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a.	Structures used to detect vibrations
Fish	lateral line, labyrinth
Mammals	Ears
Insects	Tympanum

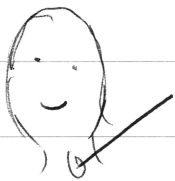
b.



when a person sings a high pitched note
 the vocal folds are pulled tight



vocal folds are pulled tight



vocal folds are relaxed

when a person sings a low
 pitched note the vocal fold
 are relaxed



c. i. retina macula/fovea photoreceptors

ii. Cones are most densely packed in the fovea. This is the area of the greatest visual acuity accuracy. Cones here need to have a larger outer segment so there is more visual purple (pigment) when absorbing light than the cones that are packed around the rest of the retina.

iii. The role of rhodopsin in rods is mainly to absorb light. This ~~is~~ ~~is~~ rhodopsin changes light into an electrochemical signal which activates a nerve impulse. Rhodopsin ~~is~~ consists of two parts a retinal and opsin. In rods this is scotopsin. When rhodopsin moves from resting state to excited state the retinal and opsin split sending a ~~nerve~~ nerve impulse to the brain through the optic nerve.

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di. stimuli might not be strong enough (below the threshold) to create an action potential

- The fall may have caused brain damage, not allowing the brain to function adequately.

- The brain may need much stronger stimuli in order to gain an action potential.

ii. This condition could change the behaviour of the mammal as:

- memory could be affected
- senses could be affected
- the command control centre could be affected.

All these factors will change the behaviour of the mammal as memory may be blurred and unable to remember. Unable to use senses such as smell, sight, sound adequately and the functions they want the body to carry out may not be done adequately.

e. Our eyes and ears are very complex. The understanding of the eye and the ear has led to the development of technologies such as 3D glasses.

The understanding of the ~~start~~ structures of the ~~our~~ eyes and how they function have allowed for technologies such as laser eye surgery and glasses.

The understanding of how the eye refracts light onto the retina shows how images are formed. Myopia is ~~is~~ when an individual can not see far distances, but can see close ones. The reason for Myopia includes:

- lens may be too rounded
- eyeball may be too long
- refractive power may be too great or does not function adequately.

Because ~~we~~ understanding^{at} the eye we are able to correct myopia using technology such as glasses and laser eye surgery.

Myopia can be fixed using concave lenses. This allows the light rays to diverge before they reach the eye,

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and increasing the focal length so that the image will fall ~~in~~ ^{on} ~~front~~ of the retina and not in front of it. Laser eye surgery will allow the shape of the cornea to be adjusted to allow refraction of light to occur normally and on the retina.

Hyperopia is the opposite to myopia. Long distances and short distances appear

blurry. This is due to:

- the ~~eyeball~~ ^{lens} being too elongate
- eyeball being too rounded
- refraction power of cornea and lens being inadequate

Because of the understanding of the eye, hyperopia is easily fixable.

Hyperopia is fixed by ~~use~~ wearing glasses with a convex lens. This allows the lights to converge before they reach the eye, shorting the focal length and allow the image to fall on the retina and not ~~in~~ behind it.

Laser eye surgery will allow the shape of the cornea to be adjusted to allow refraction of light to occur normally and on the retina.

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The understanding of how the lens works has allowed development technologies to cure diseases such as cataracts. Cataracts occurs when the lens becomes opaque. Due to technological developments it is easy to replace the lens with a plastic one in ~~an~~ only 30 minutes and the cost of this is incredibly inexpensive. This has helped people in poverty who have been a burden on families. They are now able to live normal lives, work and help family out.

~~The understanding~~ Humans have two eyes seeing slightly different angles at an image. This is called binocular vision. Because of the understanding of depth perception technology is able to allow us to watch in 3D. It also allows to play tricks on the eyes and create illusions.

The understanding of the eye has therefore led to development of technologies that allow individuals to experience sight

different~~ly~~. Glasses, laser eye surgery, cataract treatment and 3D glasses have all helped those whose eyes to function adequately and it has helped increase the level of wellbeing ~~experience~~ and standards for ~~people~~ these people.

The ears are very complex organs in the human body. The understanding of the function of the ear as well as its structure have allowed technology to ~~enhance~~ our experience of sound. Technological gadgets that have been developed include hearing aids, cochlear implants, and we are now able to enjoy surround sound.

The understanding of how sound waves travel into the ear have helped greatly in understanding the ears functions. However, some individuals ears do not function adequately and this can be because:

- ear ossicles have been damaged
- hair cells are damaged - (hair cells are

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finitie, once they are damaged they are lost forever)

• tympanic ~~may~~ membrane may not function adequately.

Because of the understanding of the ear technology has lead to ~~be~~ hearing aids and cochlear implants.

Hearing aids are devices that go onto an individual's ear and amplify the sound being produced so their can be a reaction. These has also developed ~~is~~ assisted features such as:

• individuals can ~~try~~ turn up hearing to volume as they please

• background noise can be cut out however this can only used by

~~cochlear~~ certain individuals and depends

on how much the individual can't

hear. A hearing aid consists of

a microphone, amplifier and a remote; these are not expensive

Cochlear ear implants are more complex than a hearing aid. A microphone gets drilled inside the skull and the individual carries a receiver. This is much more

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suited for individuals who have already learned a language. This isn't as sensational as normal hearing and the individual will have to interpret the sounds made (it is like learning a new language). Many children who have this need therapy and lots of training. However even with all these downsides an individual will be able to hear and can enhance their general wellbeing. These can be quite expensive ~~and~~ but allow individuals to not only rely on visual communication.

Sound waves pass through the ear in the following order: pinna → tympanic membrane → ear ossicles → round window/oval window → cochlea → organ of Corti → auditory nerve (which is sent to the brain to be interpreted).

Cochlear implants and hearing aids help this to be possible by either amplifying sound or creating sound waves. These ~~the~~ technologies have come ~~at~~ about by the increase in understanding of the ears.

Our understanding of sound shadow

allow us to understanding that unless sounds comes ~~di~~ from directly in front or behind you, ~~to~~ one ear is able to hear more sound than the other. Our head blocks one side of when sound travels allowing one ear to hear more sound. Because ~~we~~ we know how sound shadows we are able to develop technology such as surround sound in the movies ~~to~~ to reach both ears at maximum instead of one ~~as~~ ear more. This enhances the sound heard by individuals at the movies.

The understanding of the ear has therefore led to development of technologies that allow individuals to experience sound different. Hearing aids, cochlear implants and surround sound have helped those who ears function inadequately and helped increase the level of wellbeing and stand ^{ards} ~~ards~~ for these people.

In conclusion the understanding of the eye and the ear has lead to the development at

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technologies to assist individuals whose eyes or ears don't function normally and to enhance the experience of sound and sight.

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