

12.1 – The Human Eye

The human eye is an _____ (produces an image).

Each of the following parts of the eye contribute in some way to your sight:

1. **Cornea:** _____

2. **Iris:** _____

3. **Ciliary muscles:** _____

4. **Pupil:** _____

5. **Lens:** _____

6. **Sclera:** _____

7. **Choroid:** _____

8. **Aqueous humour:** _____

9. Vitreous humour: _____

10. Retina: _____

11. Optic Nerve: _____

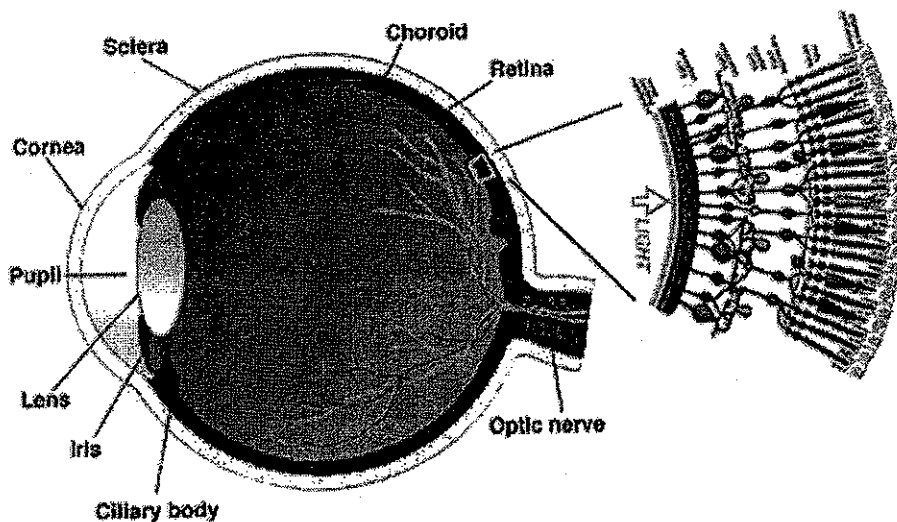


Fig. 1.1. A drawing of a section through the human eye with a schematic enlargement of the retina.

The Retina: Producing an Image

The retina contains two types of receptors: _____

The rods detect dim light and allow us to see _____
and white (shades).

The cones detect bright light and allow us to see _____

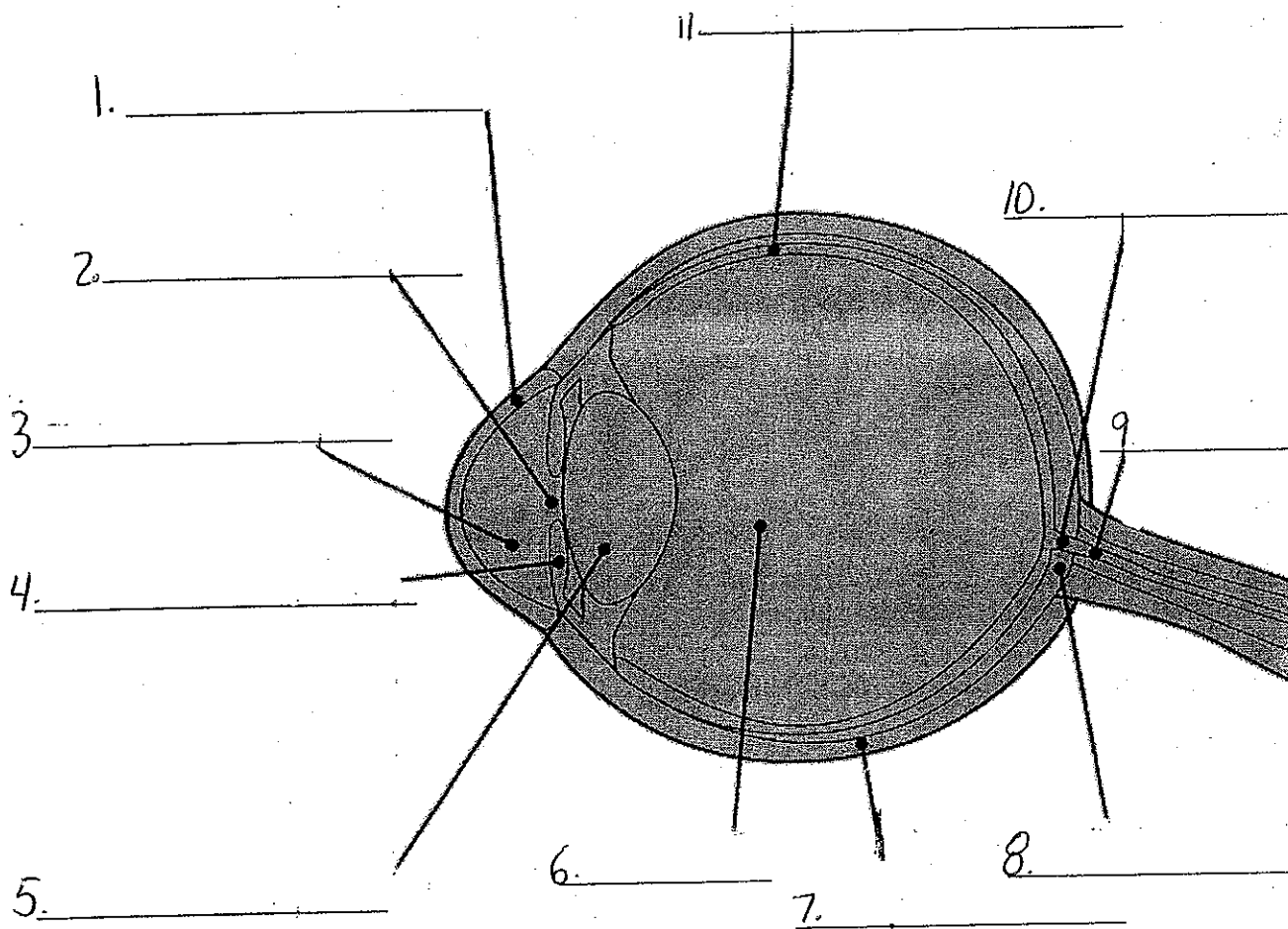
The rods and cones transform light energy into an
_____ nerve impulse which is sent to the brain
via the optic nerve. The _____ of the object is real
and inverted (upside down). Your brain interprets the
_____ it receives from your eyes as upright.

Assignment:

- 1a) What stimulates the sensory receptors of the eye?
- 1b) Where are these receptors found?
2. Where does refraction occur in the human eye?
3. Name the parts of the eye that are responsible for:
 - a. Gathering light
 - b. Controlling the amount of light
 - c. Focusing the light
 - d. Producing an image
4. Label the diagram attached

THE EYEBALL

Label the following parts of the eye:

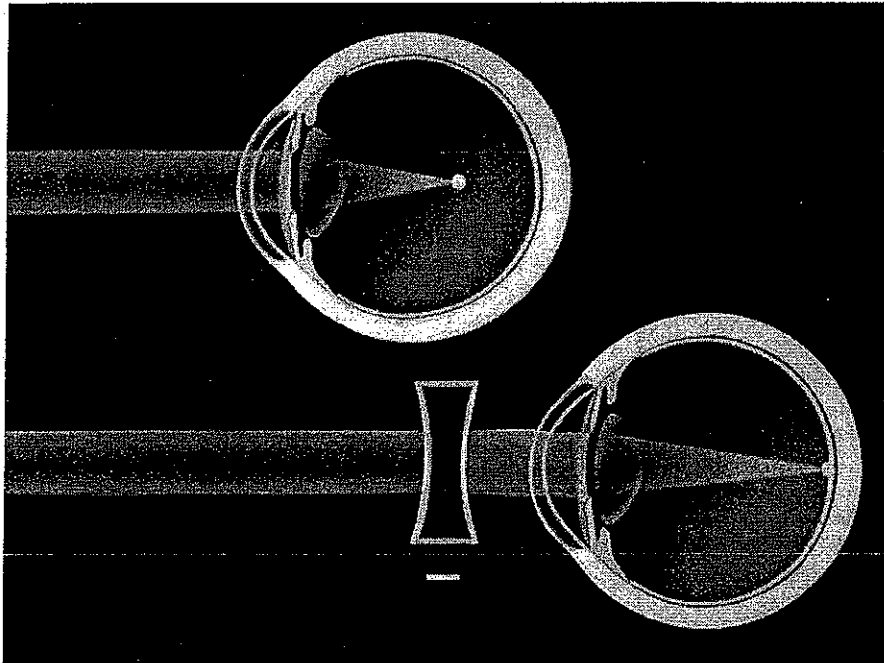


12.2 – Vision and Vision Problems

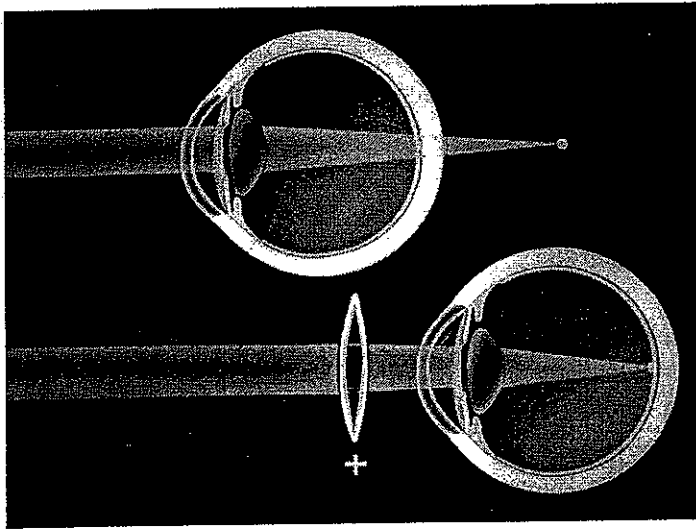
A person with _____ vision is said to have _____ Vision. This means that they can see items on an eye chart from _____ feet away, which are supposed to be seen at _____ feet away. If a person is _____, this means that they can see items on an eye chart from _____ feet away, which are supposed to be seen at _____ feet away. Therefore, they would have _____ than normal vision.

Common Vision Defects

_____ (nearsighted): a person can focus on close objects, but cannot clearly see objects far away. In this case the eyeball is _____, and therefore focuses the image in front of the retina. _____ lenses push the image back on to the retina.

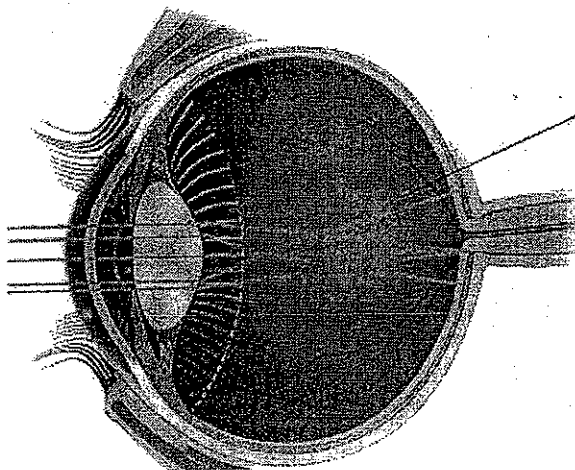


_____ (farsighted): a person can focus clearly on objects far away, but has difficulty seeing objects close up. In this case the eyeball is _____, and therefore focuses the image behind the retina. _____ lenses refract the light more, moving the image on to the retina.



_____ is when the cornea is _____ shaped, and therefore the light does not focus on the retina.

ASTIGMATISM



Astigmatism causes light to strike at more than one area at the back of the eye. This causes a distorted image.

_____ is an _____ condition where the eye naturally deteriorates. The muscles weaken and the lens loses some of its elasticity.

_____ is a permanent solution to vision problems. Laser surgery _____ the _____ to adjust the focal point on to the retina

12.4 Colour Vision

Seeing in Colour

_____ is the process of adding colours of light together to produce other colours.

In our retina there are three different types of cones:

1. sensitive to _____
2. sensitive to _____
3. sensitive to _____

All three of these colours are called _____ light colours.

Our eyes _____ signals of all three cones to see all the other colours. When light contains _____ colours, we see this as _____.

When light that contains red and green light, we see this as yellow. When light that contains only blue light enters, it stimulates only the blue cones, and we see this as blue.

_____ colours (magenta, yellow and cyan) are the colours we see when any _____ colours are combined. For example, when _____ and _____ light colours overlap, we see the colour _____. See figure 2 on page 354 of the text.

_____ light colours are when _____
light is produced from overlapping _____
and _____ light colours. For example,
_____ and _____ are complementary
colours. Cyan is created by mixing green and blue, and
therefore when red is added, the colour appears white. See
figure 2 on page 354 of the text.

_____ colours can be observed by staring
at a coloured object for a _____. If
you then look at a white surface, the tired cones do not
react, and you in turn see the complementary colour. For
example, if you were to stare at a red object for a long time
and then were to stare at a white surface, you would see
cyan.

Colour _____ occurs when people are
_____ to _____ certain shades
of colours. This is due to the cones at the back of our eyes
not responding to the light received. A person with red-
green blindness may have difficulty distinguishing
something red against a green background.