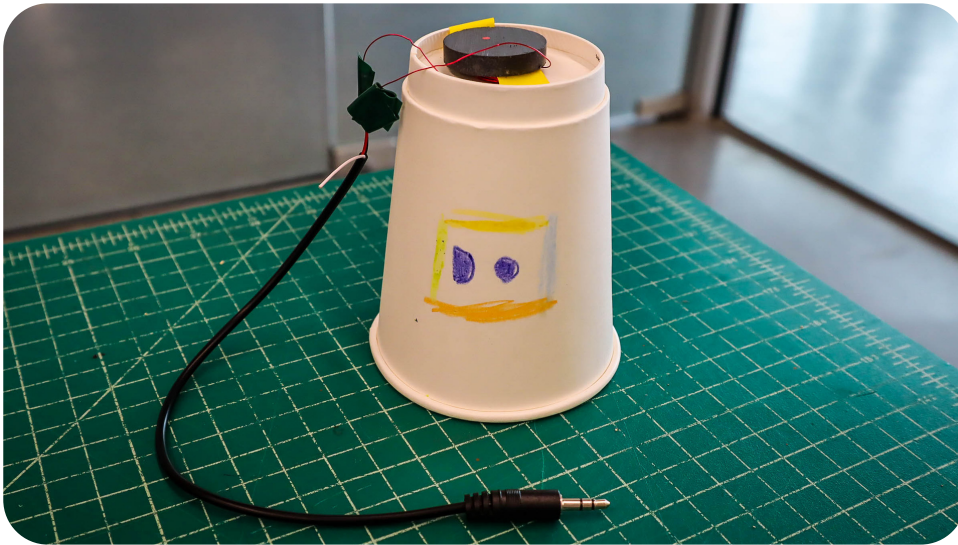


# Do Space Summer 2021

## TAKE & MAKE: DIY SPEAKER



### INTRODUCTION

Have you always wondered how sound work? You may understand that you can turn on a TV and your show makes sounds, but how does the TV turn electricity into music? In this TAKE & MAKE, learn how to make a speaker out of household supplies and discover how energy produces sound.

### WHAT YOU'LL NEED:

Here's what you'll find in the kit:

- Magnet
- Copper Wire
- Electric Tape
- Aux Cable
- Paper Cup

You'll also need:

- Audio Source
- Tape
- Marker or Tube

### Subjects:

- Energy
- Waves
- Sound
- Engineering

### Standards:

- PS3.B
- PS3.D
- ETS1.C

[nextgenscience.org](http://nextgenscience.org)

### Maker Capacities:

- Tinker to Explore
- Finding Opportunities

[agencybydesign.org](http://agencybydesign.org)

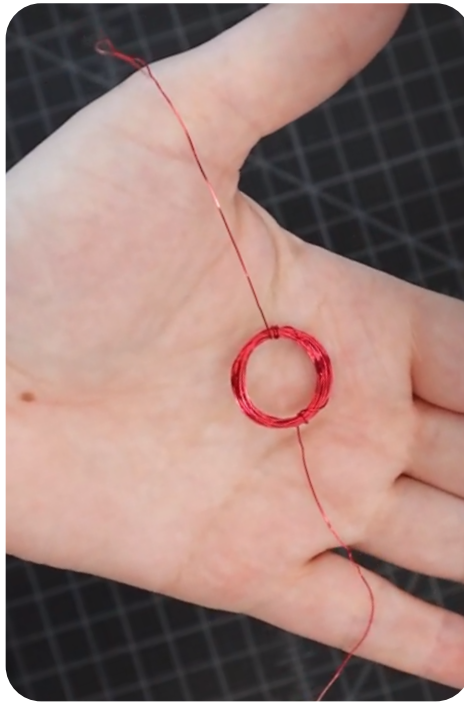
### Key Terms

- Circuit
- Sound waves
- Vibrations

# Let's Make This!

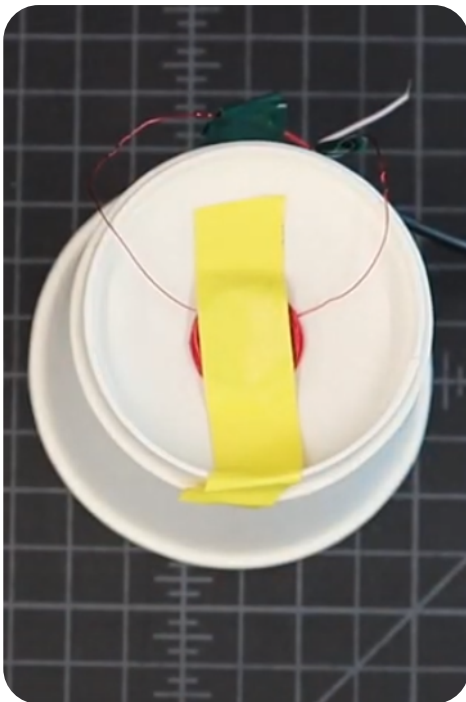
## Preparation

1. Make a coil of wire by wrapping the magnet wire around a marker or tube. Leave at least 3 inches of wire loose at both ends of the coil.
2. Take both ends of the coil and wrap them once around the inside of the coil.
3. Twist one end of the exposed (not red part) part of the coil end to the black-cased wire on the AUX cable. Do the same with the other end of the coil to the red-cased AUX cable.
4. Wrap electric tape around the twisted wires.



## Why does it work?

Speakers are usually built by using a paper cone, a coil of copper wire, and a magnet. The coil of copper wire moves back and forth when an electrical signal is passed through it. The coil of copper wire and the magnet cause the rigid paper cone to vibrate and reproduce sounds.



## Assemble

1. Tape the coil to the bottom of the paper cup.
2. Plug the AUX cable into an audio source with an AUX port.
3. Hold the cup up to your ear with one hand.
4. Hold the magnet directly next to the coil at the outside bottom of the cup so it is almost touching. Can you hear the song playing?
5. Try slowly moving the magnet closer to or farther away from the coil. How does the loudness of the music change?

## Troubleshooting

Troubleshooting: If you do not hear anything, double check to make sure your wires are tightly twisted together and not loose. Make sure the volume on your electronic device is turned up all the way.



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