

# **NOTES on 16.4**

# **How You Hear Sound**

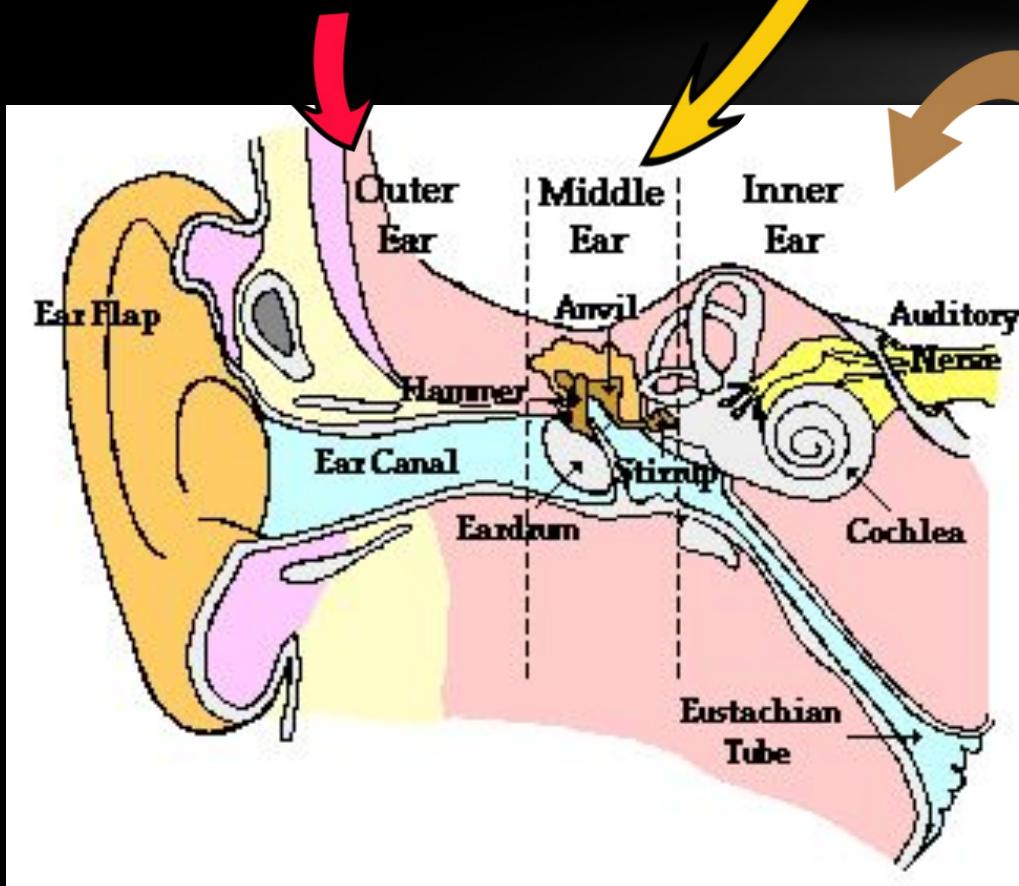
*Chapter 16 Sound*

The function of your ear is to gather sound waves and send, or transmit, information about sound to your brain.

There are 3 main sections of the ear:

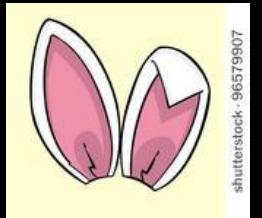
OUTER EAR: funnels sound waves

MIDDLE EAR: transmits the waves inward

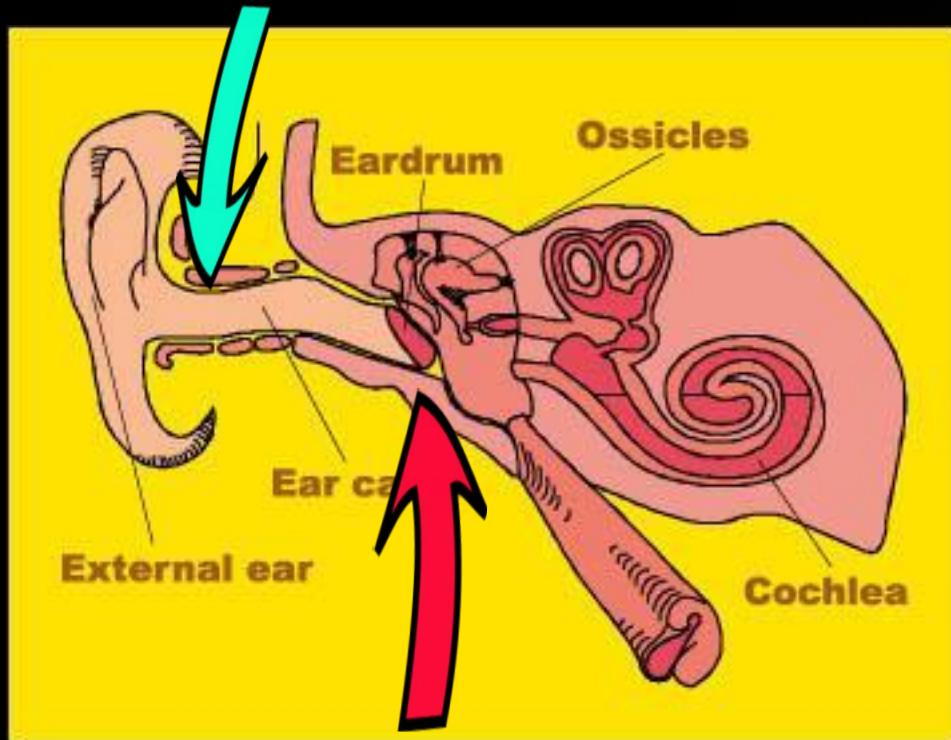


INNER EAR: converts sound waves into a form that travels to your brain.

## Outer Ear



This collects sound waves and directs them into a narrow region called the **ear canal**, which ends at the **ear drum**.

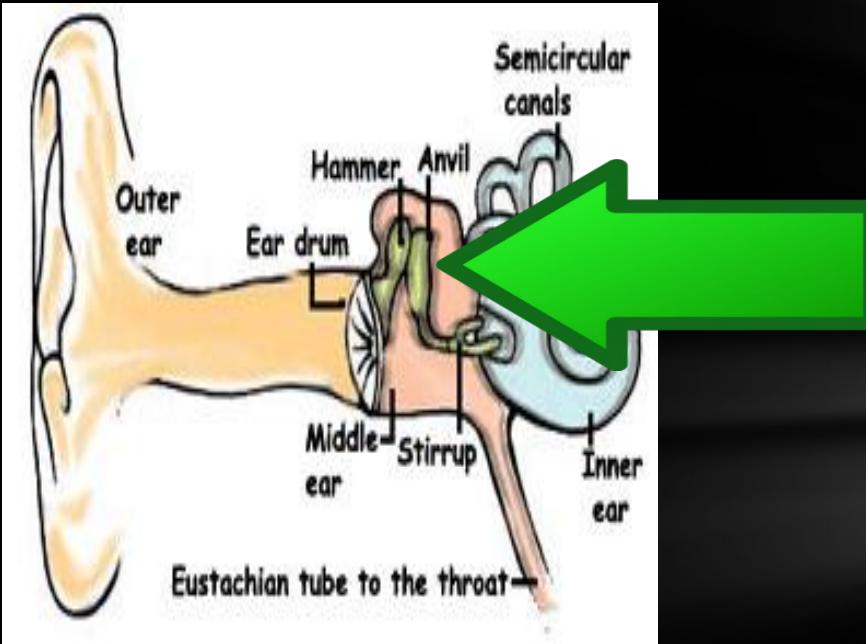


The **eardrum** is a small, tightly stretched, drum-like membrane. Sound waves make this vibrate.

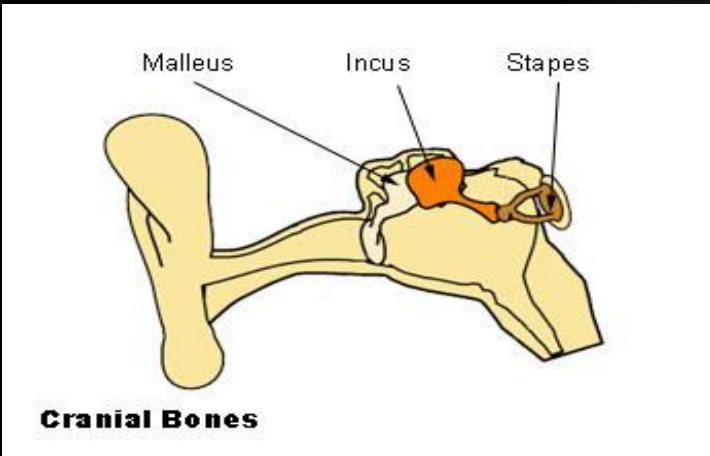


# Middle Ear

## H. A. S.



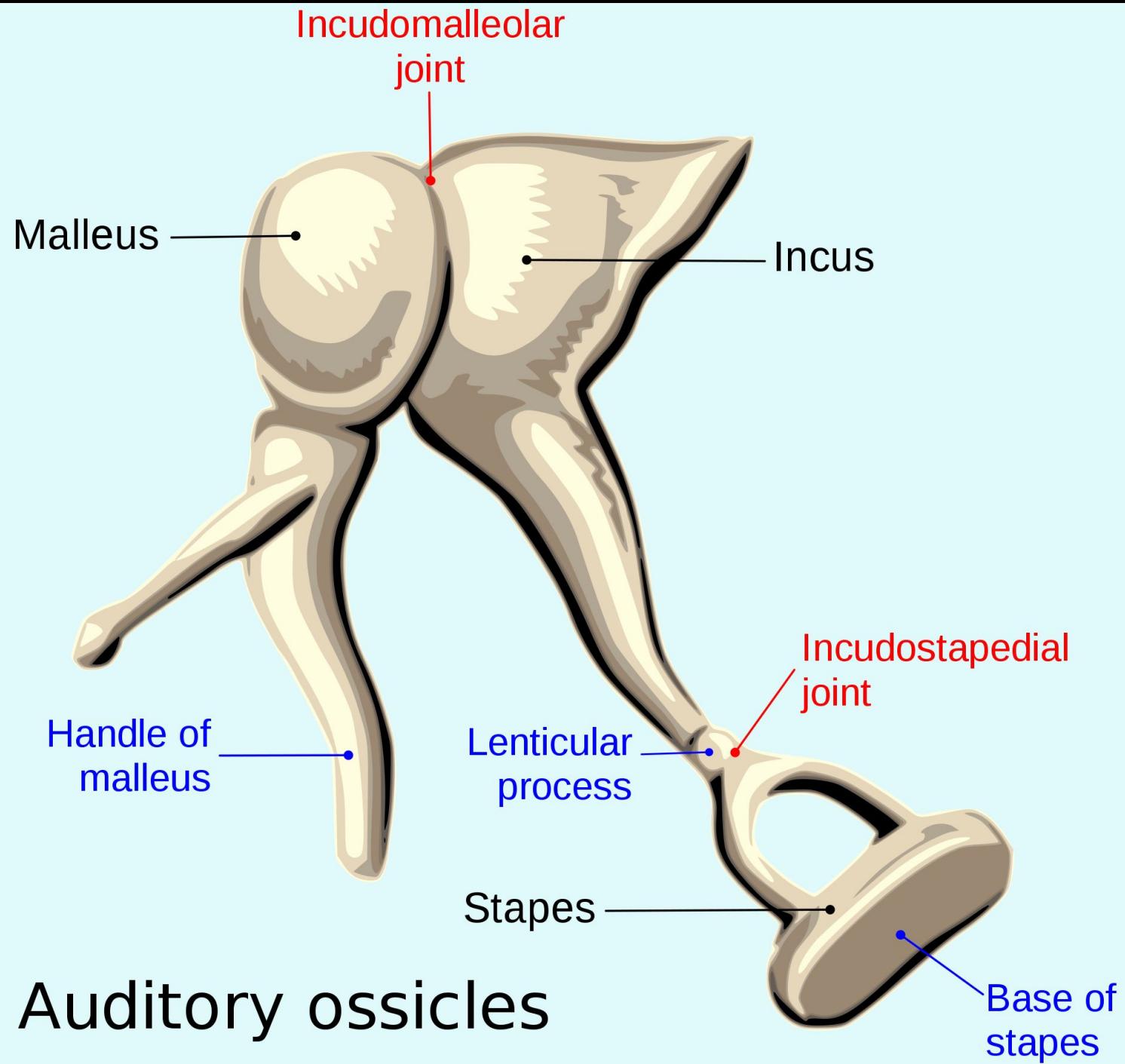
Otherwise known as:



The Middle Ear contains the 3 smallest bones in the body: **the hammer, the anvil, and the stirrup.**

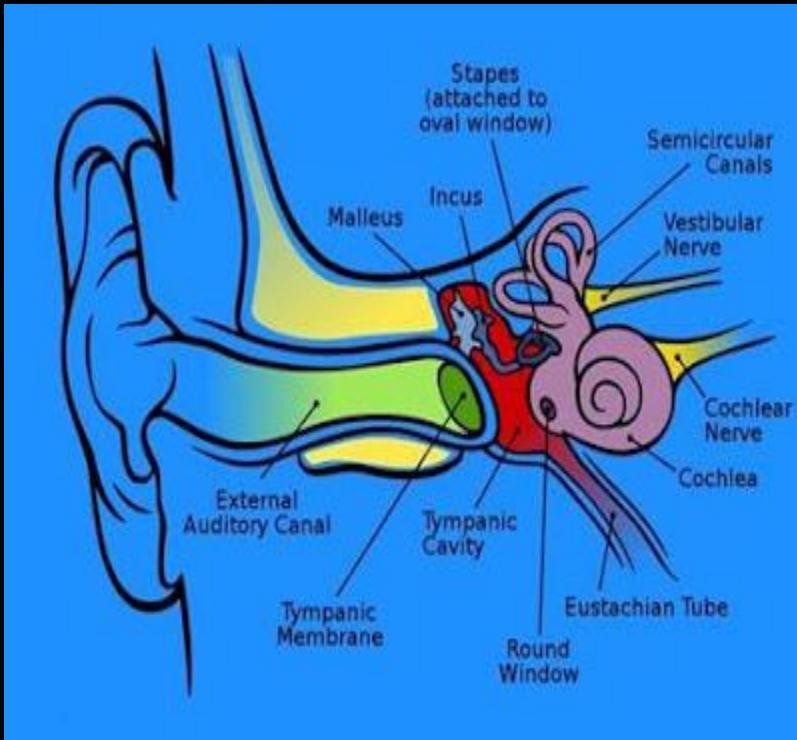
The hammer is attached to the eardrum, so when the eardrum vibrates, the hammer does too.

Then, the hammer transmits vibrations first to the anvil then to the stirrup.

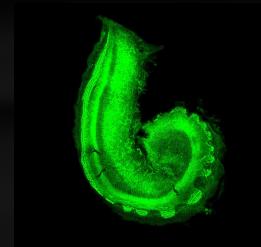


## Inner Ear

A membrane separates the middle ear from the inner ear.



The stirrup vibrates against this membrane, passing vibrations onto the cochlea.



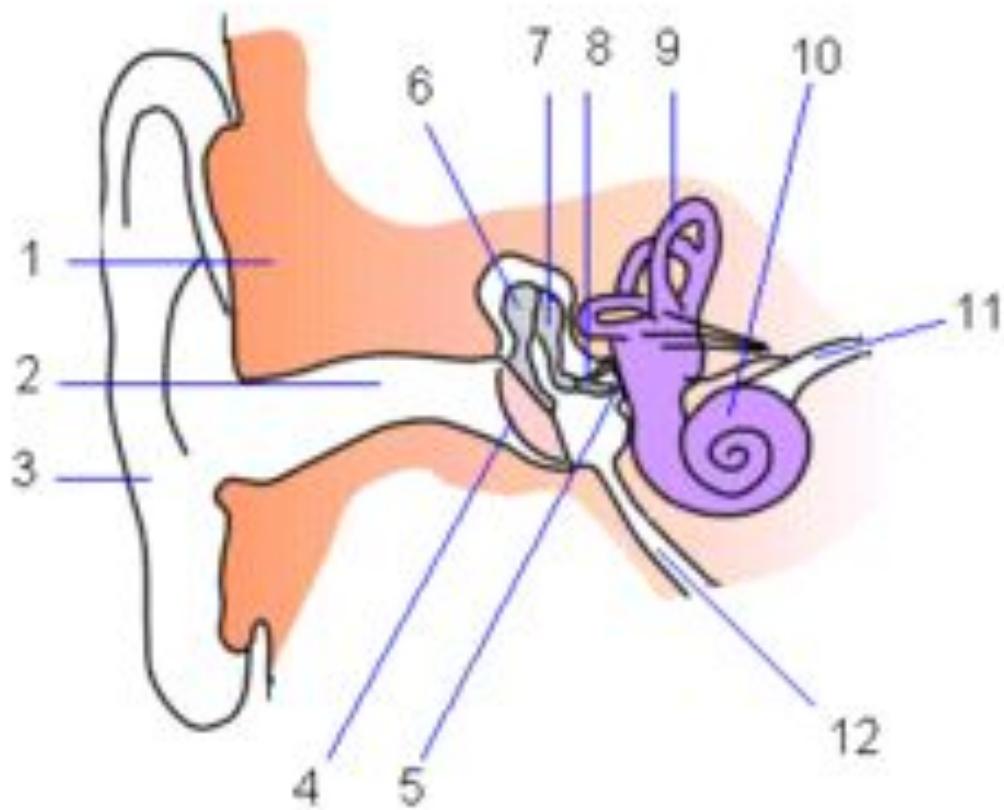
The cochlea contains more than 10,000 hair cells.

These hair cells have hair-like projections that float in the fluid of the cochlea.

Then the vibrations move through the fluid, the hair cells move, causing messages to be sent to the brain through the auditory nerve.



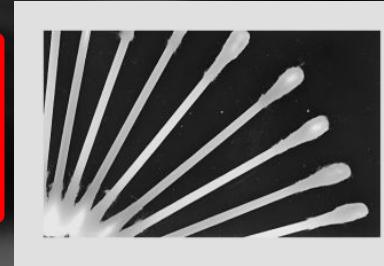
The brain processes these messages and tells you that you have just heard sound!



There are many causes of hearing loss, including injury, infection, exposure to loud sounds, and aging.



Don't stick things in your ear!  
This can damage your ear drum.



Infections can damage the inner ear,  
causing permanent hearing loss.

The most common type of hearing loss occurs gradually with age. The hair cells in the cochlea die and are not replaced. This results in difficulty in hearing high-frequency sounds.



Rest in peace, hair cells. Here comes Mighty Mouse!



*Actually,  
hearing  
aids are  
on the  
way!*