SCI 113 - ANATOMY AND PHYSIOLOGY

SPECIAL SENSES

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SCI 113

ANAPHY

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Hello

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SPECIAL SENSES

There are five basic human senses: touch, sight, hearing, smell and taste. The sensing organs associated with each sense send information to the brain to help us understand and perceive the world around us.

Humans have five senses: vision, hearing, touch, smell, and taste. All of these senses are important in our daily lives. It would be a pity if we were unable to taste and smell the birthday cake that our families have prepared for us, to hear conversations or listen to music, to see the world around us, or to feel the hug of a friend.

SPECIAL SENSES

THE FIVE SENSES

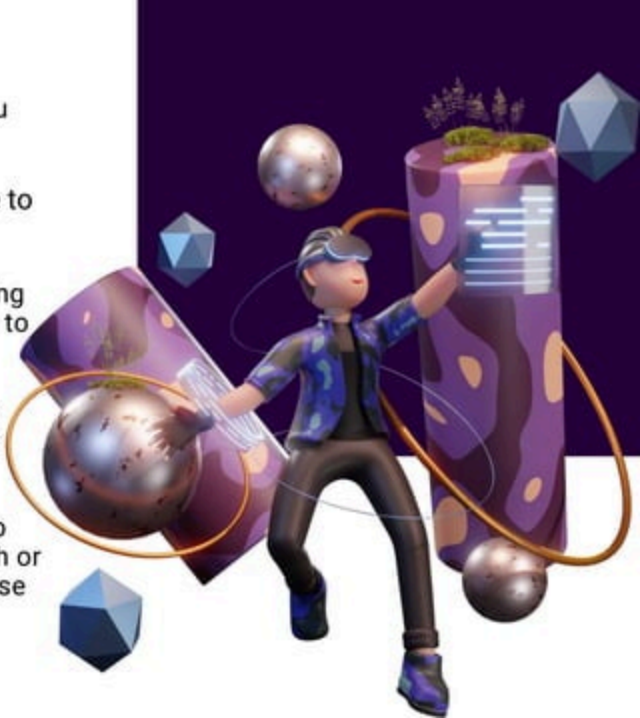
1. Sight: Eyes obviously allow us to see. But if you break it down, they do more than just that.

2. Sound: : hair cells in the ear move in response to specific frequencies of sound.

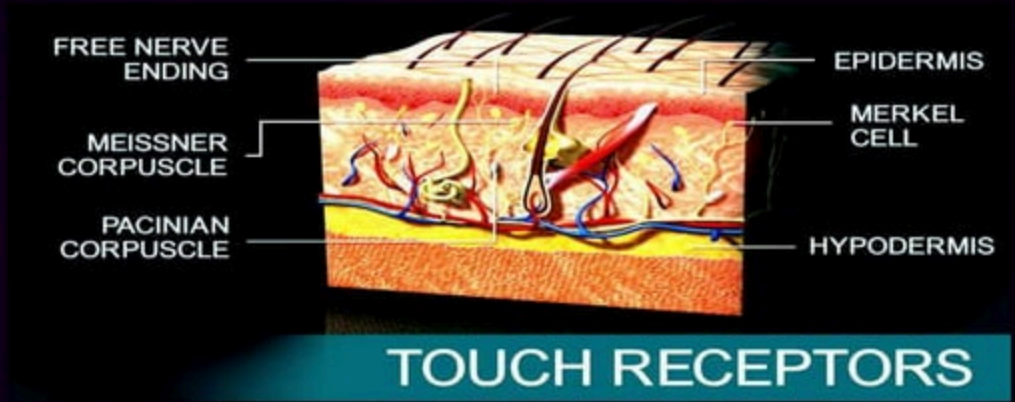
3. Taste: Tongues are used to taste foods, allowing us to figure out if something is going to be useful to our bodies or poisonous.

4. Smell: Smell begins at the back of nose, where millions of sensory neurons lie in a strip of tissue called the olfactory epithelium.

5. Touch: Using your sense of touch allows you to tell if something is hot or cold, dull or sharp, rough or smooth, wet or dry. Skin is packed with many sense receptors.



SPECIALIZED RECEPTORS IN THE SKIN SEND TOUCH SIGNALS TO THE BRAIN

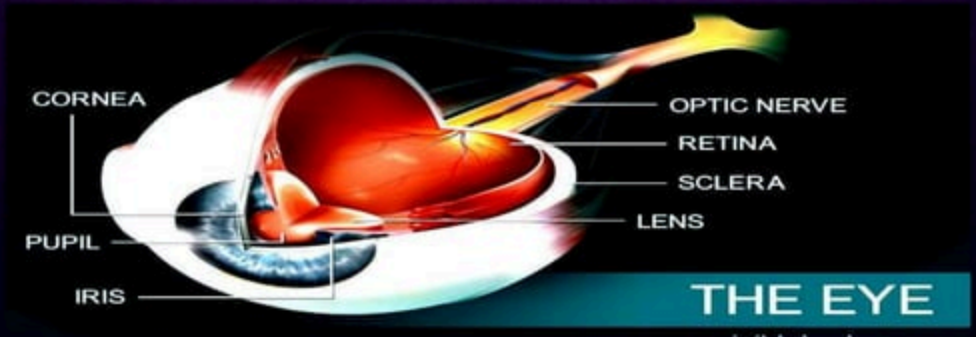


Specialized Receptors in the Skin Send Touch Signals to the Brain

Skin consists of three major tissue layers: the outer epidermis, middle dermis, and inner hypodermis.Specialized receptor cells within these layers detect tactile sensations and relay signals through peripheral nerves toward the brain. The presence and location of the different types of receptors make certain body parts more sensitive. Merkel cells, for example, are found in the lower epidermis of lips, hands, and external genitalia

Meissner corpuscles are found in the upper dermis of hairless skin — fingertips, nipples, the soles of the feet. Both of these receptors detect touch, pressure, and vibration. Other touch receptors include Pacinian corpuscles, which also register pressure and vibration, and the free endings of specialized nerves that feel pain, itch, and tickles.

THE EYES TRANSLATE LIGHT INTO IMAGE SIGNALS FOR THE BRAIN TO PROCESS.



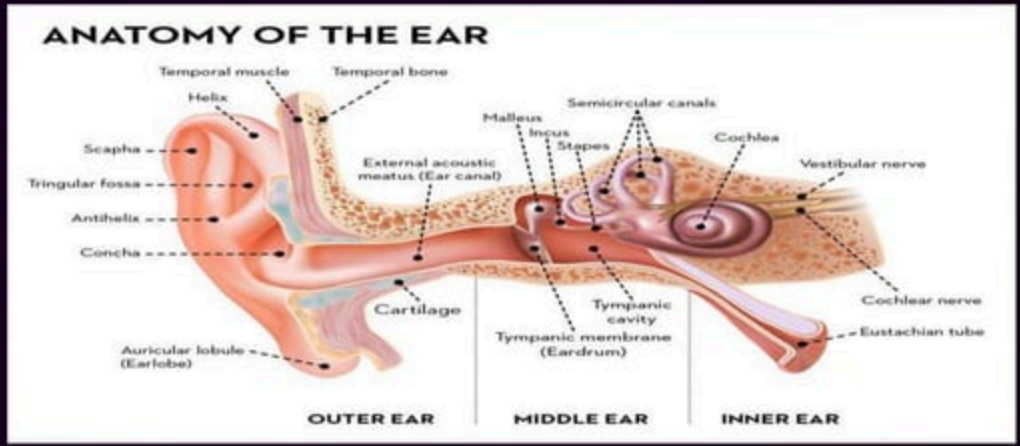
The Eyes Translate Light into Image Signals for the Brain to Process

The iris dilates or constricts, adjusting how much light passes through the pupil and onto the lens. Your capacity to see stems from complex teamwork between your eyes and brain. The vision process starts when light rays from the objects you see pass through the cornea, the clear, dome-like structure covering your eyes. These light rays will then enter a black opening called the pupil.

The size of your pupil is controlled by the iris, the colorful part of your eyes. It allows your pupil to dilate when you're in a dim place so maximum light is admitted. When you're in a bright place, it constricts your pupils to avoid overwhelming your eyes with light. Afterward, the light rays are bent toward your lenses.

- Step 1: Light enters the eye through the cornea
- Step 2: The pupil adjusts in response to the light
- Step 3: The lens focuses the light onto the retina
- Step 4: The light is focused onto the retina
- Step 5: The optic nerve transmits visual information to the brain

THE EAR USES BONES AND FLUID TO TRANSFORM SOUND WAVES INTO SOUND SIGNALS

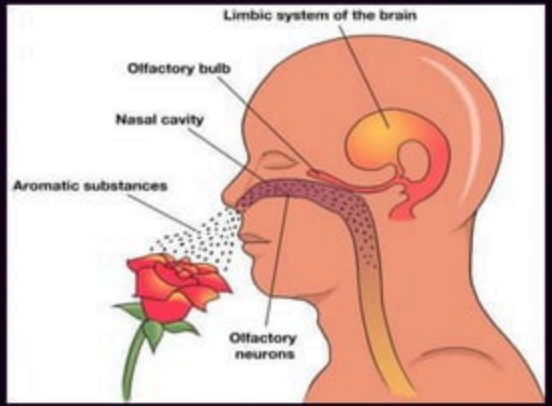


The Ear Uses Bones and Fluid to Transform Sound Waves into Sound Signals

Music, laughter, car honks — all reach the ears as sound waves in the air. The outer ear funnels the waves down the ear canal (the external acoustic meatus) to the tympanic membrane (the "ear drum"). The sound waves beat against the tympanic membrane, creating mechanical vibrations in the membrane. The tympanic membrane transfers these vibrations to three small bones, known as auditory ossicles, found in the air-filled cavity of the middle ear.

Step 1: Sound waves enter the ear.
Step 2: Sound moves through the middle ear
Step 3: Sound moves through the inner ear (the cochlea)
Step 4: Your brain interprets the signal.

OLFACTION: CHEMICALS IN THE AIR STIMULATE SIGNALS THE BRAIN INTERPRETS AS SMELLS



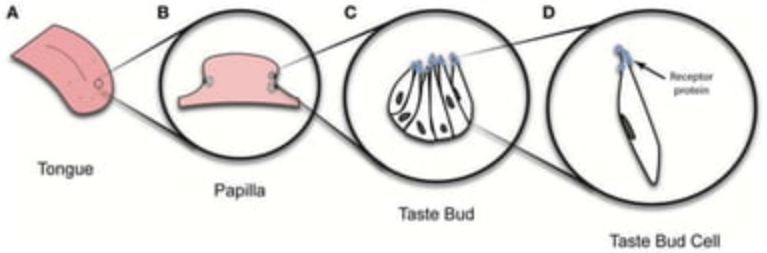
The sense of smell is called olfaction. It starts with specialized nerve receptors located on hairlike cilia in the epithelium at the top of the nasal cavity. When we sniff or inhale through the nose, some chemicals in the air bind to these receptors. That triggers a signal that travels up a nerve fiber, through the epithelium and the skull bone above, to the olfactory bulbs.

The olfactory bulbs contain neuron cell bodies that transmit information along the cranial nerves, which are extensions of the olfactory bulbs. They send the signal down the olfactory nerves, toward the olfactory area of the cerebral cortex

HOME OF THE TASTE BUDS: THE TONGUE IS THE PRINCIPAL ORGAN OF GUSTATION

Home of the Taste Buds: The Tongue Is the Principal Organ of Gustation

When we eat, chemicals from food enter the papillae and reach the taste buds. These chemicals (or tastants) stimulate specialized gustatory cells inside the taste buds, activating nervous receptors. The receptors send signals to fibers of the facial, glossopharyngeal, and vagus nerves. Those nerves carry the signals to the medulla oblongata, which relays them to the thalamus and cerebral cortex of the brain



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THANK YOU!!!

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