Curiosity Guide #805
Speed of Sound

Accompanies Curious Crew, Season 8, Episode 5 (#805)

Air Drums

Investigation #3

Description

Can you "see" a sound? Let's try!

Materials

- 2 similar shallow-framed drums
- Mallet or striking hammer
- Storage tray
- Ring stand
- String
- Styrofoam ball
- Measuring tape
- Tape
- Scissors

Procedure

1) Place the two drums on the table so that the drums each stand on edge with their open sides facing each other and the membranes apart.
2) Measure and leave about three inches between the open edges of the frame of the drums. Tape the drums to the table.
3) Set up the ring stand to the side of one of the drums.
4) Cut a string 1 meter long, tie one end to the ring stand, and suspend the Styrofoam ball from the string so that the ball hangs directly beside the membrane of one of the drums and barely touches it.

5) Hold the top of the opposite drum with one hand and strike the membrane with the mallet in your other hand.
6) What do you notice?
7) Try exchanging the drum you struck with a storage tray. Stand the tray on end and strike the bottom. What happens this time?

My Results

Explanation
When either the drum membrane or bottom of the tray is struck, the Styrofoam ball beside the second drum swings away. The struck drum membrane oscillates or wiggles. That energy disturbance impacts the air particles beside the membrane, and the air particles oscillate, too, as though they were attached to springs between surrounding particles. The pressure wave causes the particles to move together and then away from each other. The particles move between compressions, or being close together, and rarefactions, being furthest apart. The energy transfers from particle to particle until the energy hits the particles of the receiving drum membrane, which vibrates and hits the Styrofoam ball that visually moves. The ball's movement serves as evidence that the waves moved or transmitted through the air particles. This is also like the eardrum's oscillations from pressure waves in the environment.

Parents and Educators: use #CuriousCrew #CuriosityGuide to share what your Curious Crew learned!

Curious Crew is a production of Michigan State University.
Learn more at WKAR.org.