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a)

| organism | structure to detect vibrations. |
|----------|---|
| mammals | <ul style="list-style-type: none"> - detect vibrations through the ear drum in the ear, which is then sent through the ^{ear to the} auditory nerve to be interpreted by the brain - some mammals are known to detect vibrations through their stomach if they are low laying mammals. |
| Fish | <ul style="list-style-type: none"> - Have vibration receptors down their sides ^{near the gills.} to detect vibrations as they travel through the water. - sound is picked by up by vibrations in the water allowing fish to gain understanding of what is around them. |
| Insects. | <ul style="list-style-type: none"> - Use vibrations a lot in communication - different insects have different structures that pick up vibrations - Grasshoppers produce vibrations with their hind legs and pick up vibrations on their stomach - worms use vibrations detected through senses on their stomachs to feel their way through the soil |

b)

diagram 1

High Pitched Note.

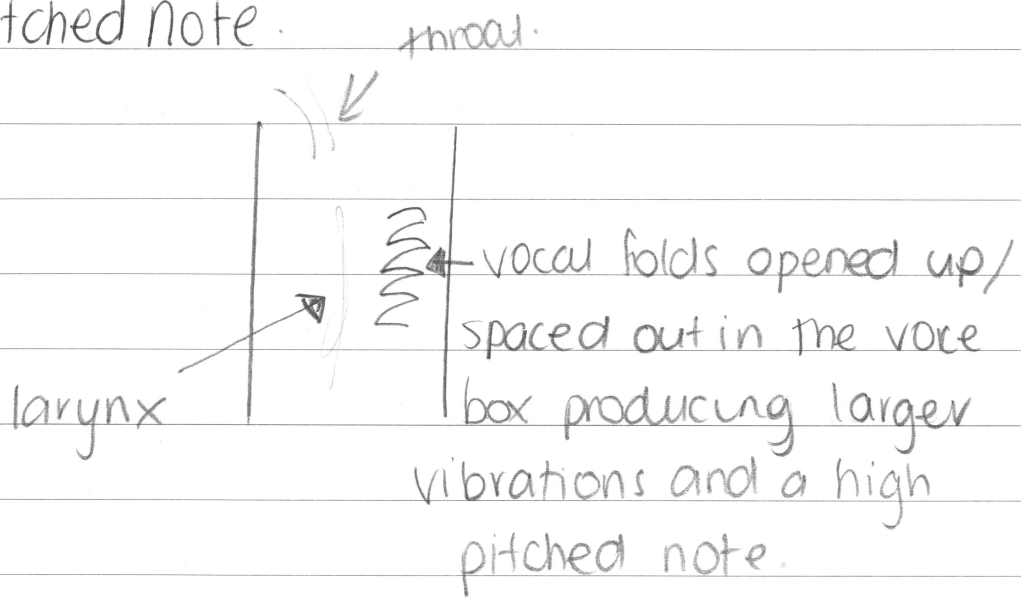
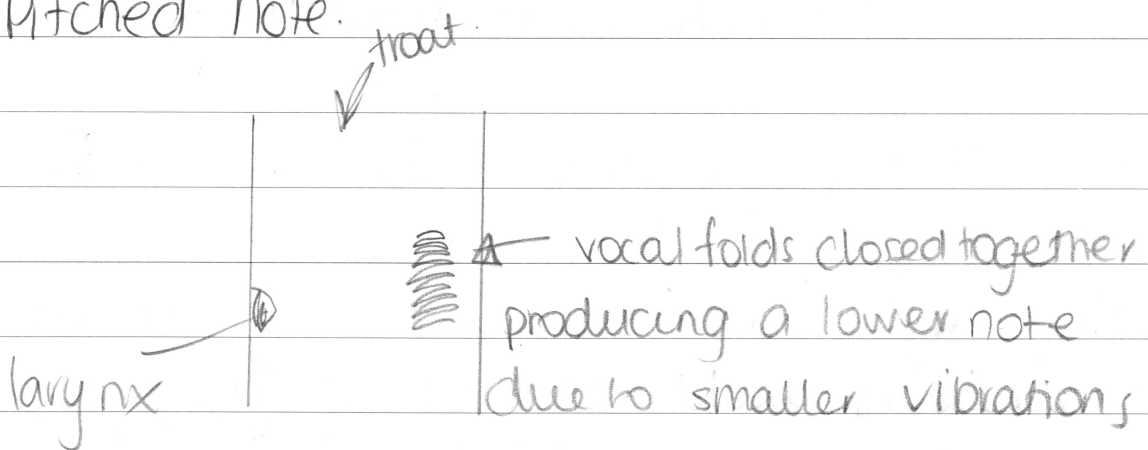


diagram 2.

Low Pitched Note.



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C. (i) ~~cones~~ retina.

(ii) The structure of cones varies depending on their location in the retina for different areas of the retina require different levels of light to be interpreted. As the light is refracted in the eye the cones pick up the colour and light signals in order to make a clear picture. They are more concentrated at the back of the eye for that is where the most light gets refracted and so more are needed here to create the best picture possible.

(iii) Rhodopsin are found in rods ~~and~~ and are incredibly important in the detection of light at night. Rhodopsin split in the rods, receiving the most light possible the quickest way possible. They also absorb ^{more light than just rods on their own} ~~light~~ and absorb ^{own} extremely effectively, an essential trait when detecting images at night. Rhodopsin doesn't do anything associated with colour, it purely focuses on light. ~~There are hundreds of millions~~ There is Rhodopsin found in every one of the 125 million rods inside the eye.

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d)

(i) cause one: The fall damaged the section of the brain associated with sight and so not information is being processed in that one, leading to no action potential. By the occipital lobe being damaged, no messages from that area would be seen.

cause 2: The fall of the mammal damaged the medulla oblongata, again limiting the perception of information interpreted by the animal in that region. Due to having no comprehension of images or sight, an action potential regarding ~~ex~~ those things could not be developed.

(ii) The condition could greatly change the behaviour of the mammal. It would change their visual understanding of everything around it, leading it to become more likely to injure or hurt themselves ~~due~~ for they can't associate the image with danger. Damage to the occipital lobe in humans also affects their behaviour, like one disease such as dementia that

makes that area of the brain deteriorate leading to them having no recognition of people, even their own face. The danger in mammals having no perception of image is that it could no longer be left alone for it wouldn't be able to interpret the information they see leading to disorientation. It can lead to making things seem bigger than they are, potentially causing a higher risk of running into things and further injuring yourself.

e) Understanding of how the brain and eye develops depth perception has led to the development of 3D glasses. Depth perception is where each eye picks up a different image and uses the combined images to create a clear picture of the surrounds. It can be done through previous understanding of objects, the brain's and eyes ability to associate an object with its image and the combination of our two eyes and by the eyes & both focusing on the one object at the same time. Depth perception is incredibly effective for predatory animals and can normally

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be detected through mammals obtaining two eyes on the front of their head. By understanding this concept, the 3D glasses has been created. ~~It~~ Due to the different coloured lenses, it forces the eye to interpret ~~information~~ different information from the same image and in turn, producing a image with depth, or in other words a 3D picture. The use of the colours of red and blue were developed due to understanding of the eye as well for they are two colours that are readily picked up by the eye at a quick glance.

Understanding of hearing and sound has lead to the development of surround sound. Sound shadows are ones ~~that~~ around our ears that we may not pick up sound the most effectively for it ~~is~~ is overshadowed or protected by our head. This is effective in providing us with an understanding of where sound is coming from and how loud or soft it may be. It is often the reason why ~~humans~~ ^{mammals} turn their head a sound,

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for they are learning to allow their
ears to pick up sound outside the
confinedments of the sonic shadow.

Through the understanding of
sonic shadow, surround sound has
been created. In surround sound,

the sound waves come from all
around the individual, ~~limiting~~

limiting the chance of a sonic
shadow and completely engulfing

the person with sound that is fun
channeled through to the inner ear
and eventually the optic nerve

where it is sent to be interpreted
by the brain. By the person not

having to move to hear the sound, it
creates the feeling of being right

there amongst the image, tricking
the brain into believing the ^{created} sound is

around you.

Through the development of 3D

glasses and surround sound the

brain is tricked into creating

a new image based on the understanding
of how our eyes and ears work.

Through this, audiences can be able
to get an image that seems far
more realistic and immediate
than ever before.

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