

Second Magnetic Induction Activity

Attach the large solenoid to the battery, and the small (movable) coil to the galvanometer.

1. Explore the magnetic field around the solenoid with the Magnaprobe. Determine which end is the north pole, and which is the south pole of the solenoid.
2. Insert the small coil into the solenoid, keeping the axis of the small coil along the axis of the solenoid.
With this arrangement, what is the angle θ between the normal to the plane of the small coil, and the direction of the magnetic field? Answer: _____
3. Move the small coil back and forth inside the solenoid; observe the galvanometer reading during this process.
4. Now, bring the small coil outside near the ends of the solenoid and again move it back and forth.

Does the behavior of the galvanometer needle differ from that in #3? How?

Come up with an explanation for the behavior of the galvanometer needle in #3 and #4, and account for any differences.

5. Put the small coil back into the middle of the solenoid, and use the wire to tilt the coil back and forth while it is in the solenoid. Observe the galvanometer reading.

What do you observe in this case?

Write an explanation for your observations

6. Return to the arrangement of #2 (small coil in center of solenoid, axes aligned with each other). Disconnect the battery, and observe the behavior of the galvanometer needle.

What happens to the galvanometer needle when you disconnect the battery? Describe in detail.

7. Now reconnect the battery, and again observe the behavior of the galvanometer needle.

Describe what happens to the galvanometer needle in this case.

Give an explanation for your observations in #6 and #7, and account for any differences.