

BUILDING A SIMPLE RADIO RECEIVER

Explore how radios pick up signals through the air.

Name: _____

Date: _____

Age/Grade: _____

EXPERIMENT OVERVIEW

You will build a simple radio receiver that can detect AM broadcast signals from local radio stations without needing any batteries.

HOW IT WORKS

The antenna picks up radio waves from the air. The coil and capacitor tune to a specific station. The diode detects the signal, and the earphone converts it to sound.

MATERIALS

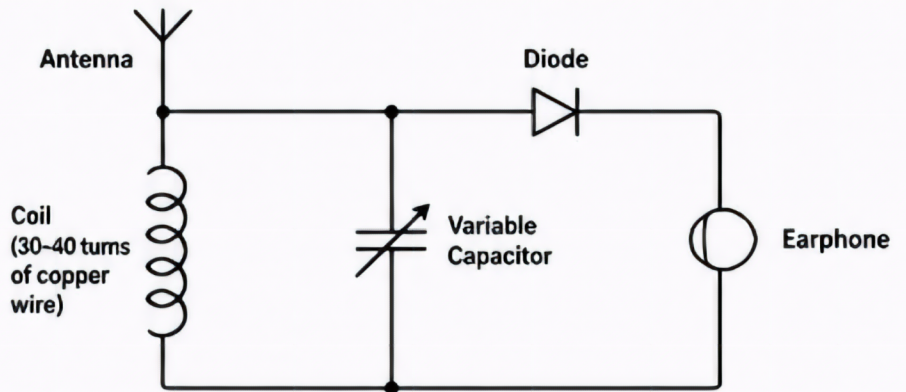
- 30–40 cm (12–16 in) of insulated copper wire
- 1 variable capacitor (10–365 pF) (from a simple radio kit or online)
- 1 germanium diode (e.g., 1N34A)
- 1 earphone (high impedance preferred)
- 1 long antenna wire (5–10 meters / 16–33 feet)
- Alligator clip leads
- Tape



SAFETY NOTE

This experiment uses no batteries or mains power. Do not connect this circuit to any powered electrical sources.

CIRCUIT DIAGRAM



Tip: The coil and capacitor form a “tuned circuit” that selects one radio station at a time.

BUILDING INSTRUCTIONS

- 1. Make the Coil:** Wrap the copper wire around a pen or marker 30–40 times. Leave a few centimeters of wire on each end and remove the coil.
- 2. Connect the Circuit:** Use the diagram above to connect the coil, variable capacitor, diode, and earphone.
- 3. Attach the Antenna:** Connect the long antenna wire to the free end of the coil.
- 4. Test Your Radio:**
 - Put the earphone in your ear.
 - Slowly turn the variable capacitor knob.
 - Listen for stations. You may hear music, talk, or static.
- 5. Improve Reception:** Try moving the antenna, changing its length, or moving to a different location.

THINGS TO OBSERVE

- What stations can you hear?
- How does turning the capacitor affect what you hear?
- Does the length or position of the antenna change the sound?
- What happens if you move to another room or outside?

CHALLENGE IDEAS

- Build a better coil with more or fewer turns. How does it change the stations you can hear?
- Try using a different diode (if available).
- Add a ground wire (long wire connected to a metal object or outside ground) and see if it improves reception.
- Can you receive more stations at night or in the morning?



REFLECTION

1. What did you learn about how radios work? _____
2. What challenges did you face during this experiment? How did you solve them? _____
3. What would you like to try next time? _____