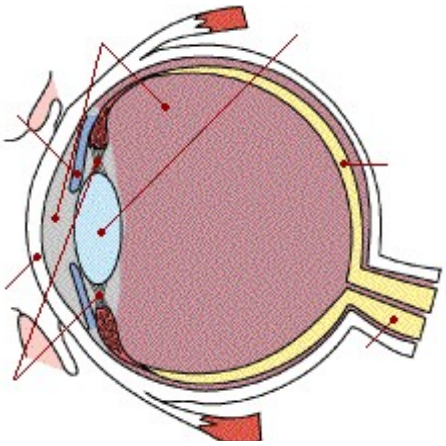
Name: _____

The Eye
SNC2D

The Anatomy of the Eye



Light entering the eye first meets the _____, a thin protective membrane (refractive index 1.38); it passes through fluid to the _____ (1.44), the shape of which can be adjusted by the _____.

The amount of light entering the eye can be controlled by the _____ (the coloured part of the eye) which can _____ to admit more light.

The black part of the eye, or the _____, is _____ a proper anatomical part of the eye. It is just the opening for the light and appears black because _____ _____.

At the back of the eye is the _____, the "screen" on which images are formed. Its _____ and _____ detect the intensity and frequency of light and send the information to the brain via the _____.

Rods are _____ and dark changes, shape, and movement but contain only one type of light-sensitive pigment and are therefore not good for color vision. Rods are more numerous than cones in the _____ of the retina.

Cones are _____ (green, red or blue). Signals from the cones are sent to the brain which then translates these messages into the perception of colour. Cones, however, are not as sensitive to light as rods. That's why you cannot see colour very well _____.

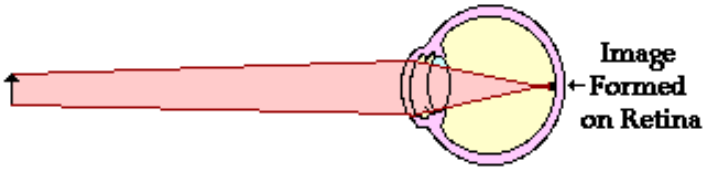
Someone who is _____ does not have a particular type of cone in the retina or one type of cone may be weak. In the general population, _____ _____.

Note that because the optic nerve runs through the retina, there is a _____ on the retina, also called the _____. Light that falls on this area will not be detected.

To find your blind spot, look at the following image on a piece of paper (copy onto a blank sheet of paper for the best results:

Close your left eye. Hold the image about 20 inches away. With your right eye, look at the dot. Slowly bring the image closer while looking at the dot. At a certain distance, the + will disappear from sight . . . this is when the + falls on the blind spot of your retina.
Repeat for the other eye, looking at the + instead.

Image Formation



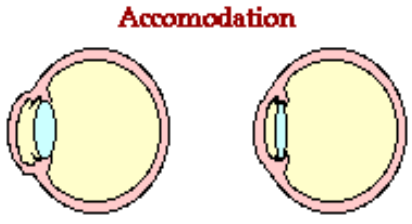
The cornea and lens serve to refract light and focus an image of the object upon the retinal surface.

Most refraction actually occurs in the _____ because the index of refraction of the cornea is significantly different than the index of refraction of _____. The changing-shape lens _____ the refraction. Together, both act as a converging lens with a focal length of approximately _____.

Note that the image formed on the retina will be _____, _____, and _____.

It is the _____ that is responsible for re-inverting the image when it is interpreted.

However, since the image distance, d_i, is fixed, the focal length, f, must change to focus objects at different distances, d_o. The focal length is changed by the ciliary muscles changing the shape of the lens.



The power of a lens is measured by opticians in _____.

The power is equal to the reciprocal of the focal length of the length measured in metres:

Power =

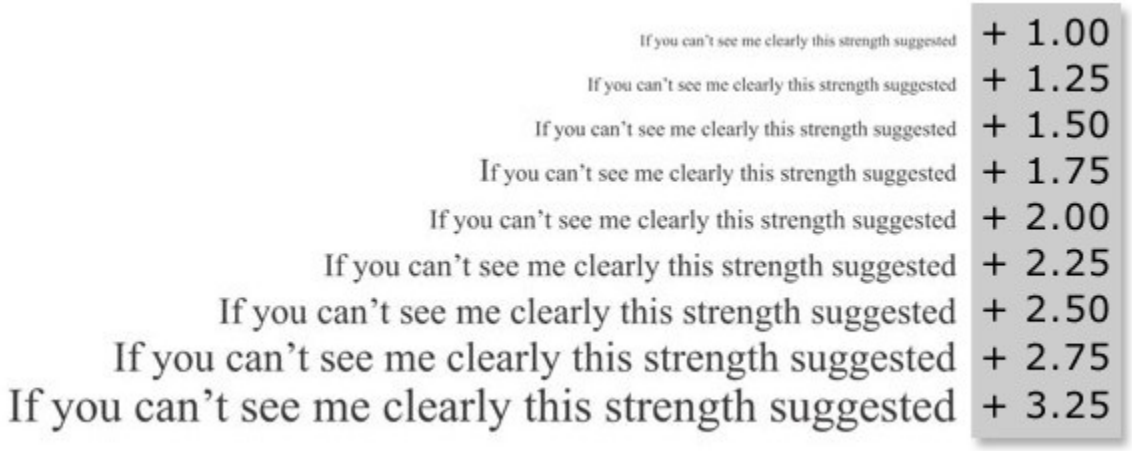
E.g. to image a very distant object, the eye would need to have a focal length of 1.7 cm, or 0.017 m:

But to image an object 0.25 m distant, the eye would need to have a focal length of:

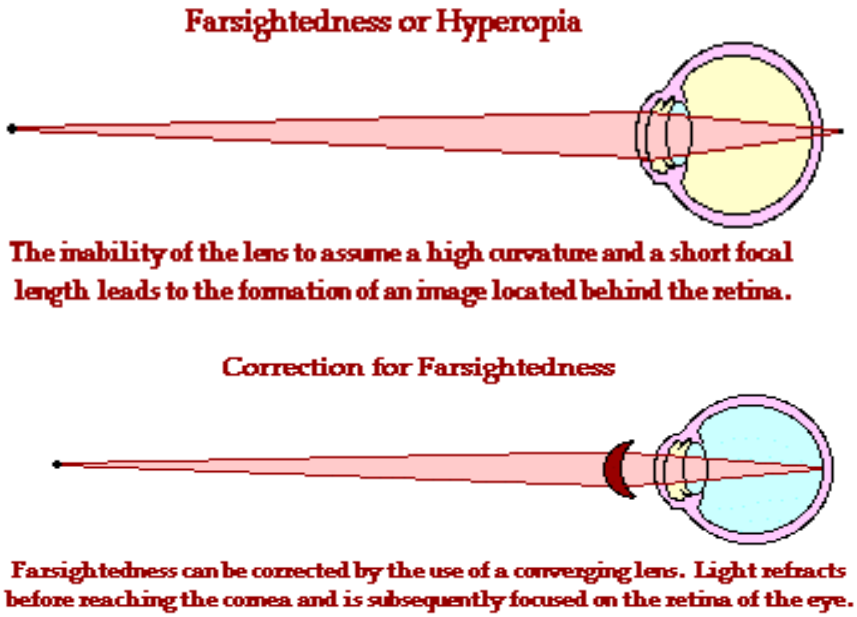
The maximum variation in the power of the eye is called the _____.

E.g. 63 diopters – 59 diopters = 4 diopters, which is typical for young, healthy eyes.

Power of accommodation _____ with age.



The inability of an eye to focus on near objects (usually because of either a failure of the ciliary muscles or decreased flexibility of the lens) is called _____ or **hyperopia.** It can be corrected by the use of a _____ lens.



The inability of an eye to focus on far objects (usually because of an elongated eyeball) is called _____ or _____**.** It can be corrected for by the use of a _____ lens.