uction: when any sensory energy (eg. light energy) is converted nto neural energy/impulses.

Vavelength determines color. It is the length of one full wave of light Visible light has wavelengths from 4.0 imes 10 $^{\circ}$ m to 8.0imes 10 7 m.

mplitude determines intensity (brightness)

The Eye Light enters the eye and travels through the following structures: Cornea - protective layer

Pupil - an adjustable opening controlled by the colored Tris

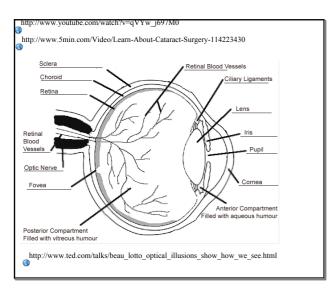
uscle around the pupil). Lens - an oval transparent disc that changes shape to focus light b

process called Accommodation Light is then focused onto theeting Retina - this is the light sensitive inner surface of the eye

itaining thereceptor cells called rods and cones

Optic Nerve - axons form the optic nerve and take information to e brain (occipital lobe/visual cortex)

Oct 16-2:17 PM



Oct 16-2:36 PM

The Retina has 2 types of receptor cells:

- 1. Rods: these detect brightness of light and allow us to see in black and white. They are more light sensitive than cones and enable us to see in darker areas. There are approximately 120 million rods and they are situated along the periphery of the retina.
- 2. Cones: these detect color and detail and function best in well-lit areas. Many have their own bipolar cell that allows them to relay individual information to the cortex thereby allowing cones to detect fine detail. There are approximately 6 million cones and they are clustered at the center of the retina <u>around</u> the fovea (the area of central focus).

Once light energy strikes the rods and cones, chemical changes produce neural signals that activate bipolar cells in turn activating ganglion cells. The axons of these form the Optic Nerve that will then carry information to the brain.

Everyone has a **Blind Spot**, a small region in the visual field where nothing could be seen. This is because there are no receptor cells where the optic nerve leaves the eye in the retina.

There are 3 basic types of Acuity or how sharp or clear vision is: normal vision, nearsightedness (only see near things clearly), and farsightedness (only see far things clearly).

People can still remarkably locate objects but are not consciously aware of how they did it. Such a phenomenon is called Blind Sight.

Find your blind spot..

Oct 16-2:37 PM

Color Vision

Color processing is described in 2 stages:

- 1. Young-Helmholtz trichromatic (three-color) theory: Light is detected by three types of cones each specifically sensitive to Red, Blue, or Green. Combinations of these colors produce intermediate colors (yellow, purple, etc.).
- 2. Opponent-Process theory Color is then processed by their opponent colors (red-green, blue-yellow, black-white). That is, some cells are excited by blue and inhibited by yellow, vice versa. Thus, you cannot see a bluish-yellow.

Color constancy refers to the importance of the surrounding background effects on perceived color. Color constancy states that colors do not look different even in different illumination (i.e. sunlight versus a dark room). Green grass will still be green whether on a clear or cloudy day.

Oct 16-2:38 PM