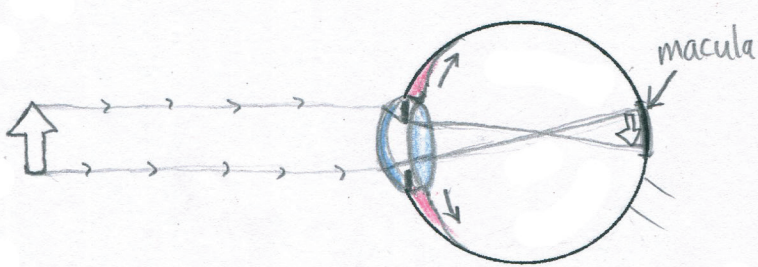


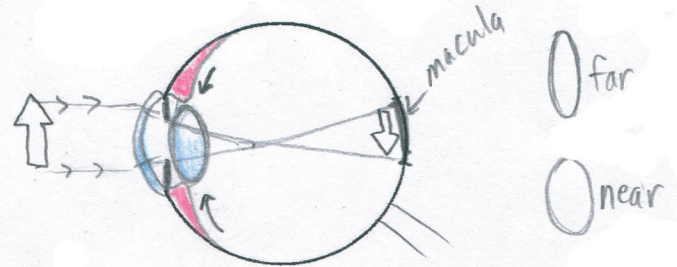
THE EYE (physiology)

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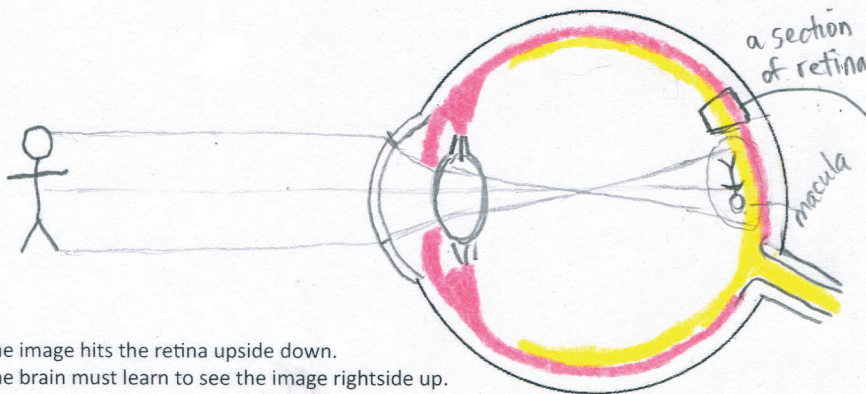
How does the eye focus? The ciliary body controls the shape of the lens.



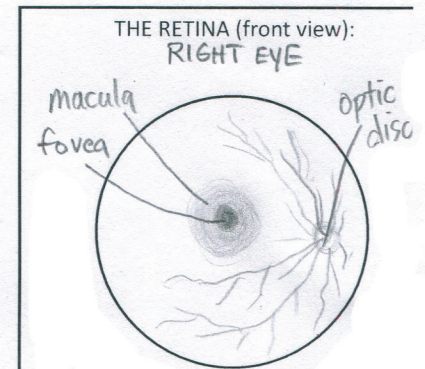
To focus on distant objects, the ciliary body relaxes, causing the zonules to tighten, making the lens become more flat.



To focus on objects that are close, the ciliary body tightens, causing the lens to become more round.



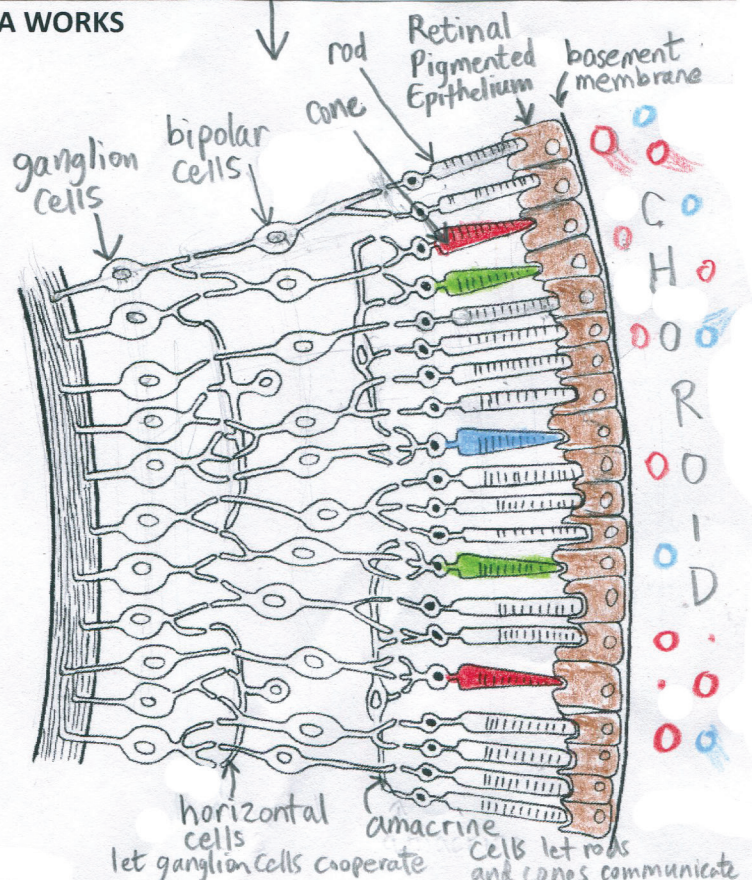
The image hits the retina upside down.
The brain must learn to see the image rightside up.



HOW THE RETINA WORKS

Rods and cones are backwards from other receptor cells. They are turned on all the time, constantly releasing neurotransmitters. Light actually turns **off** rods and cones, and prevents them from being active. It is when they stop "firing" that a signal is sent to the bipolar cells.

The mechanism that starts the turning-off process is a pigment molecule called **rhodopsin**. Rhodopsin is found in the phospholipid membranes in the "pancakes" (discs) in the ends of the rods and cones. It holds a smaller molecule called **retinal**. When light hits retinal, its shape changes and this starts a chemical cascade that results in sodium ions rushing into the cell. The influx of sodium stops the cell from releasing its inhibitory neuro-transmitters. The bipolar cells are then activated.



RODS: Cannot sense color, only light/dark. Function in low light conditions.

CONES: Sense one of these: red, green blue. Need lots of light to function.

The fovea has about 150,000 cones per mm². Other parts of the retina might have 10,000 or fewer cones per mm².

