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Model of the Ear

The ear is an evolutionary component of the general senses that has given organisms the ability to hear. Hearing is crucial to the survival of certain organisms, because it helps animals better understand their current environment. The ear also contains sections that help control balance and gravity awareness.

There are three main sections that make up the ear: the external ear, the middle ear, and the inner ear. The external ear contains an auricle and an external acoustic canal, which helps send sound waves into the middle ear. The auricle and external acoustic canal act as a funnel, and help trap sound for better hearing capabilities. Lining the canal are ceruminous glands, which create cerumen and help prevent infections deep inside the ear.

Sound waves travel down the external acoustic canal until they meet the tympanic membrane (eardrum), which is what separates the external ear from the middle ear. The function of the eardrum is to convert sound waves into mechanical energy by vibrating. Attached to the eardrum are three different bones (auditory ossicles): the malleus/hammer, the incus/hammer, and the stapes/stirrup. They sit in a cavernous area, with an auditory tube leading downward. Each bone is connected to one another, and move back and forth based on the vibrations of the eardrum. The stapes then hits

the oval window, which is a small hole on the outside of the inner ear. In the middle ear is also the eustachian tube, that connects the middle ear to the nasopharynx (The nasopharynx consists of the upper throat and the back of the nasal cavity). The tube helps control the pressure maintained within the middle ear.

Finally, the inner ear contains a bony labyrinth, which is subdivided into three parts: the vestibule, the semicircular canals, and the cochlea. The vestibule helps create sensations of gravity, balance, and linear acceleration; the semicircular canals are stimulated by head rotation, and the cochlea helps send messages to the brain regarding sound. Within the cochlea are hair cells, which sends messages to the vestibulocochlear nerve, which subsequently sends a message to the temporal lobe where it is interpreted.