



## Build Your Own Speaker

### What is a Speaker?

A speaker is a device found in radios, telephones, and other electronic devices that converts electrical energy into sound energy. Most speakers utilize two magnets: an electromagnet and a permanent magnet. The electrical signals from the radio drive the electromagnet to create a fluctuating magnetic field. This magnetic field pushes and pulls on the permanent magnet causing vibrations that create sound waves.

With the help of a parent or teacher, you can make your own speaker with these simple supplies:

- 4 - 6 yards of magnet wire (available at hobby shops or Radio Shack)
- an empty film canister
- one round magnet (a neodymium magnet works best)
- masking tape
- small piece of sandpaper
- scissors
- low power portable radio



### Create It

1. Carefully wind the magnet wire around the base of the canister.
2. Tape the coil of wire in place.
3. Using sandpaper, remove one inch of enamel insulation from both ends of the wire to expose copper metal.
4. Tape or glue the permanent magnet into the bottom of the canister.

5. Attach the two leads to the speaker connectors of a suitable, low power radio. The speaker connectors are usually located on the back of the radio.
6. Tune the radio to your favorite station and set the volume to mid-range.



### Try It

Turn your radio on. Listen closely, you should hear sound coming from your speaker.

Examine your speaker and answer the questions below.

Describe the sound coming from your speaker?

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Make a list of electronic devices that have speakers. How many can list?

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What words would you use to describe your speaker?

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### **Tweak It**

How can you improve your speaker? Try modifying your design, or build a new speaker. Keep testing until you have the clearest, loudest speaker you can build!



### **Explore It**

If you have a broken radio or other device that uses a speaker, remove the speaker and see if you can find the electromagnet (coil) and the permanent magnet.