HOMESCHOOL SCIENCE EXPERIMENT

BUILDING A SIMPLE GENERATOR

WITH COILS AND MAGNETS

Name: _____

Date: _____

Experiment #: _____

OBJECTIVE

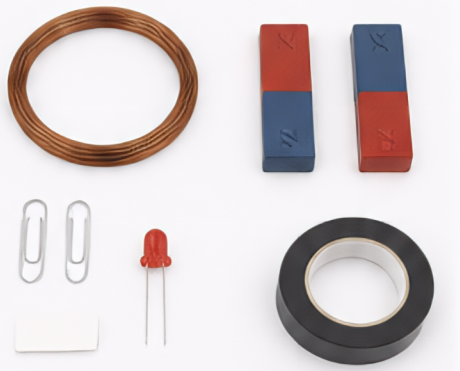
To build a simple generator that produces electricity when a coil of wire is rotated near magnets.

SAFETY

- Magnets can pinch skin—keep fingers clear.
- Do not connect the coil directly to a battery.
- Handle small parts carefully.
- Ask an adult for help if needed.

MATERIALS

- Enamel-coated copper wire (28–32 gauge)
- Strong magnets (2)
- Cardboard (or thick paper)
- Paper clips (2)
- LED (light-emitting diode) or small bulb
- Electrical tape
- Scissors
- Sandpaper or nail file (optional)

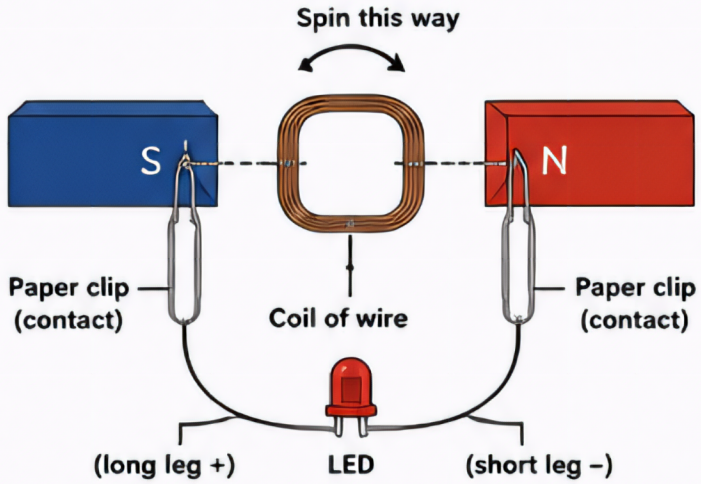


PROCEDURE

1. Make the Coil: Wrap the copper wire around a cardboard rectangle (about the size of a credit card) 50–100 times. Leave about 4–6 inches of wire on each end.
2. Remove the coil from the cardboard.
3. Scrape the enamel off the last 1/2 inch of each wire end using sandpaper or a nail file.
4. Bend the ends into small loops and attach one paper clip to each end. These will be your electrical contacts.
5. Set up the Magnets: Place the two magnets facing each other with a small gap between them (about 1–2 cm). Secure them so they do not move.
6. Make the Rotor: Hold the coil by the paper clips and place it between the magnets so the coil can spin freely.
7. Connect the LED: Touch the LED leads to the paper clips (LED long leg to one clip, short leg to the other).
8. Spin the Coil: Give the coil a quick spin between the magnets. Watch the LED!

TIP: The faster the coil spins, the brighter the LED generally appears.

SETUP DIAGRAM



HOW IT WORKS

When the coil spins between the magnets, the magnetic field through the coil changes. This change induces an electric current in the coil (electromagnetic induction), which lights the LED. This is the same principle used in many generators!

OBSERVATIONS & RESULTS

What happened when you spun the coil?

_____

_____

How did the speed of the spin affect the LED?

_____

Draw or describe any other observations.

_____

_____

_____

EXTENSION IDEAS

- Try using more turns of wire. Does it change the LED brightness?
- Try different spin speeds and record your results.
- Use a multimeter to measure the voltage produced.

What did you learn?

_____

_____

_____