



# BUILDING A FARADAY CAGE AND TESTING IT WITH A CELL PHONE



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Location: \_\_\_\_\_

## OVERVIEW

A Faraday cage is a conductive enclosure that blocks electromagnetic signals. In this experiment, you will build your own Faraday cage and test it by seeing whether a cell phone can send or receive signals inside the cage.



## MATERIALS

- Cardboard box (with a separate lid)
- Aluminum foil
- Scissors
- Tape
- Cell phone
- Another phone (to call or text)
- (Optional) Wi-Fi enabled device
- (Optional) Multimeter (for extra testing)



## TEST PROCEDURE

1. Put your cell phone in the Faraday cage and close the lid.
2. Using another phone, try the following while the phone is inside the cage:
  - Call the phone
  - Send a text message
  - Try connecting via Wi-Fi (if applicable)
3. Observe what happens.
4. Remove the phone from the cage and try the same tests again for comparison.

## OBSERVATIONS & RESULTS

| Test             | Inside the Cage<br>(What happened?) | Outside the Cage<br>(What happened?) | Did the Cage Block the Signal?<br>(Yes / No) |
|------------------|-------------------------------------|--------------------------------------|----------------------------------------------|
| Phone Call       |                                     |                                      |                                              |
| Text Message     |                                     |                                      |                                              |
| Wi-Fi Connection |                                     |                                      |                                              |

## REFLECTION

1. What happened to the phone when it was inside the Faraday cage? \_\_\_\_\_
2. What does this tell you about how a Faraday cage works? \_\_\_\_\_
3. Where might Faraday cages be used in real life? \_\_\_\_\_

## WHAT IS A FARADAY CAGE?



When electromagnetic waves (like cell signals, Wi-Fi, and Bluetooth) hit a conductor, the charges in the material move and cancel out the electric field inside the enclosure. This blocks the signals from getting in or out.



## BUILD YOUR FARADAY CAGE

1. Line the inside of the box with aluminum foil. Cover all sides, the bottom, and the lid completely.
2. Make sure the foil pieces overlap so there are no gaps.
3. Tape the foil in place. The foil should touch itself or overlap on all seams.
4. Line the inside of the lid with foil as well.
5. Close the lid. Your Faraday cage is ready!

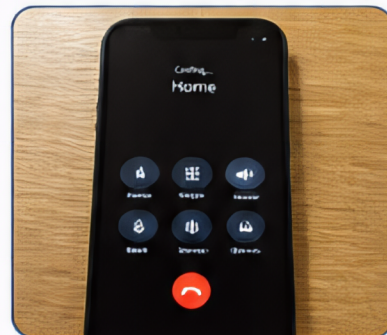


**TIP:** A Faraday cage must be fully enclosed in conductive material to work properly.

INSIDE THE CAGE (PHONE INSIDE)



OUTSIDE THE CAGE (PHONE OUT)



**SCIENCE IN ACTION:** Faraday cages are used to block unwanted signals and protect sensitive equipment. They are also used to prevent signals from getting out, like in some secure rooms.