HANDS-ON SCIENCE

BUILDING A SIMPLE MOTOR

WITH A BATTERY, MAGNET, AND WIRE

Name: _____ Date: _____

GOAL: Build a simple motor that spins using electricity, a magnet, and a wire coil.

MATERIALS

- 1 AA battery
- 1 strong magnet (disc or ring)
- 1 piece of copper wire (24–30 gauge, about 18–24 inches long)
- 2 paperclips
- Tape
- Sandpaper or metal file (optional)
- Pliers (optional)

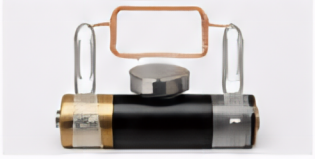
PROCEDURE

1 Make the Coil
Shape the copper wire into a rectangle coil, about 1–1.5 inches wide. Leave 1–2 inches of straight wire on each end.

2 Make the Commutator
Use sandpaper or a file to gently scrape the enamel (insulation) off the last 1/2 inch of each end of the coil.

3 Set Up the Supports
Unfold two paperclips so they stand upright. Tape them to the battery ends so the stripped ends of the coil can rest on them.

4 Add the Magnet
Place the magnet on the table between the paperclip supports, under the coil.

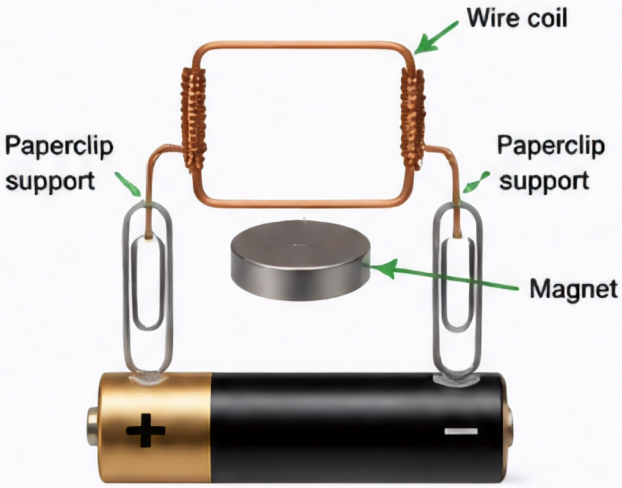


5 Start the Motor
Place the stripped ends of the coil on the paperclip supports. Gently flick the coil to get it spinning!

TIP: Make sure the magnet's field is strong and the coil spins freely between the supports.

HOW IT WORKS

When electricity flows through the wire coil, it creates an electromagnetic field. This field interacts with the magnet's field, creating a force that makes the coil spin. The commutator (the split ends of the coil) reverses the current each half turn, keeping the spin going.



SAFETY TIPS

- Use caution when handling tools like pliers or files.
- Keep strong magnets away from pacemakers, electronics, and magnetic storage devices.
- Wash your hands after the experiment.

OBSERVATIONS

What happened when you flicked the coil? _____

_____

Which direction does the coil spin? _____

What could you change to make it spin longer or faster? _____

_____

CONCLUSION

Explain in your own words how your simple motor works.

_____

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_____