

Get Your Motor Running

An Energy Transformation Activity

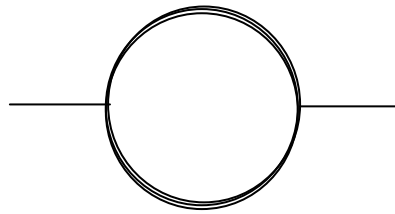
Written by Robin Reinarts and Kelly VanDusen

Students will create their own **DC** motor and observe multiple energy transformations.

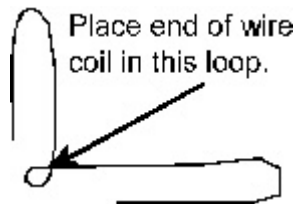
Materials: C cell battery, 2 large paperclips, ceramic magnet (available at Radio Shack), fine sandpaper, 24 gauge enamel-coated wire, wire cutters or scissors, rubber band or tape (optional)

Procedure:

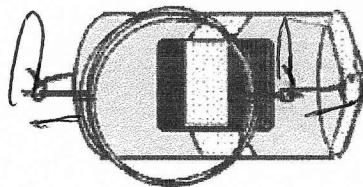
1. Cut 55 cm of wire and wrap it around the battery five times (be sure to leave wire sticking out on both ends).
2. Trim the ends of the wire so that they are about 3 cm long and stick out from **opposite sides** of the coil.
3. Remove coil from battery, then wrap the ends around the coil two or three times to help hold the coil's shape. It is VERY important that the ends are directly opposite each other.



4. Using sandpaper, remove the enamel coating from the ends of the wire, from coil to tips. The wire should be shiny where the enamel is gone.
5. Bend the paperclips into an L shape (be sure to bend it the direction that forms a loop in the clip) and place the longer end of the paper clips on the ends of the battery, sticking up into the air as high as you can get them. You can use a rubber band or tape to hold the paperclips, or just squeeze them with your fingers.



6. Place the magnet on the battery, and put the ends of the coil through the ring formed by the bent paperclips. Be sure that the coil is level on both sides and can spin without hitting the magnet.



Questions:

1. Flick the coil with your finger, what happens?
2. What energy transformations do you see and feel? Write the types and forms of energy beginning with the battery and ending with the coil.
3. Will the coil spin in either direction, or just one?
4. How could you make the coil spin faster?

Extensions:

In addition to demonstrating energy transformations, this activity can be used to show an electrical circuit, to talk about DC versus AC circuits or to demonstrate heating due to resistance of a wire.