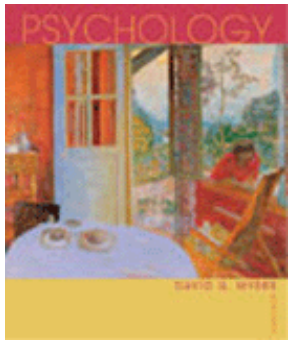
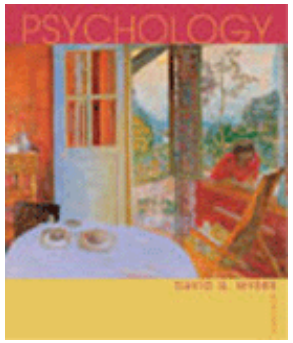
Audition

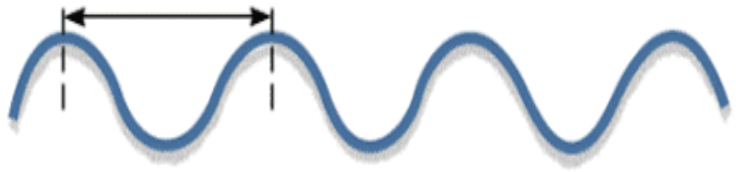


- Audition
  - the sense of hearing
- Frequency
  - the number of complete wavelengths that pass a point in a given time
- Pitch
  - a tone's highness or lowness
  - depends on frequency

Vision- Physical Properties of Waves



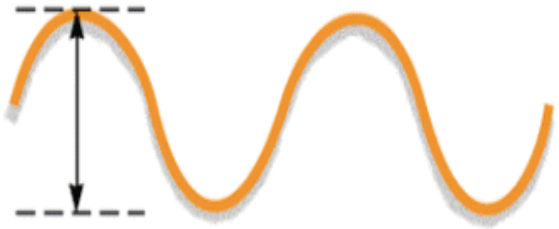
Short wavelength=high frequency
(bluish colors, high-pitched sounds)



Long wavelength=low frequency
(reddish colors, low-pitched sounds)

(a)

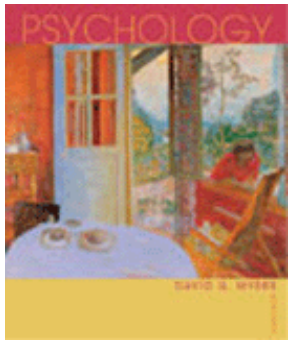
Great amplitude
(bright colors, loud sounds)

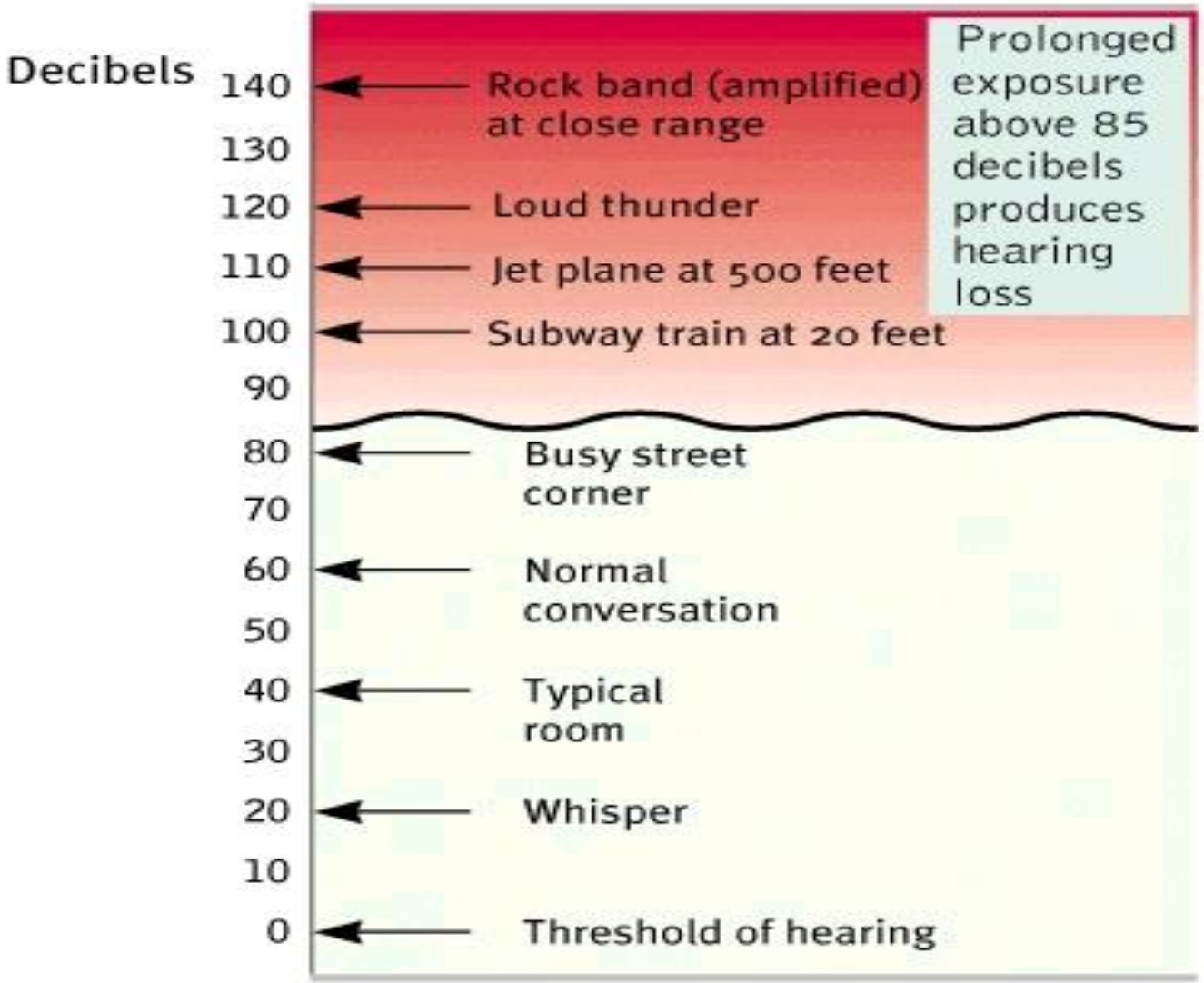


Small amplitude
(dull colors, soft sounds)

(b)

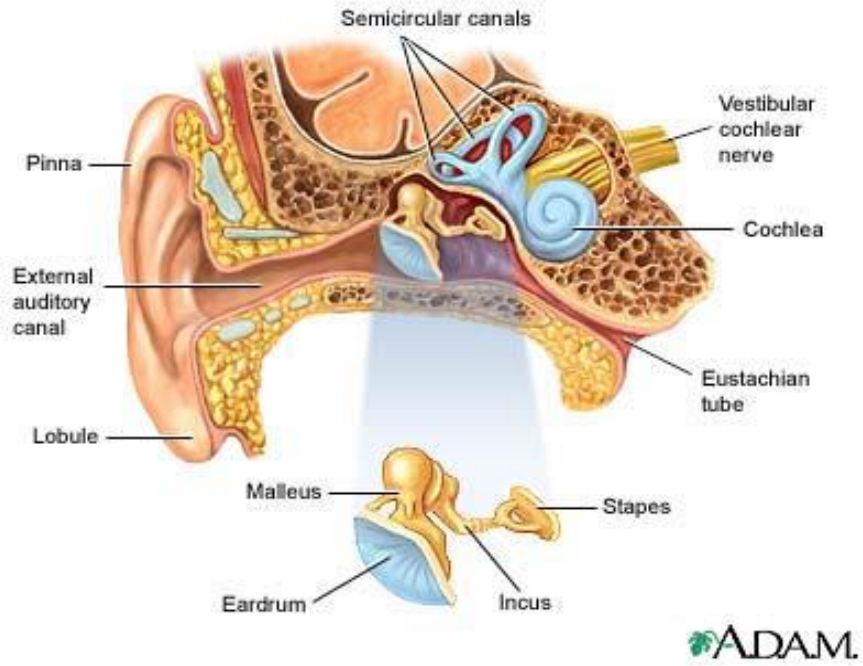
The Intensity of Some Common Sounds

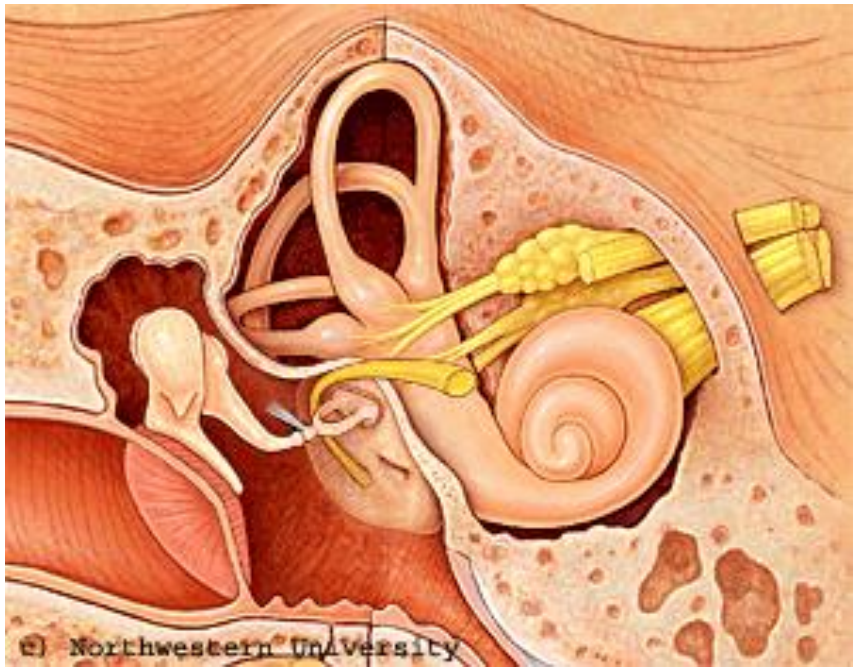




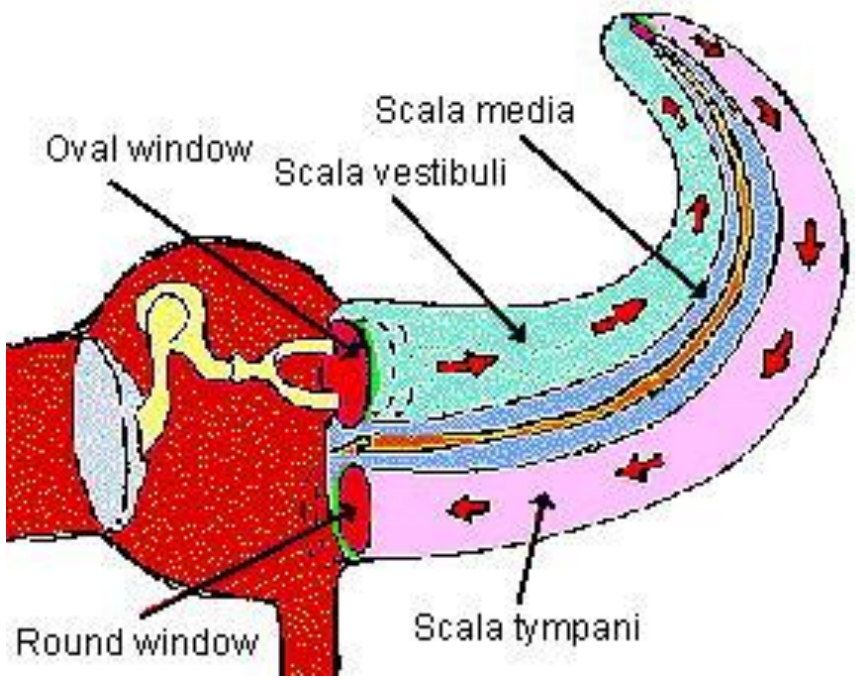
There are three parts to the ear: OUTER EAR, MIDDLE EAR, and the INNER EAR.

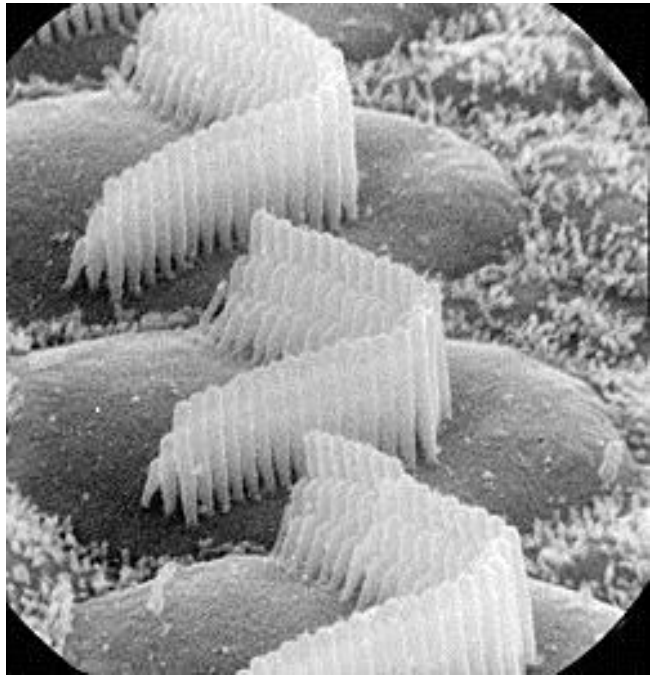
- The **outer ear** is composed of the PINNA the AUDITORY CANAL and the TYMPANIC MEMBRANE (EAR DRUM). The function of the outer ear is to <u>focus the sound waves</u> to the middle ear.
- The **middle ear** is composed of three bones, collectively called **ossicles**: the HAMMER (MALLEUS), the ANVIL (INCUS), and the STIRRUP (STAPES). The function of these bones is to <u>amplify the soundwaves</u>.
- The **inner ear** is composed of the COCHLEA and the SEMI-CIRCULAR CANALS. The COCHLEA is involved in hearing, whereas the SEMICIRCULAR are involved in balance.





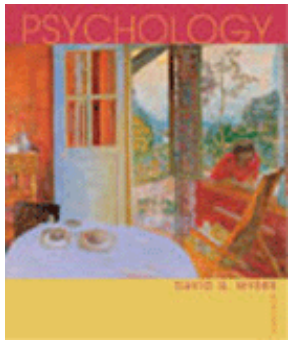
Inside the cochlea, there is a membrane (called the BASILAR membrane) covered in tiny HAIR CELLS Amplified sound waves causes waves in the fluid of the cochlea, bending hair cells on the basilar membrane, opening ion channels and sending a neural message to the thalamus via the AUDITORY nerve. From there, the message is passed to the auditory cortex in the TEMPORAL lobe.





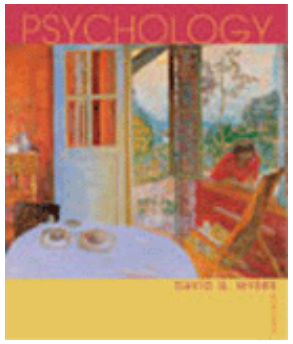
Hair cells

Audition- The Ear



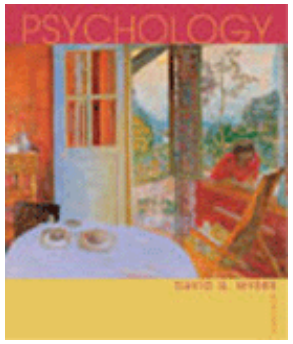
- Middle Ear
  - chamber between eardrum and cochlea containing three tiny bones (hammer, anvil, stirrup) that concentrate the vibrations of the eardrum on the cochlea's oval window
- Inner Ear
  - innermost part of the ear, contining the cochlea, semicurcular canals, and vestibular sacs
- Cochlea
  - coiled, bony, fluid-filled tube in the inner ear.

Audition



- Place Theory
  - the theory that links the pitch we hear with the place where the cochlea's membrane is stimulated
- Frequency Theory
  - the theory that the rate of nerve impulses traveling up the auditory nerve matches the frequency of a tone, thus enabling us to sense its pitch

Audition



- Conduction Hearing Loss
  - hearing loss caused by damage to the mechanical system that conducts sound waves to the cochlea, example, a punctured eardrum, stiffening of the middle ear bones
- Nerve Hearing Loss (SENSORINEURAL)
  - hearing loss caused by damage to the cochlea's receptor cells or to the auditory nerve, caused by aging or prolonged exposure to loud noises

Hearing Review

The sense of hearing is also known as the AUDITORY system.

Sound travels in **waves** and aspects of these waves determine the sound we hear.

1) FREQUENCY -- (number of waves per second) determines the PITCH
2) AMPLITUDE -- (height of the wave) determines the VOLUME