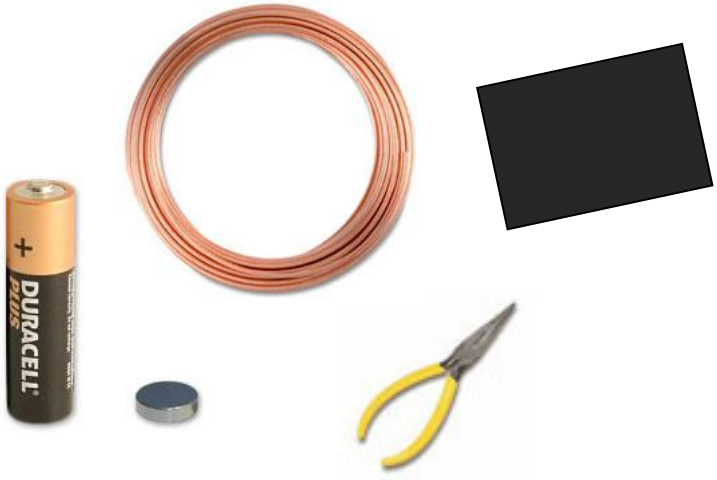
Homopolar Motors

A simple project that show you how electricity and magnetism work together to make motors. The end result? A cool-looking gadget that spins and confounds!



Materials

Provided:

- 2 AA Batteries
- 1 Neodymium Magnet (.5" diameter)
- 2 ft 21-gauge Bare Copper Wire
- Sandpaper

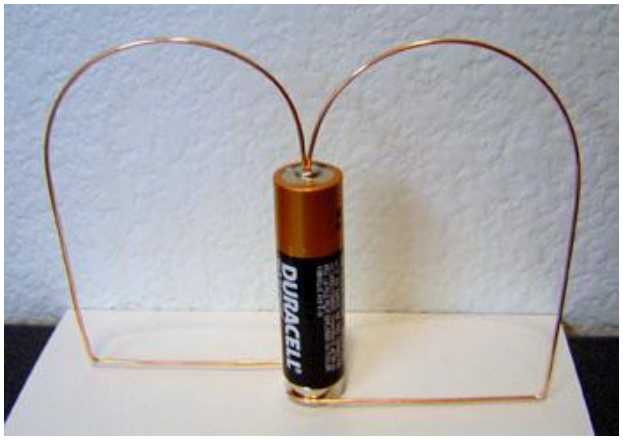
Optional:

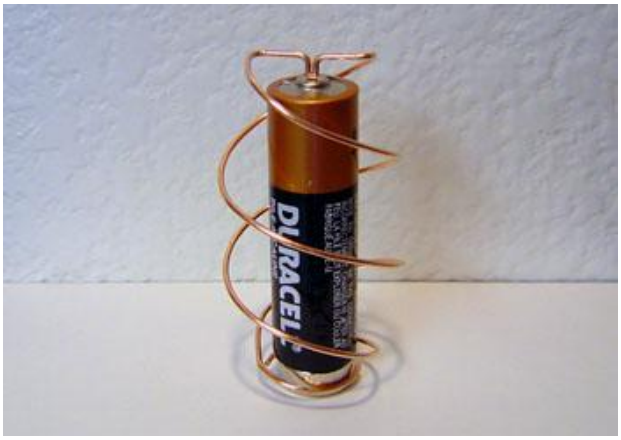
- Pliers – to bend wire
- Small Piece of non-conducting material

Steps:

1. Place the magnet on a table or other flat surface.
2. Place the negative end of one battery on top of the magnet.
3. Bend wire into any shape you want (See sample pictures below). Requirements:
    - Middle of the wire must touch the positive terminal of battery – bend wire to form a node in the middle
    - Wire must be balanced on either side of positive terminal
    - Two ends of wire must both touch the sides of the magnet but not each other
4. When you're satisfied with the shape, take it off the battery.
5. Then, sand off the insulation from the points of contact (where it touches the battery terminal and the magnet)
6. Now, replace the wire onto the battery and magnet set-up.
7. The device should start spinning! Note: It may require some tweaking and fixing to start.

Examples:





Tips and Warnings:

- Be Careful! The copper wire will become HOT!!
- Bending the wire takes time and several trials – be patient!
- The battery will only last a few minutes! To help,
    - You can tweak your design as much as possible before you sand off insulation
    - You can place a small piece of paper, electric tape or other non-conducting materials between the positive end of the battery and the wire so that power isn't wasted while you tweak your wire.
- You can dent the top of the positive end of the battery to provide a pocket where the wire can comfortably sit. This way, it doesn't slip off.
- If your wire is touching the table, you can raise the level of the motor by placing a few pennies under the magnet.

For Sample Videos and More Information: http://www.instructables.com/id/Magnetic-Field/