Do Your Ears Hang Low? The Science of the Human Ear

Your ears are in charge of collecting sounds, processing them, and sending sound signals to your brain. And that's not all — your ears also help you with your balance. The ear is made up of three different sections: the outer ear, the middle ear, and the inner ear. These parts all work together so you can hear and process sounds.

The Outer Ear:
The outer ear is called the pinna or auricle (say: or-ih-kul). The main job of the outer ear is to collect sounds, whether they're your friend's whispers or a barking dog. The outer ear also includes the ear canal, where wax is produced.

The Middle Ear:
After sound waves enter the outer ear, they travel through the ear canal and make their way to the middle ear. The middle ear's main job is to take those sound waves and turn them into vibrations that are delivered to the inner ear. To do this, it needs the eardrum, which is a thin piece of skin stretched tight like a drum. The eardrum separates the outer ear from the middle ear and the ossicles (say: ah-sih-kulz). What are ossicles? They are the three tiniest, most delicate bones in your body. They include:

- the malleus (say: mah-lee-us), which is attached to the eardrum and means "hammer" in Latin
- the incus (say: in-kus), which is attached to the malleus and means "anvil" in Latin
- the stapes (say: stay-peez), the smallest bone in the body, which is attached to the incus and means "stirrup" in Latin

When sound waves reach the eardrum, they cause the eardrum to vibrate. When the eardrum vibrates, it moves the tiny ossicles — from the hammer to the anvil and then to the stirrup. These bones help sound move along on its journey into the inner ear.

The Inner Ear: Nerve Signals Start Here
Sound comes into the inner ear as vibrations and enters the cochlea (say: ko-klee-uh), a small, curled tube in the inner ear. The cochlea is filled with liquid, which is set into motion, like a wave, when the ossicles vibrate. The cochlea is also lined with tiny cells covered in tiny hairs that are so small you would need a microscope to see them. They may be small, but they're awfully important. When sound reaches the cochlea, the vibrations (sound) cause the hairs on the cells to move, creating nerve signals that the brain understands as sound. The brain puts it together and hooray! You hear your favorite song on the radio.

Day or Night, Ears Keep You Upright
Ears do more than hear. They keep you balanced, too. In the inner ear, there are three small loops above the cochlea called semicircular canals. Like the cochlea, they are also filled with liquid and have thousands of microscopic hairs. When you move your head, the liquid in the semicircular canals moves, too. The liquid moves the tiny hairs, which send a nerve message to your brain about the position of your head. In less than a second, your brain sends messages to the right muscles so that you keep your balance.

Three Cheers for the Ears!
Your ears take care of you, so take care of them. Protect your hearing by wearing earplugs at loud music concerts and around noisy machinery, like in wood or metal shop at school. Keep the volume down on your stereo, especially if you're in the car or wearing headphones.

This Month's Activities

Sept. 4th- I'm All ears

Sept 10th-Sound waves part 1

Sept 19th- Sound Waves part 2

Sept 27th- Why do I get dizzy?

Sept 30th- Soft and Loud Sounds