motor) more stronger.

- As you rotate the shaft of the Electric Motor (Dynamo), the LED ... **emits / doesn't emit** ... light, this indicates that rotating the shaft of the dynamo produces .....



## Discussion

1. Discuss energy transformation in laundry machine, Electric Stove and Light bulb.