

Communication

a i Photoreceptor cells are located on the retina at the back of the eye.

ii A - the conjunctiva - acts as a protective layer for the cornea.

B - the iris - expands or contracts to control the amount of light entering the pupil in varying light intensities.

b) (i) Two methods are possible. Firstly searching sources such as the internet & encyclopedias & journals located in a library. Secondly visiting a zoo or ~~and~~ wildlife reserve to observe the animals first hand & identify the structures that are being used to produce sound.

(ii) For the first method, it is necessary to determine: when the information was published or placed upon the World wide web; who provided the information & what research was undertaken to provide the conclusions drawn.

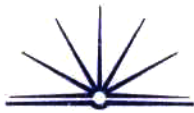
For the second method it is possible the information was subjective & the 'research' was uninformed & based



on unconvincing observation. Thus it is important to conduct further research to substantiate the claims made & illustrate they are reliable & relevant.

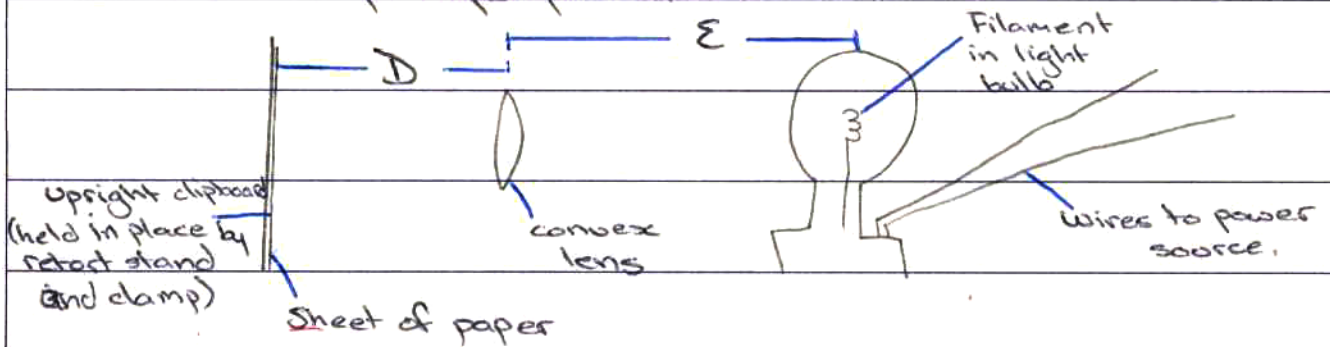
c) ^A Cataracts ~~are~~ any blurring of the lens. The lens can blur so badly that it causes blindness. There is no way to prevent cataracts, however surgical techniques can be used to overcome the effects of cataracts. Cataracts can not be treated with spectacles.

The surgery technique/technology, that is used to overcome the effects of cataracts involves the patient undergoing an operation under local anaesthetic. In the operation the persons blurred lens is removed & ~~is~~ replaced with a biconvex, intraocular synthetic lens. This restores the persons vision & the eye can function as normal.



d) Procedure:

1) Set up equipment as shown.



2) Using a thick lens, move until clear image of filament appears on paper

3) Measure distances D and E . Record results.

4) Repeat steps 2 and 3 using a thinner convex lens, but moving filament rather than lens and maintaining distance D .

Conclusion:

The thicker the lens, the closer the focal point, meaning that the object of focus is closer. In accommodation of the eye, the ciliary body will tighten to thin the lens, so as to focus on a far object, while the fatter lens will focus on a near object.

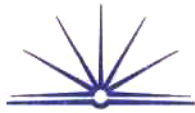
In the above procedure the paper represents the retina, the filament the image to



be focused and the convex lens the eye's lens.

JUSTIFICATION:

The procedure models accommodation ~~valid~~ in a valid ~~me~~ and reliable method as the distance between the lens and ^(paper)retinal remains constant as it does in the eye. Both lens thickness and focal length (distance E) alter due to their intrinsic relationship. Thus the procedure was a true representation of accommodation, as are any subsequent conclusions derived from it. However the procedure and consequent results may be improved by repetitions of the procedure and an intermediate lens thickness.



e) Two devices designed to assist people with hearing impairment are ~~the~~ cochlear ear implants and hearing aids. Both devices are battery operated. ~~and involve~~

Cochlear implants or the 'bionic ear' is a surgically inserted device for profoundly deaf people. It overcomes problems in the inner ear such as reduced receptors in the organ of Corti. This form of hearing assistance is expensive and the results varied. It is ~~best~~ most effective with patients who learnt to speak prior to becoming deaf and requires constant adjusting until the appropriate level of reception is determined. The device may cause trauma as the patient adapts to a new way of life. Also adverse side effects may be caused by the operation such as a droopy or numb face.

Hearing aids, on the other hand, are designed for people suffering conduction deafness in their middle ear. The device amplifies