



Come to Your Senses

Curriculum Unit 09.04.06
by Darla Martinez

Introduction

I am a kindergarten teacher at Vincent E. Mauro Inter-district Magnet School in New Haven, Connecticut. Vincent Mauro is an elementary school for Science, Math and Technology. Vincent E. Mauro Magnet school is located in an urban neighborhood and is composed of a multicultural community of students. The student's backgrounds vary from low economic families to middle class families. The variety of different backgrounds, interests, needs and learning styles make our school very diverse. Students come from the surrounding neighborhood in New Haven and from surrounding suburban communities as well. The teacher's strive to provide students with the means to explore their unique interests and utilize different teaching practices to help students reach their goals.

This unit is designed to help students learn about their bodies and how they use their senses to take in information. I hope to generate interest and excitement by encouraging students to use their five senses to explore the world around them.

Objectives

This unit will give students the understanding that their five senses work together all the time in order to allow their body to function properly and explore their world. You touch, hear, see, taste, and smell in order to adapt to a new environment. Students will learn that the nerves in their nose, skin, tongue, eye, and ears take in all of the different information around them. They bring all the different sights, smells, feelings, sounds, and tastes together and send messages to the brain.. Your brain processes the information and interprets what you smell, see, feel, hear, or taste. This unit is intended to demonstrate through hands on activities that without the information we receive through our five senses we could not function as the beings we are and that each sense is important in its own right, but each has limitations. On the other hand, one heightened sense can be used to compensate for the loss of another. Another important aspect of learning about our senses is to become aware of physical handicaps that may cause difficulty for people who do not have access to these senses.

Strategies

This unit will use literature skills such as labeling, reading, connecting literature to science and self. It will also use math skills such as comparing and contrasting, graphing, analyzing, data collection, organization and presentation. As a pre and post-assessment, students will be tested on their ability to recognize and identify their five senses and the body part associated with each sense.

The concepts this unit covers are as follows: 1) Using the five senses to explore or learn about the world around us. Students will use their five senses and go on a sensory walk around our school. 2) Determining that objects have properties by using their five senses. Students will use their sense hearing, smelling and touch to discover the contents of sealed boxes. 3) Sorting and comparing objects by properties using our senses. Students will use their sense of touch to sort objects by texture. 4) Understanding that objects can be similar and different from each other. Students will use their sense of smell to tell the differences among clays that has different scents.

Classroom Activities

The classroom activities I will use to demonstrate the key concepts of this unit follow the core idea that some properties of objects can be determined using just your five senses.

The activities in this unit are meant to answer cumulative questions that guide instruction and assessment such as; What are the five senses? How can we use our five senses to help use learn about objects? How can we transfer what we learn about one object to make predictions about other things?

Background Information

What are senses? Senses are the physiological means of perception. Each being, human's or animal's nervous system has a different sensory system (organ), specific to each sense. A broadly acceptable definition of a sense is "a system that consists of a group of sensory cell types that responds to a specific physical phenomenon, and that corresponds to a particular group of regions within the brain where the signals are received and interpreted"(Wikipedia 2009, Sense).

Sight, hearing, touch, smell, and taste are usually defined as the five senses. Other senses such as; nociception (the sense of pain), equilibrioception (the sense of balance), proprioception and kinesthesia (the sense of joint motion and acceleration), thermoception (the sense of temperature differences), and magnetoception are additional categories.

Lesson 1: The Five Senses (Pre-Assessment)

Objective: The students will be introduced to the five senses and the brain's connection to them.

Materials: Book, My Five Senses (Aliko, 1962).

Pictures and diagrams of the ear, eye nose, tongue, hand (to show touch)

Chart paper and marker

Vocabulary: See, Eye, Hear, Ear, Taste, Tongue, Smell, Nose, Touch, Feel, Skin, Brain

Procedure: As an introduction to the five senses, I will first take my students on a five senses trip around our school. I will start the trip by telling my students that we will be walking around our school both inside and out (depending on weather conditions). I will be ask them to notice what they see (using their eyes), hear (using their ears), smell (using their nose) and feel (using their hands to touch). We will not taste at this time. During the walk I will ask them questions like: Do you smell, see, hear or feel anything? If you do, can you describe it? How do you know it's what you think it is? What parts of your body helped you?

After the walk, I will review their sensory experiences with the class. I will use chart paper to record what they observed on the walk. Ask them what they learned from our trip. What did you see, hear, feel, and smell? I will record their responses under headings for each sense.

To close the lesson, I will read the book My Five Senses by Aliko to the students. We would discuss the book. I will assign the following assignment for the writing center:

Students would complete the sentence frame, "I see ____ with my eyes, I hear with my ears, I feel _____ with my hands and I smell _____ with my nose."

Assessment: I will assess learning by asking the questions: 1. Why do we need our five senses? 2. What can we do with our senses? 3. What are the five senses and how to they help us learn? (Lesson adapted from Unit K Five Senses, 2009.)

Somatosensory system

The somatosensory system has receptors throughout the body, inside and out. Using these receptors for touch, temperature, proprioception (body position), and nociception (pain), the body can react to different stimuli. This information is sent to the primary somatosensory area of the cerebral cortex through the sensory nerves and tracts in the spinal cord.

There are two basic pathways in the spinal cord that carry different types of information from the body (except the head). Light touch, proprioception and vibratory sensations are carried in one part of the spinal cord. Pain and temperature information, on the other hand, is carried in another part. Somatosensory information about the face and head is carried by the trigeminal nerve, a highly specialized nerve that connects directly to the brain.

Sight

The ability of the eye and brain to detect electromagnetic waves within a visible range (light) is known as sight or vision. The eye's ability to perceive color (the frequency of photons of light) and brightness (amplitude / intensity - number of photons of light) are controlled by different cones in the eye (Wikipedia, 2009, Visual perception). Our eyesight or vision is the resulting perception.

Visual system

Humans are able to assimilate information through their visual system. In order for the eye to see, the lens of the eye needs to focus an image onto the retina, a light-sensitive membrane at the back of the eye. The retina's job is then to convert the patterns of light into neuronal signals. The photoreceptive cell in the retina detects photons of light and sends signals from the retina to the lateral geniculate nucleus in the thalamus or brainstem. In turn, this information is sent to the primary and secondary visual cortex of the brain (Wikipedia, 2009, Visual perception).

Lesson 2: Out of Sight

Objective: Students will learn about how the sense of sight orients them to their environment, allows them to interact with their surroundings and is important for everyday activities.

Materials: For the class: One large tree or cave pattern, One large animal pattern (ex. bear, squirrel or bird), Chart Paper

For each student: Blindfolds, Markers, Glue Sticks or Tape, Teacher made student journal (to record predictions and observations)

Procedure: To introduce the activity by giving each student a journal. Show them the laminated picture of the animal and the tree or cave pattern. Explain and demonstrate that they will have to put the animal in the hole of the tree or cave while blindfolded. In their journals or on individual tree or cave patterns have students predict where they think they will be able to put the animal by making a X on the spot.

Students will play a game similar to pin the tail on the donkey. Blindfold each student, turn them around two times, give them the animal and send in the direction of the tree.

Mark the student's initials on the squirrel where they first place it on the tree. Have the student record their actual placement of the animal in their journal. Continue this procedure until all students have a turn. Afterward, discuss the student's results and compare them to their predictions. Using the chart paper, make a class graph with three columns; one column for in the hole/cave, one for next to the hole/cave, and one for far away from the hole/cave. Record the class results on the graph and have students copy the class data onto their own individual graphs.

To close the lesson, I will read the book; *Brown Bear, Brown Bear, What Do You See?* (Martin, 1970). Following the story, we will discuss the book. This predictable rhyming text explores sight, colors, and animals in an entertaining manner. It will be used to review the lesson by asking comprehension questions that assess what they have learned.

Assessment: I will assess learning by asking the questions: Why do we need our sense of sight? What can we tell about our world using sight? How does our sense of sight help us learn? What would happen if we couldn't see? What can we do to make up for not being able to see? (Lesson adapted from Delano, Gossett, Kammer, Welk & Wood, 1994.)

Lesson 3: How we care for our eyes

Objective: Students learn about ways to care for their eyes.

Materials: Magazine photos of people wearing glasses

Procedures: Use magazine photos to make a display showing people wearing glasses, sunglasses, and eye protection. Ask: How are these pictures alike? Do you know anyone who wears glasses? Why do they wear them? (To see better.) What are some other ways we can take care of our eyes? (Protection gear, avoiding rubbing or putting anything in or near your eyes.) Who can help us take better care of our eyes? (The eye doctor or nurse.) Discuss good eye care and list examples, such as using protective gear in sports and on the playground, and avoiding dangerous toys and pointed objects. Students make a list of ways to keep eyes safe. Ask the school nurse to conduct eye exams for your class. (Lesson adapted from The Southwest Educational Development Laboratory SEDL, 2009.)

Hearing

Hearing, also called audition is one of the traditional five senses. It is the ability to recognize sound by detecting vibrations in the ear. Deafness is the inability to hear. Like touch, hearing is a very specialized sense. Tiny hair fibers in the inner ear detect the vibration of a membrane. The ear detects vibrations and converts them into nerve impulses. These vibrations are perceived by temporal lobe of the brain (Wikipedia, , 2009, Hearing).

An audiometer is used to measure the sensitivity of hearing. Hearing tests can provide accurate measurements of hearing thresholds even in unconscious subjects. Due to the technical advances in these tests, hearing screening for infants has become widespread (Hain, T.C., MD, 2008, Hearing Testing)

The hearing range for loudness (amplitude) and pitch (frequency) varies for each species. Since communication is the main use of sound, hearing is very important for survival and reproduction. Hearing can be much more acute to the range of pitches in calls and speech, in animals that uses sound as the primary way to communicate.(Wikipedia, 2009, Hearing).

Human beings are capable of hearing audio and sonic frequencies between the ranges of 20Hz and 20,000Hz. (Hz is the abbreviation for cycles per second). Above human audio frequencies is the ultrasonic range, which is used by bats while in flight to locate prey and for echolocation. Dogs can hear also hear very high ultrasonic frequencies. This is why they are able to hear a "silent" dog whistle. Whales, giraffes and elephants can hear infrasonic frequencies (below human audio) which they use for communication. Snakes can sense infrasound through their bellies (Wikipedia, 2009, Hearing).

Adults as well as children can damage their hearing and increase their risk for noise-induced hearing loss (NIHL). NIHL, which can be permanent, is caused by loud noises that last for a long time (National Institute on Deafness and Other Communication Disorders, 2009). These loud noises can damage the tiny sensory hairs cells in the inner ear. Therefore, it is very important to prevent even small hearing losses, which can affect children's success in school, in sports or other activities. As they become adults, NIHL can affect their personal relationship and job opportunities as well. Activities that can damage a person's hearing include: loud music from concerts and music players, sporting events, loud machinery such as lawnmowers and saws, gunfire, trains, planes and other vehicles, and even loud crowds like found in school cafeterias (National Institute on Deafness and Other Communication Disorders, 2009, It's a Noisy Planet, Protect their Hearing).

Adults and children can lower their risk for NIHL by following some simple habits to protect their hearing like turning down the volume on entertainment systems (e.g., MP3 players) or wearing earplugs or earmuffs in noisy environments (National Institute on Deafness and Other Communication Disorders, 2009, US Dept. of

Health & Human Services).

Lessons 4: Secret Sounds

Objective: Students will use their sense of hearing to focus on sounds of objects they can not see or touch.

Materials: For the class: 5 boxes with lids, 5 duplicate sets of small objects for matching (2 toy cars, 2 jacks, 2 pennies and 2 small blocks), chart paper, and optional: wrapping paper or ribbon.

Vocabulary: sound, hearing, loud, soft, high and low pitch.

Procedure: As an introduction, read a book on sounds and hearing. (see book list) Show students wrapped box and discuss how difficult it is to wait to open gifts. Ask, how could you tell what your gifts are without opening them? Help students discover which sense they could use to discover what is in the box. Allow each student to handle the box and listen to the sounds the object inside is making as the box is moved around. Ask them to identify what sound the contents make (sliding, rolling, etc). Introduce the 5 duplicate objects before asking them to identify them in the sealed boxes. Have students make a prediction as to what object is hidden. Use chart paper to record their predictions and guesses. Repeat with other objects. To close the lesson, have students open the sealed boxes and see if their predictions were correct. Discuss what clues were the most helpful in discovering the contents of the boxes. Ask, what sense did we use to figure it out? How could we make the discovery easier or harder? Extension activity: Have students create their own secret boxes to share with the class. For the writing center:

Students will complete the sentence frame, "I hear

with my ears. My ears help me to....Assessment: I would assess learning by asking the questions: Why do we need our sense of hearing? What can we learn about our world with our sense of hearing? How can we protect our hearing? (Lesson adapted from Unit K Five Senses, 2009.)

Lesson 5: Vibrations

Objective: Students will learn that sound is produced when objects vibrate and that sound travels.

Materials: (Part 1) Tuning fork; pan with water; cereal flakes; rubber band; drum; radio; paper towels (Part 2) Paper-towel tubes; a ticking clock or timer; plastic tubing six feet to eight feet in length; two funnels; masking tape

Part 1

Procedures: To introduce the lesson, explain that when objects vibrate they create sounds. Show and demonstrate how the different objects vibrate; striking a tuning fork and dip it in water; sprinkling cereal flakes on a drum, then tap the top of the drum; stretching a rubber band between two fingers and pluck it; stretch the elastic farther and pluck it again; putting your hand on the top of a playing radio. Give students some time to explore the objects and test out how they vibrate. Students then describe the sounds they hear and how the sounds change. Explain that our voices are also created by vibrations in our throat. Help students locate their voice box (larynx) by putting their fingers on the front of their throat. (Be careful that you don't press hard). Have students make a sound and describe what they felt as the noise was coming out. To conclude the lesson, ask: What did you feel when you touched the tuning fork after you hit it? What did the rubber band do when you plucked it? What did it do when you stretched it farther and then plucked it? How do vibrations change sounds? What was each one of these objects doing as it was making a sound, including your throat? (Adapted from Unit K Five Senses, 2009.)

Part 2

Procedures: Before the lesson, you will need to set a ticking clock or timer on one side of a wooden table and put one opening of a cardboard tube on the other end of the table. Have students take turns holding an ear to the other end of the tube to hear the ticking coming through the tube. To each end of the plastic tubing attach a funnel, using masking tape. Explain to students that the ear is something like a tube with a funnel. Sound comes in through the outer part of the ear, which is like the funnel, and travels through a tube called the auditory canal. Before using the tube, have student partners stand six to eight feet apart while one whispers a message to her/his partner too quietly for the partner to hear. Then, one partner whispers the message into one of the funnels while the second child listens through the other end. Partners take turns listening and whispering. To conclude, ask the students to list every object that was vibrating to make the sound heard. Discuss that when the students whispered without the aid of the funnel, the sound was not loud enough to be heard from that distance. The sound waves also traveled through the air and through the funnel. (Lesson adapted from Unit K Five Senses, 2009.)

Lesson 6: Warning Vibrations

Objective: Students will learn that sounds can warn us of danger.

Materials: Sticks; balls; bells; audio tape of sounds of the siren, cry for help, fire bell, etc.

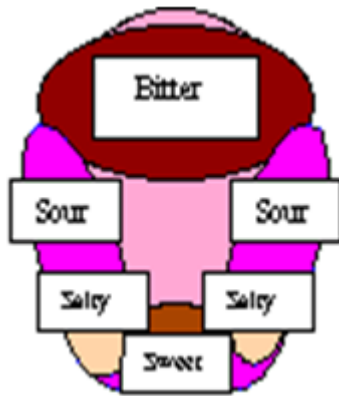
Procedure: Before the lesson, hide several objects (sticks, balls and bells that produce sound) behind a box or board. One at a time, use the objects to make sounds and have students try to guess what is making the sound. Play the audio tape of the sounds of the siren, cry for help, etc. and ask students how these sounds are alike? Guide them to understand that people are in danger and our sense of hearing helps us detect that danger. Ask: If you couldn't hear, what are some ways you could detect danger? (Sound vibrations and other senses, like smell and sight) (Lesson adapted from Unit K Five Senses, 2009.)

Taste

Taste also known as gustation is one of the two main chemical senses. Receptors or buds on the tongue can detect at least four different types of tastes. In humans, these receptor cells or taste buds are found on the surface of the tongue, along the soft palate, and in the epithelium of the pharynx and epiglottis. (Wikipedia, 2009, Taste-Ofaction.) The receptors for sweet, salt, sour, and bitter tastes are found on different regions of the tongue. Sweet tastes are concentrated on the tip of the tongue, salty and sour tastes on the sides and bitter tastes on the back (see figure below) (New World Encyclopedia-Sense, 2009) and (Nature Neuroscience, 2000).

Taste is made up of different components: flavor, the sensation of food in the mouth; texture and temperature, and food's smell. The brain's perception of flavor is closely related to the smell of food as well as taste. The texture of food is detected by mechanoreceptors in the mouth and food's temperature is detected by the mouth's thermoreceptors. The olfactory epithelium in the nose detects the food's smell.

As we age our sensitivity to taste can change. Babies are very sensitive to different foods because of the amount of taste buds on their tongue, sides of their mouth, and roof.



Taste buds become less sensitive, as we get older, because the taste buds we were born with begin to disappear from the sides and roof of our mouths. This can mean that we will be more likely to eat foods that were too strong for us when we were young. Sour

Areas of taste on the tongue (The tip of the tongue is at the bottom of the image.)

Lesson 7: What's the Flavor?

Objective: The students will learn that they taste different flavors on different regions of the tongue.

Materials: A variety of food samples; water; paper cups (one for each type of food); chart paper; box of toothpicks; markers; blindfolds; diagram of areas of taste.

Procedure: Prior to the lesson, determine if there are any known food allergies. To begin, read a book on taste from the reading list. Display the diagram of the four taste regions of the tongue for reference. Explain that students will be blindfolded and asked to taste different flavors on different regions of their tongue. Demonstrate by using a student volunteer to model the placement of the food samples on the tongue. Using a toothpick, place a small amount of one type of food on one region of the tongue. Students can refer to the diagram of the tongue for help. The blindfolded student judges the taste with the mouth still open so the food sample is not spread to other regions of the tongue. Students record the judgment each time. Rinse the mouth with water between tastes. After placing the first food type on all four regions of the tongue and recording the taste differences, continue to taste the next food. When finished testing, the partner performs the test the same way. To conclude: Students draw a diagram of the tongue and write about the flavors the tongue tastes. (Lesson adapted from Unit K Five Senses, 2009.)

Lesson 8: The Nose Knows

Objective: The students will understand that the nose plays an important role in the flavor of food.

Materials: Foods to taste: fruit or vegetable slices, baby food, jelly beans and blindfold. Procedure: Prior to the lesson, determine if there are any known food allergies. To begin, explain that our sense of smell is very important to our sense of taste. Tell students that we will test how our taste is affected when we can't smell. To demonstrate this, blindfold a student and have them hold their nose. Have the student taste a pear or apple slice. Ask: Can they tell the difference between the two slices? Baby foods and Jelly beans are also good comparison items because they come in a variety of flavors and they have the same texture. The advantage of using the baby foods and jelly beans is the blindfolded person will not be able to use touch information to distinguish the different items. To conclude: Ask, How did they use taste to determine what food they were

eating? Do you think it would be easier to determine if they could see? How does not seeing effect their sense of taste? (Lesson adapted from Neuroscience For Kids, 2009,Taste-Gustation.)

Lesson 9: Doesn't Always Believe What You See

Objective: Students will become aware of how the sense of taste is affected by their sense of sight.

Materials: For the class, 4 clear zip lock type plastic bags (numbered 1-4), 1/2 c. salt, 1/2 c. flour, 1/2 c. powdered sugar, 1/2 c. granulated sugar, water, chart paper and markers. For each student, magnifying glasses, plastic spoons, paper plate (divided into 4 sections)

Procedure: Prior to the activity, determine if there are any known food allergies and set up bags by putting 1/2 cup of salt in bag #1, 1/2 cup of powered sugar in bag #2, 1/2 cup of flour in bag #3, and 1/2 cup of sugar in bag #4. Show the class the four bags and ask students to look at each bag and try to guess the contents of the four plastic bags. Record students' predictions on chart paper. Ask: Can you tell what is in the bags just by looking at them? What other senses can help us tell what's in the bags? How can we tell if they are different if they look alike? Give students plastic spoons, quartered paper plates and water. Instruct students to put 1/2 tsp. of each substance onto their plates, one in each section. Assist students if necessary. Have students take a closer look at the different substances using magnifying glasses. Discuss in more detail what each substance looks and smells like. Have students then taste each substance sipping water in between tastes. Ask: What do you think the substance is? What sense did you use to decide? (taste) Did any substances taste the same? (salty, sweet) What part of your body did you use to decide? (tongue/mouth) How does your tongue help you taste? (review taste buds) Show class a map of taste buds on a tongue. To conclude, review the experiment and discussion. Make sure students understand that this was a safe experiment but, students should never taste anything they don't know when adults are not there. (Lesson adapted from Unit K Five Senses, 2009.)

Smell

Smell, also known as olfaction, is the other chemical sense. But different from taste, hundreds of olfactory receptors, on millions of olfactory cell, bind individual molecular features. The different features of these odor molecules are able to turn on or off receptors. The combination of signals makes up our perception of smell. The olfactory system, in the brain, processes all the different smells. Unlike most other neurons, the olfactory receptor neurons in the nose are able to regenerate after they die. Anosmia is the term used for the inability to smell. (Wikipedia, 2009, Sense)

Lesson 10: Mystery Scents

Objective: Students will become aware of the information given to them through the sense of smell and how other senses affect the sense of smell.

Materials: For the class; extracts (peppermint, lemon, orange), clay dough (see recipe below), red food coloring, chart paper. For each student; white paper.

Procedure: Prior to activity, make several batches of clay dough recipe. Each recipe makes 5 balls of clay about the size of a tennis ball. You will need 3 balls for each group of 6 students.

Clay Dough Recipe: 3 c. flour, 1 1/2 c. salt, 3 c. water, 2 tbs. oil, 3 tsp. cream of tartar.

Cook over low heat, stirring constantly until mixture is the consistency of mashed potatoes, and it begins to

"lump." Remove from heat and knead, until a dough-like consistency is reached. Divide dough into balls the size of tennis balls. Color one tennis-ball sized portion for each group with red food coloring and scent it using lemon extract.

Introduce the uncolored, unscented clay dough to each group of students. Have them look at and touch each of 3 balls to understand that they look and feel the same. Make a "well" in each of the balls and put 3-5 drops of one of the extracts into the "well". Knead the clay to spread the scent. Follow the same procedure for the other 2 balls using different scents. Give each student a piece of paper. Tell them to fold it in half and then fold it in half again so they have 4 spaces. Have them number the spaces 1-4. With one ball of scented clay, pinch off enough to give each student in the group a walnut-sized piece. Tell each student to place this piece of clay in the first space on their papers. Do the same with the other balls of clay. Make sure students do not mix the pieces of clay together. Have students smell each piece of clay and record their guesses on the chart paper. Show students the clay dough that was colored and scented. Ask them to predict what the scent will be by simply looking at it. Record their predictions. Then give students a walnut-sized piece to smell. Have them place it on the fourth space on their papers. After the activity, ask students if all the clay looks the same or different? How can we tell the difference between the clay that looks the same? What sense did you use to name the scent of the clay? Does your sense of smell or your sense of sight tell you what the scent of an object is? If an object seems to be the wrong color, does it confuse our sense of smell? As an extension activity, color additional samples of clay a color that would be confusing with the scent added. To add sense of taste to the activity, use non-flavored gelatin. Add extract to the unflavored gelatin, and add food coloring that would confuse the students. For example: green-colored gelatin with orange-flavored extract. (Lesson adapted from Delano & Gossett et al.,1994.)

Touch

The sensory modalities such as touch, temperature, proprioception (body position), and nociception (pain) are part of the somatosensory system. The skin and epithelia, skeletal muscles, bones and joints, internal organs, and the cardiovascular system are covered with sensory receptors.. Using different receptors; thermoreceptors, mechanoreceptors and chemoreceptors, the sensory system is able to react to diverse stimuli. Sensory nerves travel through tracts in the spinal cord and into the brain allow transmission of information from the receptors. The somatosensory area in the parietal lobe of the cerebral cortex is primarily responsible for processing.

The system works when a specific stimuli such as heat triggers a sensory neuron; this neuron passes to an area in the brain corresponds to that area on the body allowing the processed stimuli to be felt at the correct location. A homunculus is the mapping of the body surfaces in the brain and is essential in the creation of a body image. This is represented by a disfigured human with disproportionately huge hands, lips, and face in comparison to the rest of the body. Areas of the body with more sensory connections to the brain are represented as being larger on the homunculus.



Sensory cortical homunculus in primary somatosensory cortex.

Cortical homunculus. (2009, June 5). In Wikipedia, The Free Encyclopedia. Retrieved 16:42, June 5, 2009, from http://en.wikipedia.org/w/index.php?title=Cortical_homunculus&oldid=294602910

Lesson 11: Touch and Tell

Objective: Students will identify and isolate the sense of touch from sight and hearing. **Materials:** A cardboard box or pillow case, socks, scissors (to cut socks), tape (duct tape is best), decorations for the box: drawings, pictures, objects to put in the box or bag, Things to try: familiar objects: cup, spoon, ball, block, sponge, fruit, sponge, rock, cotton ball, leaf, pinecone, feathers. **Difficult objects:** wood letters, wood numbers, foil, peanuts, bar of soap, sponges cut up in similar and different shapes, plastic cut-out bath letters and animals (the kind that you can throw into the bathtub) and, gloves (for the glove treatment portion of the experiment).

Procedure: To begin the lesson, you will make a "Brain" Box by using a cardboard box a little larger than a shoebox. Cut a hole big enough to put your hand through, on one side of the box. Cut off the toe of an old sock to make a tunnel from the hole outside the shoe box. Tape the sock to the outside of the box to secure. Students can paint or decorate the outside of the box. The objective is for students to put their hand in the box and try to guess what they are feeling without seeing. Another option is to make a "Brain" bag, using a pillowcase with an elastic band to close off the opened end. To challenge the students, place several objects in the box or bag at once. Ask students if they can name the objects inside. Discuss the texture of the objects: smooth, rough, bumpy, soft, hard, etc. Students use identical objects to try to identify the object they are feeling. For the glove treatment activity, have students put on a pair of gloves such as dishwashing, latex or work gloves. To reduce the tactile (touch) information, have student try the activity while wearing the gloves. (Lesson adapted from Neuroscience Site for kids, 2009, Touch-Experiments.)

Lesson 12: Head, Shoulder, Knees and Toes...

Objective: Students learn about the sensitivity of different parts of the body.

Materials: Blindfolds, different objects: tennis ball, eraser, candle, rock, sponge, pine cone.

Procedure: Explain to students that they will use their sense of touch to guess what objects are using different parts of their bodies. Gather several different objects with interesting shapes, sizes and textures. To begin, group students into partners and ask one student to close their eyes (or use a blindfold) and have their partner touch the items to different parts of the person's body, for example touch a tennis ball to their head, shoulder, knee, back, finger, hand and foot. Ask students if they can identify the object. How difficult is it? Is it easier to identify objects using one part of their body than another? Which body part is easiest to tell what the

object is?

(Lesson adapted from Neuroscience site for kids, 2009, Touch-Experiments.)

Culminating Lesson 13: Sense-able Picnic (Post-Assessment)

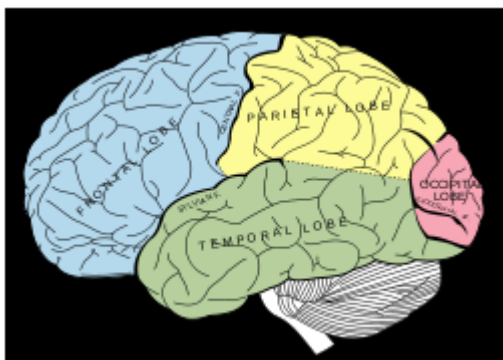
Objective: Students will construct a book which encompasses their understanding of all five senses.

Materials: For the class; stapler, chart paper and marker. For each student; teacher made sense-able picnic book, markers, crayons, or colored pencils, scissors and glue.

Procedure: Prior to activity; make a chart entitled Our Sense-able Picnic and make columns for each of the 5 senses at the bottom. Prepare materials for students to create a My Sense-able Picnic Book using the phrases; In my picnic basket, I see (I hear, I smell, I taste, and I feel). To introduce the activity, show the class the chart and tell them that you are going to go on a pretend picnic. This picnic will be a five senses picnic. Ask them to brainstorm foods they might take on the picnic which they can see, hear, smell, taste, and touch. Record their responses on the chart as students describe the senses they would use to experience the food items on the picnic. Introduce the Five Senses student books. Tell them that they have to include one item for each of the five senses, all the items must be edible, and they all must fit into a picnic basket. Have students assemble their books by stapling the pages together. Have them draw two pictures of each of the foods they have decided to pack. One picture is for the book and one for the class graph. Direct students to complete the sentences on the pages of the book. They can do this by writing in or drawing a food for each sense. After sharing the items that appear in the books, begin the process of graphing using a five senses column bar graph using the second set of pictures they drew. Guide students to generalize that each of the five senses (with a few exceptions) can apply to any food that could be taken on a picnic. Afterwards, tally and discuss the results. Compare their results to their original predictions. Ask: Did anyone put the items from our brainstorm list in their books? How could you tell? Which sense do you think is the most important when going on a picnic?

Extension activity: Have each student bring a snack item to school. Chart or graph what was brought, then go on a "snack picnic". (Lesson adapted from Delano & Gossett et al.,1994.)

The Brain's Connection to your Senses



Lobes of the brain

Principal fissures and lobes of the cerebrum viewed laterally. Figure 728 from Gray's Anatomy. 28 November 2006 Vectorized in CorelDraw by Mysid, based on the online edition of Gray's Anatomy.
<http://commons.wikimedia.org/wiki/File%3AGray728.svg?uselang=en>

The brain can be divided into four different sections, called lobes. The lobes control our emotions, reasoning, hearing, vision, and much more.

Frontal Lobe

Located in the front of your brain around your forehead, the frontal lobe is responsible for emotions, reasoning, planning, movement, and parts of speech. It's connected to purposeful acts such as creativity, judgment, problem solving, and planning as well.

Parietal Lobe

Located behind the frontal lobes above the temporal lobes and at the top back of the brain, the parietal lobes are connected with the processing of nerve impulses related to the senses, such as touch, pain, taste, pressure, and temperature. They are responsible for language functions

Temporal Lobe

Located on either side of the brain and just above the ears, the temporal lobes are responsible for hearing, memory, meaning, and language. The temporal lobe also plays a role in emotion and learning. They interpret and processes auditory stimuli.

Occipital Lobe

Located in the back of the brain, the occipital lobe is responsible for the brain's ability to recognize objects. It also controls our vision.

Thalamus

Located in the center of the brain, the thalamus controls your sensory and motor integration. As the thalamus receives information from the senses it sends this information to the cerebral cortex. The thalamus also receives information from the cerebral cortex which it sends to other parts of the brain and brain stem.

Resources:

Student Reading List:

Aliki. (1962). My five senses. New York: Harper Collins Publishers.

This book gives a good overview of the five senses and explains that sometimes we use just one or two senses, sometimes all five.

Aliki. (1962). My hands. New York: Thomas Y. Crowell.

Describes the parts of the hand and all the things our hands help us to do.

Brighton, C. (1984). My hands, my world. New York: MacMillan Publishers.

Allington, R., L., Cowles, K., & Thrun, R. (1980).

Brown, M.T. (1979). Arthur's eyes. Boston: Little, Brown and Company.

Arthur's friends tease him when he gets glasses, but soon learns to wear them with pride.

Brown, M. T. (1976). Arthur's nose. Boston: Little, Brown and Company.

Unhappy with his nose, Arthur visits the rhinologist to get a new one.

Cole, J. W., & Welch, K. (1977). My nose knows.

Oklahoma City: Economy Company.

Sniffwell is told that his nose is for smelling, and he learns to enjoy the smells found in his environment.

Leaf, M. (1962). Ferdinando the bull. New York: Scholastic.

Ferdinando, unlike other bulls, prefers to sit and smell the flowers, rather than display his strength and ferociousness.

Martin, B. Jr. (1970). Brown bear, brown bear, what do you see? New York: Holt, Rinehart and Winston.

A predictable rhyming book that explores sight, colors, animals, etc., in an entertaining manner.

Miller, Margaret. (1998). My Five Senses. Simon & Schuster Children's Publishing

A simple introduction to the five senses and how they help us experience the world around us.

Rius, M., Parramón, J. M., & Puig, J. J. (1985). The five senses: Hearing. Hauppauge, NY: Barron's Educational Series.

A short scientific explanation of our sense of hearing, with a diagram of the ear.

Rius, M., Parramón, J. M., & Puig, J. J. (1985). The five senses: Taste. Hauppauge, NY: Barron's Educational Series.

A short scientific explanation of our sense of taste.

Roca, Nuria (2006). 5 Senses. Hauppauge, NY: Barron's Educational Series, Incorporated

Beginning readers follow the activities of two children who take delight in discovering the world around them.

Teacher Resources:

Abruscato, J., Fossaceca, J. W., Hassard, J., & Peck, D. (1984). Holt science. New York: Holt, Rinehart and Winston.

A basic introduction to the nervous system and senses.

Baines, F. (1998). Senses: How We Connect With The World. Danbury: Grolier Educational.

After a brief introduction to the senses and nervous system

Bennett, P. (1998). My Brain and Senses. Parsippany, NJ: Silver Press.

A basic introduction to the nervous system and senses.

Cole, C. and Degen, B. (1999). The Magic School Bus Explores the Senses .New York: Scholastic.

The book includes a huge amount of information about the five senses, yet it is done in such a wacky and interesting way.

Fulbright, R.K. (2001). Functional MR Imaging of Regional Brain Activation Associated with the Affective Experience of Pain, American Journal of Roentgenology, vol. 177

Freud, S.(1923) The Ego and the Id -Das Ich und Das Es. W. W. Norton & Company

In 1923, in this volume, Freud worked out important implications of the structural theory of mind that he had first set forth three years earlier in Beyond the ...Pleasure Principle. The Ego and the Id ranks high among the works of Freud's later years.

Poppe, C. A., & Van Matre, N. A. (1985). Science learning centers for the primary grades. West Nyack, NY:

Center for Applied Research in Education.

Rius, M, (1985) Sight. Hauppauge, NY: Barron's Educational Series, Incorporated

Text and illustrations present pleasant sights we can see. Included is a short scientific explanation of our sense of sight, with a diagram of the eye.

Sacks, O. (1985) The Man Who Mistook His Wife for a Hat. New York, NY: Simon & Schuster Adult Publishing Group

Oliver Sacks tells the stories of individuals afflicted with fantastic perceptual and intellectual aberrations: patients who have lost their memories and with them the greater part of their pasts; who are no longer able to recognize people and common objects; who are stricken with violent tics and grimaces or who shout involuntary obscenities; whose limbs have become alien; who have been dismissed as retarded yet are gifted with uncanny artistic or mathematical talents.

Suzuki, David (1996). Looking at Senses. Stoddart Publishing Co., Canada

Tells about the common human senses such as sight, hearing, taste, and touch, and also about the more uncommon ones, such as ESP.

Trostle, S. L., & Yawkey, T. D. (1990). Integrated learning activities for young children (Getting Started).Boston: Allyn and Bacon.

Ziefert, H. (2002). You Can't Taste a Pickle With Your Ear. New York: Blue Apple Books.

A good choice for those who want a brief introduction to the senses.

References

Audiometer. (2009). In Wikipedia, The Free Encyclopedia. Retrieved June 11, 2009, from <http://en.wikipedia.org/w/index.php?title=Audiometer&oldid=295857358>

Chaudhari, N., and M.A. Landin and S.D. Roper.(2000). A metabotropic glutamate receptor variant functions as a taste receptor. Nature Neuroscience 3, no. 2

Delano, J.& Gossett, C.S.& Kammer, V.& Welk, V. & Wood, C. (1994). Sense-able Science. Fresno,CA.: AIM Educational Foundations.

Hain, T.C., MD, 2008, Hearing Testing. Retrieved June 11, 2009, from http://www.american-hearing.org/testing/hearing_test.html#audiometry

Hearing (sense). (2009). In Wikipedia, The Free Encyclopedia. Retrieved June 18, 2009, from [http://en.wikipedia.org/w/index.php?title=Hearing_\(sense\)&oldid=297262677](http://en.wikipedia.org/w/index.php?title=Hearing_(sense)&oldid=297262677)

National Institute on Deafness and Other Communication Disorders (n.d.). National Institute on Deafness and Other Communication Disorders health disparities strategic plan fiscal years 2004-2008. Retrieved June, 2009 from www.nidcd.nih.gov/about/plans/strategic/health_disp.asp.

National Institute on Deafness and Other Communication Disorders (n.d.). It's a Noisy Planet. Protect Their Hearing. Retrieved June, 2009 from <http://www.noisyplanet.nidcd.nih.gov/press/protect.htm>

Neuroscience for Kids (n.d.). Taste-Gustation. Retrieved June, 2009 from <http://www.dls.ym.edu.tw/neuroscience/chtaste.html>

Neuroscience for Kids (n.d.). Touch Experiments. Retrieved June, 2009 from

<http://faculty.washington.edu/chudler/chtouch.html>

Olfaction. (2009). In Wikipedia, The Free Encyclopedia. Retrieved June 29, 2009, from <http://en.wikipedia.org/w/index.php?title=Olfaction&oldid=299216244>

Sense. (2009). In Wikipedia, The Free Encyclopedia. Retrieved June 29, 2009, from <http://en.wikipedia.org/w/index.php?title=Sense&oldid=299227476>

Taste. (2009). In Wikipedia, The Free Encyclopedia. Retrieved July 22, 2009, from <http://en.wikipedia.org/w/index.php?title=Taste&oldid=303474012>

The Southwest Educational Development Laboratory SEDL (2009). Unit K Five Senses.

Retrieved June, 2009 from www.sedl.org/scimath/pasopartners/pdfs/fivesenses.pdf

The New World Encyclopedia. (n.d.) Sense. Retrieved June, 2009 from <http://www.newworldencyclopedia.org/entry/Sense>

U.S. Department of Health & Human Services-National Institutes of Health National Institute on Deafness and Other Communication Disorders (2008) NIDCD Fact Sheet: Noise-Induced Hearing Loss. Retrieved June, 2009 from <http://www.nidcd.nih.gov/staticresources/health/hearing/NoiseInducedHearingLoss.pdf>

Visual perception. (2009). In Wikipedia, The Free Encyclopedia. Retrieved June 23, 2009, from http://en.wikipedia.org/w/index.php?title=Visual_perception&oldid=298137286

Appendix

Standards

This unit will be integrated directly through language arts and technology to meet CT Health and Science Standards. The Connecticut Science Standards for Kindergarten state objects have properties that can be observed and used to describe similarities and differences. The Core Science Curriculum Framework states that some properties can be observed with the senses, and others can be discovered by using simple tools or tests.

The grade level expectations are:

- 1) Students should be able to match each of the five senses with its associated body part and the kind of information it perceives.
- 2) Students should be able to make scientific observations using the five senses, and distinguish between an object's observable properties and its name or its uses.
- 3) Students should be able to classify organisms or objects by one and two observable properties and explain the rule used for sorting (e.g., size, color, shape, texture or flexibility).
- 4) Students should be able to use simple tools and nonstandard units to estimate or predict properties such as size, heaviness, magnetic attraction and float/sink.
- 5) Students should be able to describe properties of materials such as wood, plastic, metal, cloth or paper and sort objects by the material from which they are made.
- 6) Students should be able to count, order and sort objects by their observable properties.

(Connecticut State Department of Education March 2009).

Additionally, this unit is aligned with New Haven Public School's student goals which list the following standards and indicators:

- 1) K.1 Objects have properties that can be observed and used to describe similarities and differences.

- 2) A.2 Sort objects made of materials such as wood, paper and metal into groups based on properties such as flexibility, attraction to magnets, and whether they float or sink in water.

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