Curiosity Guide #407
Sense of Hearing

Accompanies Curious Crew, Season 4, Episode 7 (#407)

Tympanic Membrane

Investigation #6

Description

Make a model of your ear drum and test out rates of vibration!

Materials

- Bowl or empty box
- Computer with tonal frequency .wav files, https://www.sciencebuddies.org/science-fair-projects/project-ideas/HumBio_p011/human-biology-health/measuring-hearing-threshold-different-pitches#procedure
- Portable or Bluetooth speaker
- Plastic wrap or wax paper
- Rubber band large enough to fit around the bowl or box
- About 30 grains of uncooked rice
- Cookie sheet

Procedure

1. Place the speaker inside the bowl or box.
2. Cover with a sheet of plastic wrap stretched tight.
3. Secure in place with a large rubber band.
4. Sprinkle the rice on the plastic wrap.
5. Near the bowl, clap loudly, or try slapping a cookie sheet.
6. What do you notice?
7. Locate some online .wav files with different frequencies that test 40-400 hertz.

8. Play the sounds one at a time through the speaker.
9. What happens with each tone?

My Results

Explanation

The stretched plastic wrap represents the ear drum, or tympanic membrane. Sounds cause the plastic wrap to vibrate and make the rice jump. Sounds of different frequencies played through the speaker in the bowl cause different rates of vibration, which is visible with the various movement of the rice. The lower frequencies, which have larger waves, cause the rice to move more than the higher frequencies.

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