

a) i) The Corti fills the function of transferring wave signals from the oval window to the cochlear. The Corti's function is extremely important as without it sound would not be able to pass into the inner-ear making hearing extremely difficult.

ii) The wavelength, frequency and pitch all relate together which produce the final sound we hear. The longer the wavelength is the lower the ~~sound~~ frequency is and the ~~lower~~ deeper the pitch which produces a lower sound which is detected at the back of the cochlear. The shorter the wavelength is the higher the frequency is and a higher pitch of sound is produced creating a higher note sound. The lower the sound the further it travels whereas a higher sound will travel a shorter distance.

iii) Human	Grasshopper
◦ Air from the lungs is controlled to come out at different frequencies causing the voice box to vibrate creating sound.	◦ Rubs hairs to on front legs to produce clicking sound.
◦ Lower pitch sounds are produced when the airway is more open	◦ Constant sound caused by vibrations and hairs breaking speed of sound
◦ Higher pitched sounds are	◦ External ◦ Does not use air or any structure that controls air.



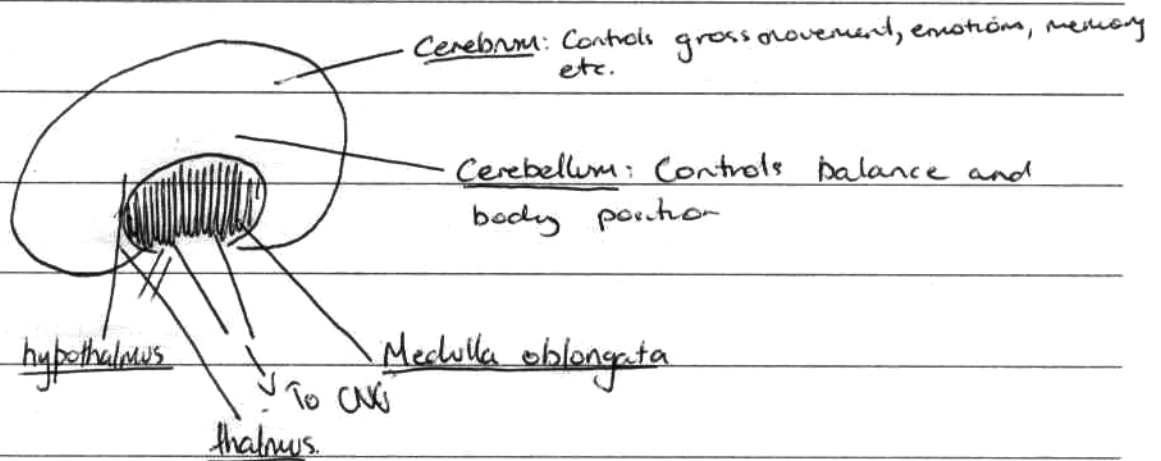
Human cont'd.	Grasshoppers (cont'd)
produced when the larynx is more closed.	Used for communicating over long distances
◦ Tongue, mouth and lips are used to produce unique sounds to the human	
◦ Internal	

b) i) Cerebrum: The cerebrum could be identified as the soft external wall of the brain. This part of the brain has a white-grey colour texture and is the most external part from the center of the brain. This part of the brain also covers the most area of the brain.

Cerebellum: If the cerebrum has been identified, it is possible to identify the cerebellum as it is the layer of brain beneath it. ~~It occurs in the~~ It appears as the same colour as the cerebrum but more towards the rear half of the brain.

Medulla oblongata: The medulla oblongata is the light brown coloured part of the brain that appears as being the core of the brain. This is where the nerve endings of the central nervous system run off to the brain.

ii)



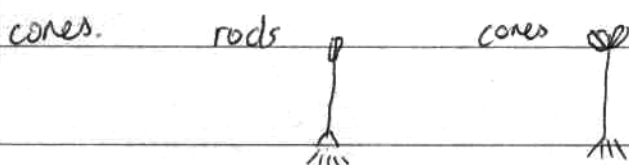
c) i) on graph

ii) From the graph, it is possible to say that the greater the thickness of the lens the shorter the focal length is. The thinner the lens the longer the focal length.

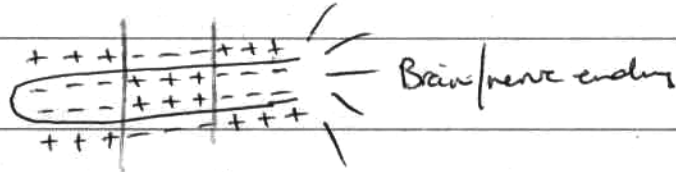
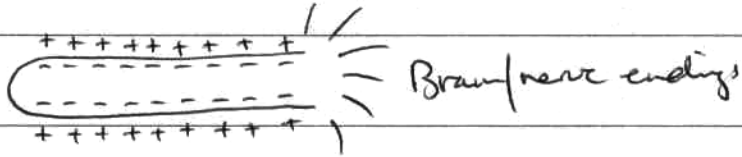
iii) The human lens is not made out of a hard substance but rather a semi malleable one. Attached to it are the ciliary ligaments which help focus on objects. When the ligaments are contracting the lens is pulled upon making the lens eye able to focus on objects far away. When the ligaments are relaxed the lens becomes thicker in diameter and objects that are close become easier to focus upon.

d) Light signal reaching the retina is transformed into electrical chemical signals through the use of photoreceptors and rhodopsins.

When the light hits the retina, it hits ~~the~~ photoreceptor cells which are scattered across the retina. The two types of photoreceptor cells are rods and cones. There are 125 million cones to 6 million ~~cones~~ rods in the eye. Cones are in greater numbers ~~in the~~ around the fovea as they are colour sensitive and are what give visual acuity. There are ~~three~~ three types of cones all of which are sensitive to different colours. These are Red, Blue and Green. Rods however are ~~not~~ not sensitive to light and work best in dim light. They ~~are~~ are in greater numbers away from the centre of the retina. Cones have up to 3 but generally 2 endings to one nerve which enables the greater acuity whereas rods only have 1 nerve to 1 ending. Rhodopsins are the chemicals in which transform the light signal that reach the retina into electrosignals. In bright light Rhodopsins can not produce acuity enough to transport the light to the optic nerve. Rhodopsins are what converts the light into electrochemical signals and are present in rods and



Nerve endings which produce electrochemical signals



rhodopsins movement and how they are transformed

into electrochemicals.

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Biology

Question 28 c)i) - Communication

This page is to be detached, completed and attached to the inside front cover of your writing booklet for the option question you have attempted.

The thickness of lens compared to the Focal length distance

