

Structure		Outer ear		Middle ear (cont)		Inner ear (cont)	
3 regions	outer	Pinna (ear flap)	flap of cartilage covered by skin		swallowing to open it to allow air to enter or leave middle ear	sensory hair cells	detection of head movements
	middle						
	inner		collects sound waves in surrounding		equalised the pressure on either side of eardrum		stimulated, send nerve impulse to brain
How we hear			directs them along auditory canal to eardrum	Unequal pressure	eardrum will bulge		brain coordinate muscled to maintain body balance
Sound waves	collected by pinna are directed to eardrum				bulging eardrum cannot vibrate freely		
	causes eardrum to vibrate	Auditory canal	produces wax		cannot hear clearly		
Earbones	amplify and transmit vibration to oval window	wax	lubricates canal	Inner ear			
Oval window	vibrates		traps dirt and bacteria to prevent them entering the middle ear	Cochlea	for hearing		
	cause perilymph in cochlea to vibrate	Eardrum	thin, elastic membrane at the end of auditory canal		coiled tube with three parallel canals separated by membranes		
	vibrations in perilymph is transmitted to endolymph of cochlea		convert sound waves to vibrations	perilymph	fluid in upper and lower canal		
Sensory hair cells (central canal)	stimulated	Middle ear		endolymph	fluid in central canal		
	generate nerve impulses	Ear bones	3 tiny ear bones	sensory hair cells	in central canal		
			smallest bones in body		detects vibrations of endolymph		
produce sensation of hearing	nerve impulses travel along auditory nerves to auditory centre in brain		amplify and transmits vibration from eardrum to oval window	endolymph vibrates	sensory hair cell hairs are bent		
	vibration in perilymph transmitted to round window	Oval window	flexible membrane		sensory hair cells generate nerve impulses		
Round window	releases fluid pressure in the cochlea to the air in middle ear		transmits vibration from ear bones to inner ear		nerve impulses travels along auditory nerves to auditory centre in brain		
		Round window	releases fluid pressure in cochlea into the air	Semircular canals	not involved in hearing		
		Eustachian tube	tube connecting middle ear to pharynx				
			normally closed				