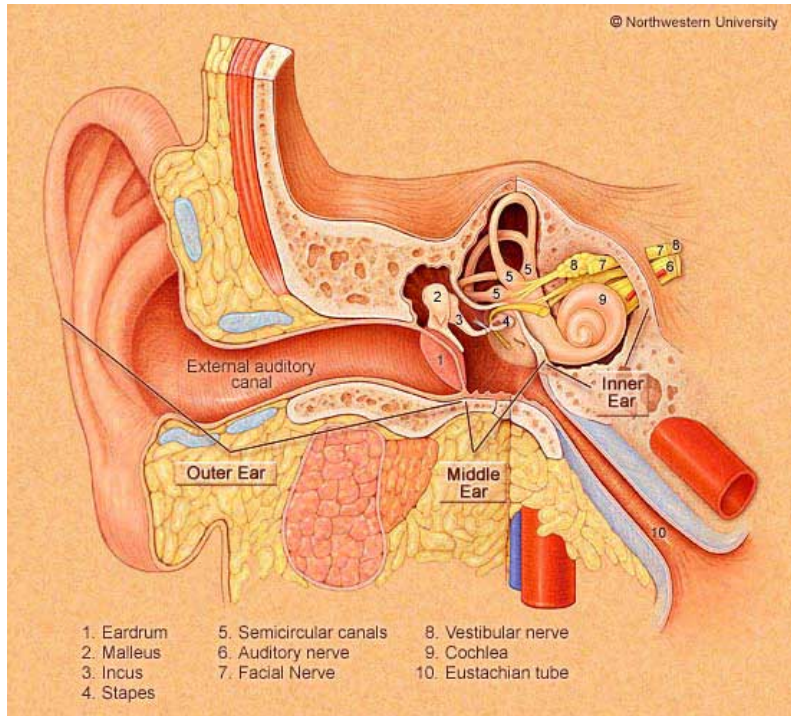


**Notes: Ear**

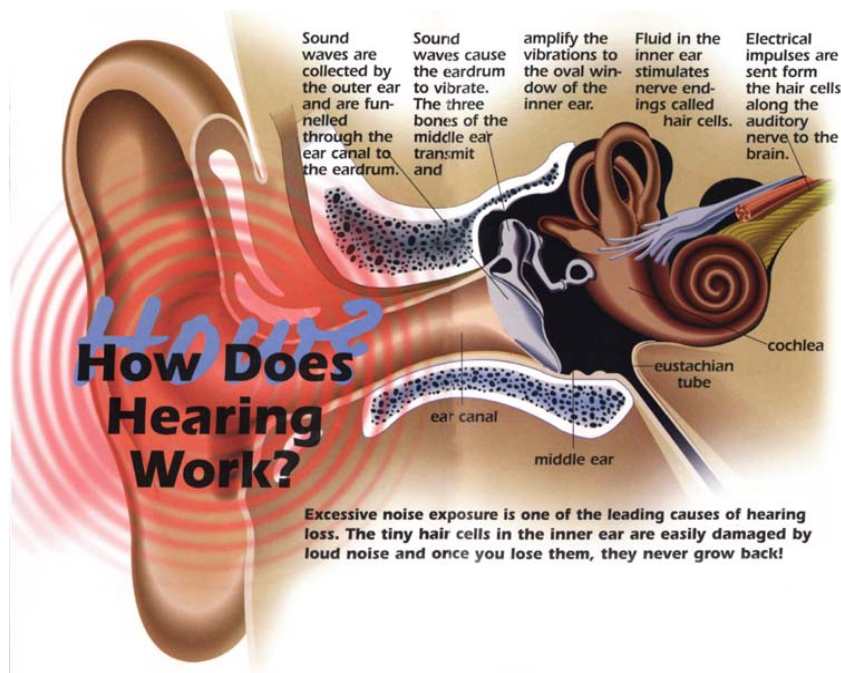


Source:  
[http://www.yungmd.com/images/info\\_ear\\_diagram.jpg](http://www.yungmd.com/images/info_ear_diagram.jpg)

The **EAR** is really two sense organs in one. It not only detects **Sound Waves**, it also senses the position of the head, whether it is still, moving in a straight line or rotating. The ears serve two functions: **hearing** and **equilibrium**.

Sound is nothing more than vibrations in the air around us. Deep low-pitched sounds result from slow vibrations. High-pitched sounds are caused from faster

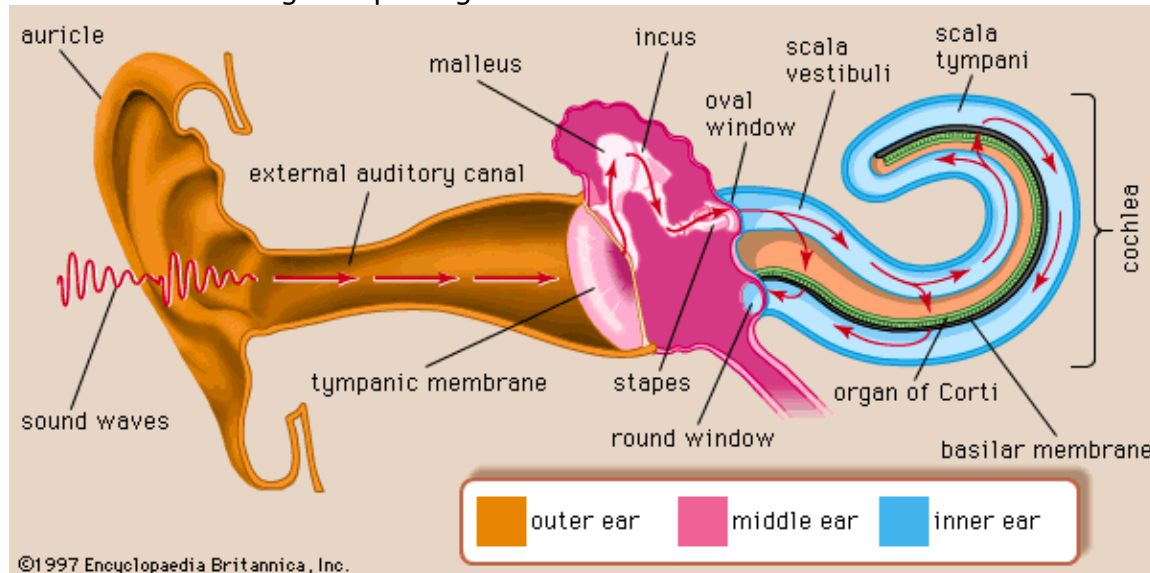
vibrations. In addition to pitch, sounds differ by their loudness or volume. The ears can distinguish both pitch and loudness of sounds.



Source:  
[http://www.hearingtestlabs.com/how\\_lg.jpg](http://www.hearingtestlabs.com/how_lg.jpg)

The **external ear** consists of the visible fleshy part helps to collect sound waves and funnel them into the **auditory canal**. The auditory canal connects the external ear with the tympanic membrane which is also called the eardrum. The auditory canal contains small hairs and wax-producing glands that prevent foreign objects from entering the ear.

The auditory canal extends into the bone of the head, but stops at the tympanic membrane. The eardrum is the beginning of the **middle ear**. Sound vibrations strike the **EARDRUM** and are Transmitted through **THREE TINY BONES: THE malleus, incus and stapes**. The stapes transfers the Vibrations to a thin membrane covering an opening called the oval window.



This Membrane transmits the vibrations to the cochlea which begins the inner ear. The cochlea is snail-shaped, consisting of three fluid-filled chambers that are separated by membranes. The middle chamber contains the **organ of Corti**, which is the organ of Hearing.

When the fluid vibrates, tiny hair cells lining the cochlea are pushed back and forth, providing stimulation that is turned into nerve impulses. Note the role of hair cells in the process of hearing.

These nerve impulses are carried to the brain by the auditory nerve. The ears also contain structures for detecting stimuli that make us aware of our movements and allow us to maintain our balance.

Located within the inner ear just above the cochlea are three tiny canals that lie at right angles to each other. They are called the **semicircular canals** because they each make half a circle. The semicircular canals and the two tiny sacs located behind them help us to sense balance and equilibrium. Both the canals and the sacs are filled with fluid and lined with hair cells (**mechanoreceptors**). The movement of fluid bends the hair on the hair cells, and in turn sends the impulses to the brain that enable it to determine body motion and position