TENDER HEART HIGH SCHOOL, SEC-33B, CHD 30 09 24

Class - 10 BIOLOGY

CHAPTER - 11 Sense Organs Teacher - Nidhi Rana

Good morning students,

This lesson is of Class 10 for the subject of Biology; Topic 'Structure of Eye' which is covered in Chapter 11 'Sense organs' starting on Page 138 of your text book titled 'Concise Biology - Selina Publications' and is being submitted to you on. 30 09 24 -

So, dear children kindly pay attention as I am going to explain the Structure of the eyeball. Each eyeball is embedded in a bony socket and is attached to the bones by 6 muscles. Only the front 1/6th portion of the eyeball is exposed. Eyeball is composed of 3 concentric layers.

(i) Outer - Sclera or Sclerotic layer
(ii) Middle - Choroid and
(iii) Inner - Retina

Now Let us learn about these layers in detail -

(i) Sclera or Sclerotic layer is thick, fibrous tissue white in colour. Students - the white portion on the front of the eye visible to us is sclera Sclera bulges out and becomes transparent in the front region, so as to enable the light to enter into the eye. This transparent region of sclera that covers the coloured part of eye is called Cornea. If this transparent cornea turns white i.e. opaque and does not allow light

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to enter into the eye, then such a defective cornea of the patient can be replaced by a healthy cornea from a donated eye.

(ii) Choroid Layer - is the middle layer of the eye that is richly supplied with blood vessels. Thus function of Choroid layer is to provide nourishment to the eye. Another function of Choroid layer is that it contains dark black pigment - Melanin which prevents light rays from reflecting and scattering inside the eye, when the light rays enter the eye.

In the front, just behind the junction of the sclera and the cornea, the choroid expands to form the ciliary body. Students may kindly see the Fig 11.2 at Page No. 139 of your textbook showing the cross section of the eye carefully for location of these parts.

Ciliary body / ciliary muscles alter the shape of eye lens. Further another extention of the choroid that partially covers the eye lens is called the Iris. The blue, black, brown colour of the eye refers to the colour of the Iris. Iris leaves a circular opening in the centre, the pupil lying just in the centre of the cornea. Iris contains radial muscles to widen and circular muscles to constrict the pupil. Thus the function of Iris is to adjust the size

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of the pupil, thus regulating the amount of light entering the eye. In the dim light iris dilates the pupil and in bright light it constricts the pupil.
The pattern and arrangement of Iris muscles is unique for every individual, just like your finger prints and therefore is used as a source of individual's identification.
Now children, we will recapitulate the important parts of the topic we have studied till now by means of a short test. I will ask you a few questions

write down their answers in your notebook. The questions are as follows:-

Q1. Name the 3 layers of eye.
Q2. Which layer of the eye provides nourishment to eye?
Q3. Which layer of the eye prevents reflection of light rays inside the eye.
Q4. Which part of the eye gives colour to the eye?

Students the 3 minutes break given for writing the answers is over. Let me first give you the answers to the questions being asked to you before the break.

A-1 3 Layers of the eye are- Sclerotic, Choroid & Retina
A-2 Choroid Layer provides nourishment to the eye.
A-3 Choroid layer prevents reflection of light rays inside the eye.

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Ans Iris gives colour to the eye. Colour of the eye basically refers to the colour of iris. Now children we will continue with the 3rd layer of the eye i.e. Retina

(iii) Retina is the 3rd and innermost layer of the eye that is sensitive to light. because it contains the photoreceptor cells i.e. the rods and the cones.

a) Rod cells are sensitive to dim light and are important for night vision They donot respond to colour and form black and white images. They contain a pigment called Rhodopsin or visual purple. Rod cells are present throughout the Retina

b) Cone cells are sensitive to bright light and are responsible for colour vision. We can differentiate various colours because of functioning of cone cells in the eye. They contain the pigment Iodopsin or visual violet. Cone cells are mostly confined to a region in the eye called the yellow spot.

Yellow spot is the region of best vision in the eye. It is also called Macula lutea. Yellow spot lies at the back of the eye almost at the centre on the horizontal axis of the eyeball. Students may again carefully look at the diagram of cross section of eye given in the book to clearly understand the location

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of Yellow spot.

Yellow spot is region in the eye that contains maximum number of sensory cells and particularly cone cells. Hence it is the area of brightest vision, especially colour vision. It is extremely sensitive to light. Rest of the Retina has fewer cones and more rods. Yellow spot is the place of best vision. This is the reason why we move our eyes from word to word as we read a line through a printed page.

Blind Spot. Like we have area of best vision similarly we have an area of No vision in the eye. It is the spot of the eye which does not have any sensory cells, hence no image is formed here and thus it is called the Blind spot. At this point the nerve fibres from all the sensory cells of Retina converge and bundle together to leave the eyeball in form of optic nerve. Blind spot is located lateral to the yellow spot on the nasal side.

Before we go further in the chapter, it is the question time again children.

Q1 State the location of yellow spot.

Q2 Name the pigments present in rods and cone cells.

Q3 What is the 'blind spot' of the eye?

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3 minutes break is over children. I hope you have finished writing the answers. Listen to the correct answers now-

A1 Yellow spot lies at the back of the eye almost at the centre on the horizontal axis of the eyeball

A2 Rod cells contain a pigment called Rhodopsin
Cone cells contain a pigment called Iodopsin

A3 Blind spot is the region in the eye which does not have any sensory cells, hence no image is formed here.

Children now let us continue with the topic and learn about the eye lens.

Eye lens is transparent, flexible, biconvex, crystalline body located immediately behind the pupil. It contains transparent lens fibres or thin long cells. Eye lens is held in position by fibres collectively called the suspensory ligaments. Suspensory ligaments attach the eye lens to the cilliary body. Thus the function of suspensory ligaments is to hold the eye lens and function of ciliary body is to change the shape of the eye lens for viewing objects at different distances. Eye lens divides the inner cavity of the eyeball into two chambers.- Aqueous and Vitreous chambers.

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(i) Aqueous chamber is the front chamber present between the cornea and the lens and is filled with clear watery fluid called aqueous humour

Aqueous humour serves two functions -

1. Aqueous humour keeps the eye lens moist and protects it from any injury or physical shocks.
2. It refracts the rays of light entering the eye

(ii) Vitreous chamber is the larger cavity of the eyeball behind the lens and is filled with a jelly like thicker fluid vitreous humour.

Vitreous humour serves two functions -

1. Vitreous humour helps in maintaining the shape of the eyeball
2. It protects the Retina and its nerve endings.

Students, this finishes with the structure of eye. 'Functioning of eye' we will discuss in next class All of you are required to read the chapter again from the text book and answer the following home assignment questions in the notebook -

Home assignment questions are as follows -

Q1 State the functions of aqueous humour and vitreous humour.

Q2 State the functions of - Ciliary body, suspensory ligaments, iris and pupil.

Q3 Draw a well labelled diagram of Human eye in the notebook.

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