HOMESCHOOL — SCIENCE —

BUILDING A SIMPLE SPEAKER

WITH A MAGNET AND COIL

Name: _____

Date: _____

Experiment #: _____

In this experiment, you will build a simple speaker. When current flows through a coil of wire near a magnet, the coil moves. These tiny movements make sound!

MATERIALS

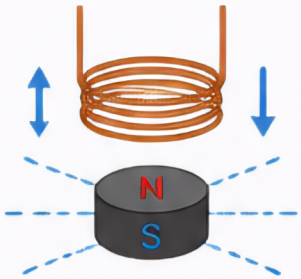
- 1 neodymium magnet (bisc or ring)
- 20–30 feet of enameled copper wire (30–32 gauge)
- Cardboard or plastic cup
- Tape
- Scissors or wire stripper
- 3.5 mm audio cable (or use an old headphone cable)
- Audio source (phone, tablet, or computer)

SAFETY

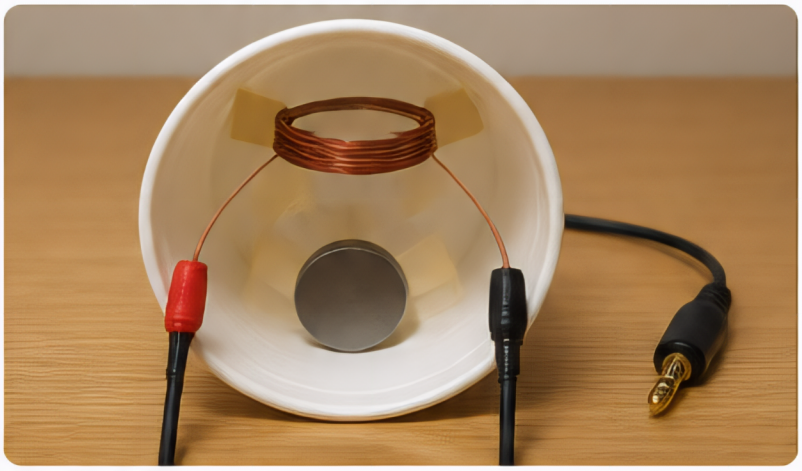
- Magnets can pinch fingers—handle with care.
- Keep magnets away from credit cards, electronics, and pacemakers.
- Ask an adult for help if needed.

HOW IT WORKS

When current flows through the coil, it becomes an electromagnet. The magnetic field interacts with the magnet in the cup. The coil is pushed and pulled very quickly. These vibrations make the air vibrate, and we hear sound!



WHAT YOU'RE BUILDING



PROCEDURE

1. **Make the Coil:** Wind the enameled wire into a coil with 20–40 turns. Leave about 2–3 inches of wire on each end of the coil.
2. **Prepare the Cup:** Tape the magnet to the bottom inside of the cup, centered.
3. **Attach the Coil:** Tape the coil inside the cup so it is suspended above the magnet. The coil should not touch the magnet. The coil should be free to move.
4. **Connect Wires:** Scrape or carefully sand the ends of the coil wires to remove the enamel. Twist each end to an audio cable wire (tip and sleeve). Use tape to secure the connections.
5. **Test It:** Plug the audio cable into your device. Play music or a sound. You should see the coil move and hear sound!

OBSERVATIONS & QUESTIONS

1. What happened when you played sound through your speaker?

2. What do you think would happen if you added more turns to the coil?

3. What could you try to make your speaker louder?

THINK FURTHER: Speakers use the same idea as your experiment, but with stronger magnets and more precise parts. Research how real speakers are built!