

# GOOD VIBRATIONS

Perhaps the most important function of hearing is that it makes human speech possible. Explore the ways in which your ears enable you to hear sounds.

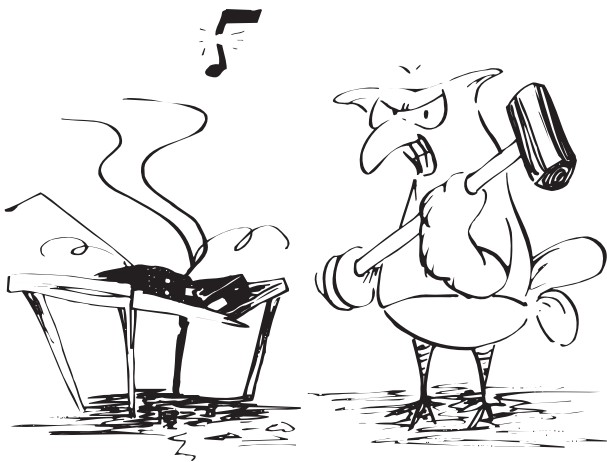
**MATERIALS:** Piece of waxed paper; a hard plastic comb; small radio.

## DOING IT:

**1. Feel the Vibrations:** Fold a piece of waxed paper in half. Slip a comb into the waxed paper so that the teeth are against the fold. Put the comb into your mouth so that your lips rest gently on the folded edge of the waxed paper. Blow and hum. Can you feel the vibrations produced by this homemade kazoo?

**2. Listen:** Tap around your ears with one finger. Relax. Breathe deeply. Close your eyes. Listen. What do you hear? Don't identify where the sounds are coming from (e.g. dog barking, train whistling); just experience the sounds. Count all the different sounds you can hear -- rustling, whistling, swishing, shuffling, hissing, thumping, buzzing, etc. Which are natural sounds and which are human-made? Imitate the sounds, exactly as you hear them.

**3. Moving Music:** Close your eyes as a partner moves a radio to different spots in a room. How accurately can you point to the location of the sound? Do you improve with practice? How easy is it to locate the sound if the radio is directly in front or behind you?



When you put your ear to a large seashell, you hear a dull roaring sound. That's the echo of the blood moving in your ear.



The sounds you hear are vibrations of the air around you; the louder the noise, the more the air vibrates. The human ear is so sensitive to vibrations that it is possible for a person to sit in a quiet room and detect the ticking of a watch 6 m away. The outer part of your ear (the part that sticks out the side of your head) channels vibrations down to a thin membrane that's stretched so tightly it's called the "ear drum". The ear drum then vibrates and the vibrations are amplified by three tiny bones (the hammer, the anvil, and the stirrup) as they go into the inner ear, deep inside your head. The inner ear consists of a 34 mm long, coiled tube called the "cochlea". The cochlea is filled with fluid and divided down its length by a flexible membrane. Along the length of the membrane are thousands of tiny receptor cells, called "hair cells" because stiff hairs stick up from their top surface. The hair cells are very sensitive to the vibrations of the membrane. The hair cells translate the vibrations into nerve impulses which your brain registers as sound.

Just as you need two eyes to work out where objects are in relation to each other, you need two ears to locate sounds. If, for example, a sound is on your left, the vibrations of the air reach your left ear just before your right ear and are less intense at the right ear because your head is in the way. Your brain is able to detect the slight differences in what each ear "hears". When a sound is directly in front or behind you, the sound reaches both ears at the same time and you can have difficulty locating the sound. Blind people can become quite good at locating sounds, and can often make a sound and listen to it echo back from objects to locate the objects.

**Topics:** Senses; Sound; Brain.

