Electric Motor Lab

Questions:

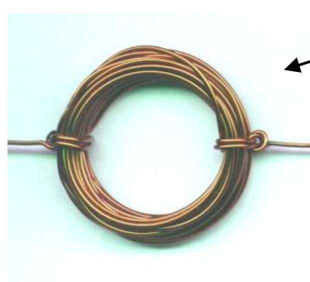
1) What causes a coil of wire to rotate in an electric motor?
2) What do electric motors convert or transform?

Hypotheses:

Materials: Magnet wire, sand paper, magnets, paper clips and a rubber band, and something round to wrap the wire around (a dry erase marker, film canister, etc).

Procedure:

1) Start about 3 inches from the end of the wire; wrap it around a round object like a dry erase marker. Be sure to make approx. 5 loops.
2) Leave a 3 inch tail opposite the original starting point and wrap the two tails around the coil so that the coil is held together and the two tails extend perpendicular to the coil as shown.



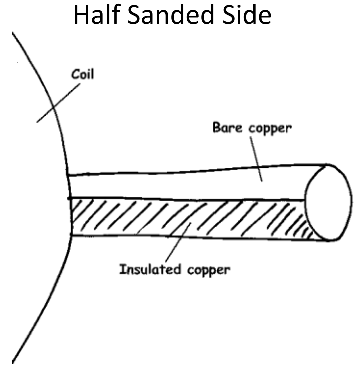
5 Loops

Tail is wrapped around the coil to hold the coil together and to hold the tail in position.

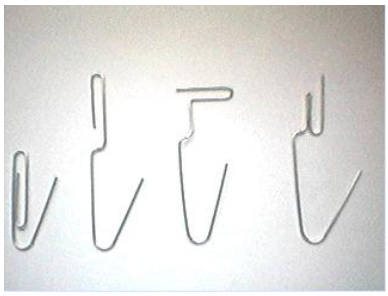
NOTE: Be sure to center the two tails on either side of the coil. Balance is important.

3) Using sandpaper, very carefully, **completely** strip the glossy insulation from 1 side of the free ends. ******_**For the other end, only strip the top half of the wire. Having your coil perfectly balanced and straight COUNTS!!! (See Image Below)**_

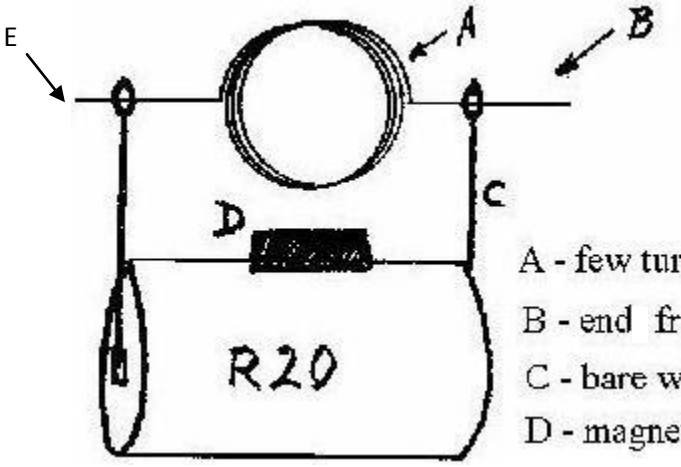
Half Sanded Side



4) Unfold one end of the paper clip, bend to create a holder and attach one to either side of the battery. Hold them in place with rubber bands or tape. The tighter they are the better. (Options for bending your paper clip is shown below, or you can come up with your own design.)



5) Place magnet(s) on the side of the battery.
6) Place coil in paper clips so that it is free to rotate above the magnets. See diagram below:



A - few turns of insulated wire
B - end free of insulation (bare)
C - bare wire (Paper Clips)
D - magnet
E- end half sanded

7) **COMMON ISSUESS:** You may have to give it a gentle push to get it started, but it should begin to spin rapidly. If it doesn't spin, check to make sure that all of the insulation has been removed from the wire ends, and one side is half sanded. If it spins erratically, make sure that the tails on the coil are centered on the sides of the coil.

Post Lab Questions

1) Motors are devices that convert _____ energy into _____ energy.

2) How could you modify your motor to make it spin faster?

3) What does the coil of wire become when you put an electric current through it?

4) Why do you think you need to keep one side of the wire un-sanded?

5) Can you make the coil spin in the opposite direction? How?

6) Give three examples of electrical motors you have seen at work at home?

Conclusion: Use the following word bank to create a conclusion paragraph for your lab. Include how you were able to build the motor and what took place to make it work.

Converts, kinetic, electric current, magnet, magnetic field, electromagnet, magnetic force, attraction, repulsion, poles, opposite, spinning, electromagnetic interaction.