A Lesson on the Senses

Student Teachers: Olivia, Chris, Michael

Teaching Plan ~ Agenda

1. Discussion ~ 10 min
2. Activity ~ 35 min
3. Wrap-up ~ 5 min

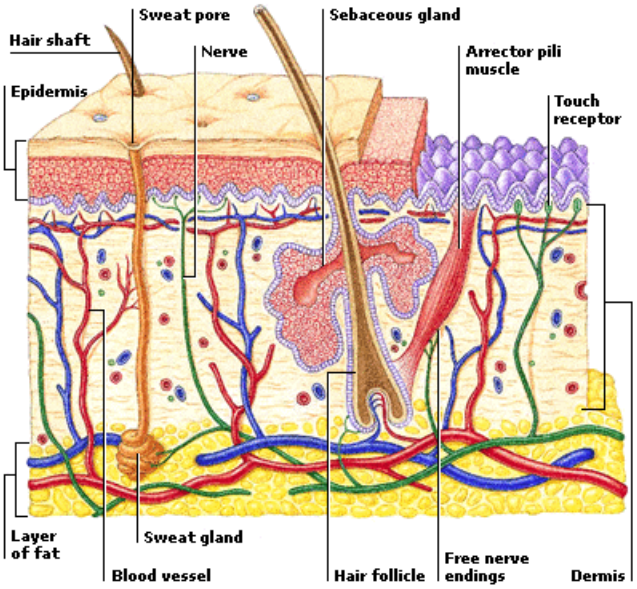
Total: 50 min

This lesson is an introduction to the human sense organs, which will let students know how the human body responds and reacts to certain noises, feelings, foods, and sights. It is an interactive lesson that will engage the active, sensing, and visual learning types, but it will draw in the others with thoughtful discussion and logical procedure.

Background

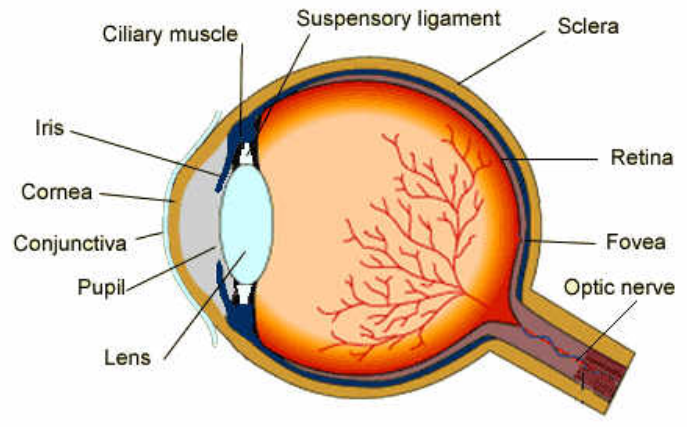
A valuable skill in scientists is not only active thought and mindset, but the ability to observe and describe in sensory detail. The human body is very aware and perceptive, biologically. Here is some information on the five different senses:

- Touch - Throughout the body are nerve endings, and the more nerve endings, the more touch-sensitive a person is. The four kinds of sensations are cold, heat, contact, and pain. Fingertips have one of the most sensitive concentration of nerve endings.

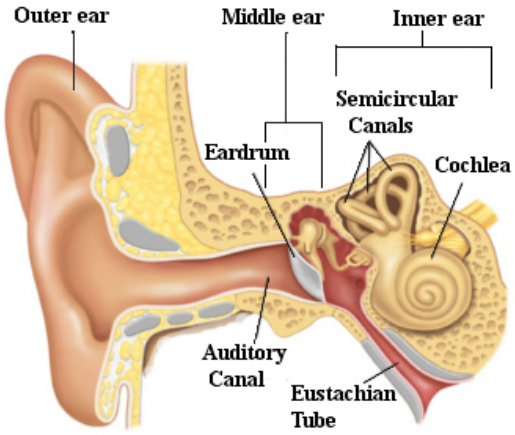


- Sight - The human eye is a complex organ that has a lens that focuses light into the back, the retina. It has sensitive rods and cones that help distinguish color. The eye sends image to the back of the brain, which interprets the upside-down vision or picture

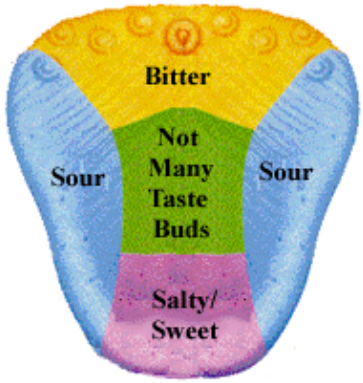
as right-side up.



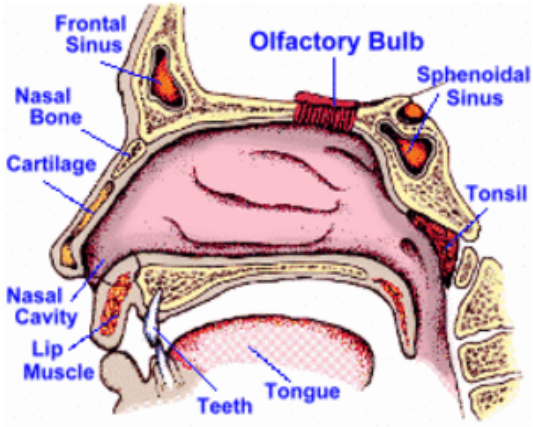
- Hearing - The ear consists of the outer, middle, and inner part. The outer ear is cupped to direct sound into the tympanic membrane, which transmits vibrations to three small bones in the middle ear: malleus, incus, and stapes. The inner ear, the cochlea, has a bunch of nerve fibers that react to the vibrations and sends nerve impulses to the brain.



- Taste - Taste buds, located on the tongue and roof of the mouth, are responsible for this sense. They can detect salty, sweet, bitter, and sour. The taste buds are geographically mapped on the tongue, and the number of taste buds varies within each person.



- Smell - The nose helps the sense of smell. Inside the nostril, the nose has several receptors connected to the olfactory nerve. When vapors of substances brush by them, the receptors react with the vapor molecules and sends these sensations to the brain. There are seven types of smell sensations: camphor, musk, flower, mint, ether, acrid, or putrid.



- Other senses - Kinesthesia is the the awareness of muscle and joint movement that allows for better coordination. When a child feels itchy, he knows what area to scratch because of kinesthesia.

For the Mentees

When something is cold, how do we know? When food is tasty, how do you describe it? These five senses are valuable measures of perception. People have different levels of perception among each other, and among animals as well. How do others adapt to keener senses? Asking these open-ended questions are especially important in involving everyone in discussion, and the idea is relateable to everyone.

Demonstrations

This will be a five step activity, around seven minutes per step for the full 35 minutes.

1. Touch - Diaper Activity
    - Wet/Dry - Students will first test their fingers in a cup of water and analyze what they feel. Afterward, move onto diapers by first creating an narrow incision along the inner core of the diaper. Retrieve the remnants of powdery strands from the inner core and seal it into a plastic bag. Repeatedly pulverize bag with your fist until you procure a powdery product. Next, retrieve two test bottles and insert the powdery substance in one of the test bottles. Then pour 10 mL of water in each container. As you will see, a jello substance will form from the powdery mixture. Let the students feel and analyze the gelatin substance.
2. Sight

    - Beer Goggles- Students will be able to when you wear them, your field of vision is rotated 45 degrees. Students will then try to perform a simple task such as drawing a square or a triangle and will record their observations.

  If unable to find beer goggles, proceed with the following activities:

    - Optical Illusions - Obtain several pictures of optical illusions and ask how students perceive each drawing - reactions, ideas. Ask them what they see first.

3. Hearing
    - Music - Bring in an iPod, small instrument, or radio with different genres of music/ sounds. Each iPod device needs to download the same file that has multiple sounds. For example the file can be a sound file of traffic with alarms and people talking in the background. Ask students what sounds did they identify. Students can take turns playing the small instrument, going up the scale.
    - If time permits students can engage in conducting a doppler effect experiment. One student should stay still while another student holds the electronic sound emitting device and walk towards the student. Both students take turns and observe the change in sound.
4. Taste
    - Tongue Mapping - Have pieces of candy or snacks (salty pretzels, sweet chocolate, sour punch belts) and ask whether each part of the tongue can register salty, sweet, and sour better. Refer back to tongue diagram on page 3.
5. Smell
    - Apple or Potato - Have pieces of cut apples and potatoes, ask the students to close their eyes and pinch their nose as they bit into these two foods. Ask them to try it when their noses are unblocked as well.
    - Note: If the entire activity is time restricting, incorporate smell into taste activity.

Closing Activity and Discussion

Students should be able to discuss as they go along, but engage them with questions regarding each sense, and how it relates back to the whole picture. Smell and taste work together to distinguish foods. Hearing key notes are especially important in dialects and establishing emotions. Visualizing different images is a gateway to our inner thoughts and perceptions. Engineers need the senses in order to make and specify observations. It is also important to understand and predict trends.

Worksheet
- See attached

Materials
- Diapers (10------1 for each pair of students)
- Water
- Beer Goggles (~20-------1 for each student)
- Printouts of Optical Ilusions (10--------Only if unable to get Beer Goggles)
- iPod/speakers (With each one with the same downloaded file for analysis)

- Small Instrument
- Pretzels
- Chocolate Candy
- Sour Punch Belts
- Sliced Apples
- Sliced Potatoes

References

Zamora, Antonio. “Anatomy and Structure of Human Sense Organs.” *Scientific Psychic.* 2006. Web Accessed 8 Apr. 2011. <http://www.scientificpsychic.com/workbook/chapter2.htm>

Name: _____

Date: _____

Instructions: For each activity write down your observations pertaining to that sense.

A Lesson on the Senses

touch

sight

taste

smell

hearing