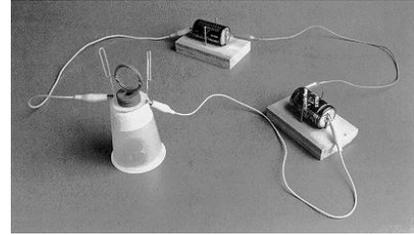


Magnetism – Motor

Let's build a motor!

Materials:

- 5 2.5 cm diameter disk ceramic magnets
- Masking tape
- Solid insulated 20 gauge copper wire
- D cell flashlight battery
- 2 large paper clips
- Wire stripper/cutter
- 2 lead wires (20cm)
- Black permanent marker
- Plastic cup



Procedure: (Remember to have your parent's permission and have them watch and help you.)

- Wind the copper wire into 5 circular coils about 2.5 cm (1") in diameter.
- Wrap the ends of the wire around the coil twice on opposite sides to hold the coil together. Leave 5 cm (2") projecting from each side of the coil.
- Strip the insulation off the ends of the wire projecting from the coil.
- Holding the coil vertically, colour the top of the projecting wire on one side of the projecting ends with the marker.
- Turn the cup upside down. Place two magnets on the top and 3 inside to hold them in place.
- Unfold one end of each paper clip and tape them to opposite sides of the cup, with their loop ends standing above the magnets.
- Place the ends of the coil in the paper clip loops.
- Adjust the height of the paper clips so the coil just barely clears the magnets.
- Adjust the coil and the clips until the coil stays balanced and centered while spinning.
- Trim off any excess wire.
- Remove the insulation from the ends of the electric leads.
- Tape one end of each electric lead to each end of the battery.
- Connect the other end of the leads to each paper clip.
- Give the coil a spin to start it turning.
- Adjust as necessary. Have patience! It will work.

What's Happening:

A current flow through the wire coil and creates an electromagnet. The permanent magnet attracts its opposite pole on the coil and repels the like pole, causing the coil to spin. Painting half of one end black prevents current from flowing for half of each spin. The inertia of the rotating coil carries it through until the coil connects again with the exposed wire. Then the electric current starts to flow again and the force continues in the same direction as it was before.

Extension:

Try adding more battery power by taping batteries together series, that is the +ve end of one touching -ve end of the other. This should make your motor spin faster.

This activity is based on our Magnetism kit. The source for this lab was: http://www.exploratorium.edu/snacks/stripped_down_motor/index.html. Our teaching kits (described on our website) are loaned out FREE to provide classroom teachers and parents of home schooled children an opportunity to explore Science in interesting ways. Please consider volunteering as a classroom guest speaker or allow your business as a field trip location.

Lorne Cooper, Regional Executive Director

PRAXIS, "Making Science Fun". Contact Praxis at praxis@praxismh.ca, www.praxismh.ca, Tweet or follow us @PraxisMedHat, or friend us on Facebook. Address: c/o 200 7th Street S.W., Medicine Hat, AB, T1A 4K1 Phone: 403-527-5365, Fax: 403-527-6570.