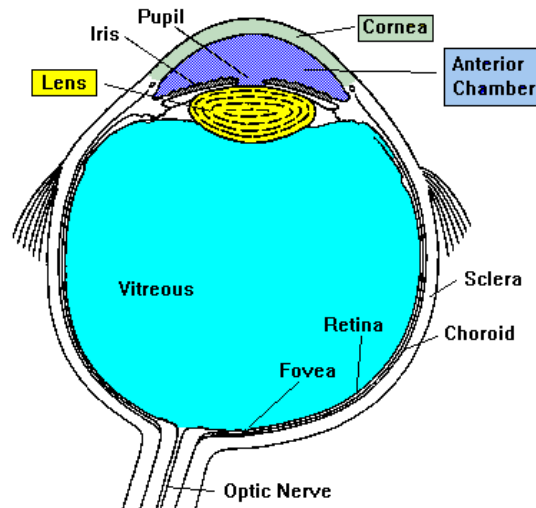


# Our Senses

## How we perceive our world

### Sight



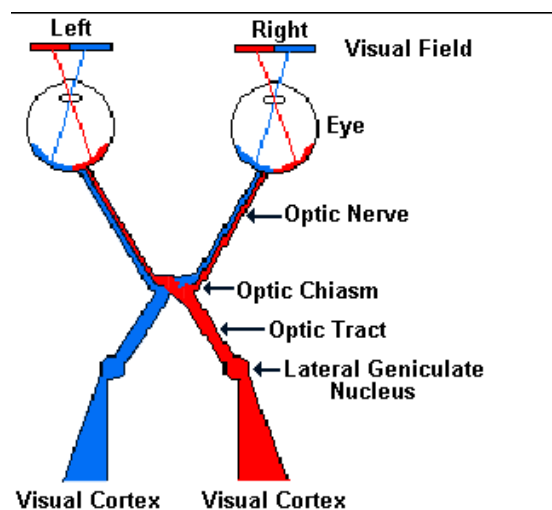
Rods function in dim light

Cones function in bright light

Cones are spread throughout the retina but are especially concentrated in a central area called the fovea, where only cones (no rods) are found.

Different areas of the visual cortex have different functions:

Identification of colour, shape and movement!

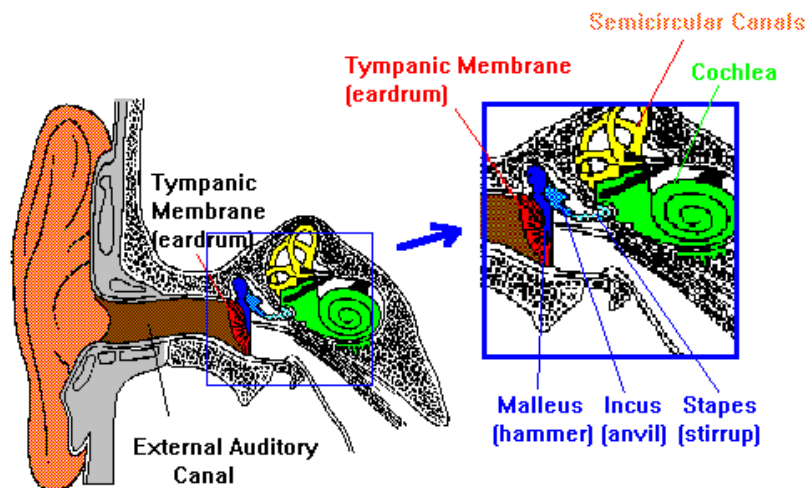


To demonstrate the blind spot, look at the image below or draw it on a piece of paper:



Close your left eye. Hold the image about 20 inches away. With your right eye, look at the dot. Slowly bring the image (or move your head) 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. Reverse the process. Close your right eye and look at the + with your left eye. Move the image slowly closer to you and the dot should disappear.

## Hearing



The three bones in the ear (malleus, incus, stapes) pass these vibrations on to the cochlea.

The cochlea is a snail-shaped, fluid-filled structure in the inner ear which causes an action potential in the cochlear nerve.

The cochlear nerve projects to the primary auditory cortex

## Touch

The epidermis is the outside layer of your skin. The dermis is the inside layer of skin. The skin is ~3-4 kg and 20 square feet!

Nerve fibres that are attached to different types of skin receptors either continue to discharge during a stimulus ("slowly-adapting") or respond only when the stimulus starts and sometimes when a stimulus ends ("rapidly-adapting").

## **Smell**

The sense of smell, called olfaction, involves the detection and perception of chemicals floating in the air.

Olfactory cells form the olfactory tract which transmits the signals to the brain to areas such as the olfactory cortex, hippocampus, amygdala, and hypothalamus.

People can distinguish between 3,000 and 10,000 different odours.

Some people have NO sense of smell. This disorder is called anosmia.

## **Taste**

The sense of taste is also called gustation.

There are four basic tastes: sweet, salty, sour and bitter.

The actual organ of taste is called the "taste bud." Each taste bud (and there are approximately 10,000 taste buds in humans) is made up of many (between 50-150) receptor cells. Receptor cells live for only 1 to 2 weeks and then are replaced by new cells.

## **6<sup>th</sup> sense??? - Proprioception**

The knowledge of where our bodies and limbs are in space

## **Amazing animal senses**

Bats can find food (insects) up to 18 ft. away and get information about the type of insect using echolocation.

The eyes of the chameleon can move independently. Therefore, it can see in two different directions at the same time.

Crabs have hair on claws and other parts of the body to detect water current and vibration.

Like bats, dolphins use echolocation for movement and locating objects.

Each eye of the dragonfly contains 30,000 lenses.

The entire body of an earthworm is covered with chemoreceptors.

Blowflies taste with 3,000 sensory hairs on their feet.

The frog has an eardrum (tympanic membrane) on the outside of the body behind the eye.

The giant squid eye is 40 cm in diameter.

The silkworm moth can detect pheromones up to 11 km. away.

Scorpions can have as many as 12 eyes.

Make sense of this table by drawing a line to connect "matching" pictures and words in each column.



Nose

Sight

Gustation



Eye

Touch

Audition



Skin

Hearing

Olfaction



Tongue

Smell

Vision



Ear

Taste

Somatic Sensation