Induction with an Electromagnet

7. Rewire the galvanometer and connect it to the larger coil. Slip the smaller coil inside the larger coil. Connect the small coil in series with a switch, battery, and rheostat, so that the arrangement resembles that shown in **Figure 2.** Close the switch. Adjust the rheostat so that the galvanometer reading registers on the scale. Observe the galvanometer.
8. Open the switch to interrupt the current in the small coil. Observe the galvanometer.
9. Close the switch again, and open it after a few seconds. Observe the galvanometer.
10. Adjust the rheostat to increase the current in the small coil. Close the switch, and observe the galvanometer.
11. Decrease the current in the circuit, and observe the galvanometer. Open the switch.
12. Reverse the direction of the current by reversing the battery connections. Close the switch, and observe the galvanometer.
13. Place an iron rod inside the small coil. Open and close the switch while observing the galvanometer. Record all observations in your notebook.
14. Clean up your work area. Put equipment away safely so that it is ready to be used again.

Figure 1

Step 3: Connect the coil to the galvanometer. Holding the magnet still, move the coil over the magnet quickly.

Step 4: Holding the magnet still, move the coil over the magnet slowly.

Step 6: Repeat the procedure, but hold the coil still while moving the magnet.

ANALYSIS

1. **Describing Events** Based on your observations from the first part of the lab, did the speed of the motion have any effect on the galvanometer?
2. **Explaining Events** In the first part of the lab, did it make any difference whether the coil or the magnet moved? Explain why or why not.

CONCLUSIONS

3. **Drawing Conclusions** Explain what the galvanometer readings revealed to you about the magnet and the wire coil.
4. **Drawing Conclusions** Based on your observations, what conditions are required to induce a current in a circuit?
5. **Drawing Conclusions** Based on your observations, what factors influence the direction and magnitude of the induced current?

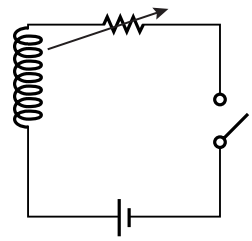

Figure 2

Step 7: Connect the larger coil to the galvanometer. Place the smaller coil inside the larger coil. Connect the smaller coil in series with the battery, switch, and rheostat.