HEAL THE BAY
SANTA MONICA PIER
AQUARIUM

Scientist Senses

Pre-K & Kindergarten

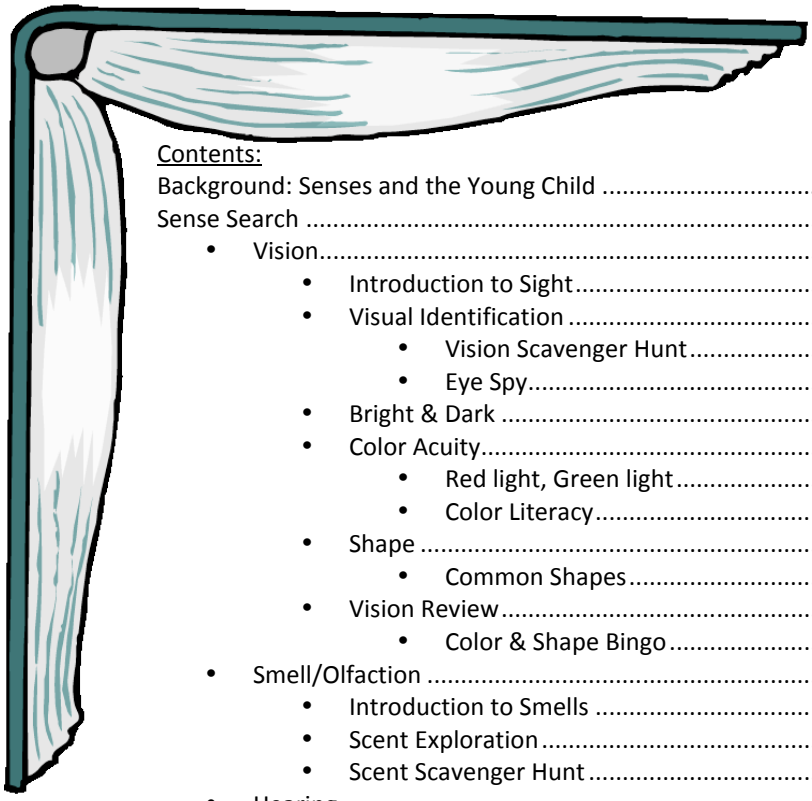
Teacher Packet

INSTITUTE of Museum and Library SERVICES

This project is made possible by a grant from the U.S. Institute of Museum and Library Services.

Notes for the teacher:

Thank you for picking the Santa Monica Pier Aquarium as your field trip destination! We are very excited that you will be visiting our facility. This packet was developed to help you, as the classroom teacher, and your students get the most out of your visit. Enclosed in this packet, you will find information and activities that correlate to the program you will be attending with your class.



Contents:

Senses and the Young Child

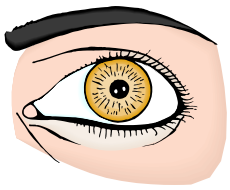
Studies are showing what early childhood teachers have known for years, more learning takes place in the first five years of a child's life than in almost the rest of his or her life combined. The research is also showing that it is not just what children are learning, but how they learn that is very important too. Positive associations with subject manner can last throughout a child's formative years. The activities included in this packet are designed to encourage students to explore their senses in a safe, supportive, and fun manner. Always remember that you are the expert in what your students can handle; only undertake those activities you feel your students can handle and will enjoy. We look forward to hearing about any alterations or variations you might make to the activities that increased student engagement and retention of the material.

In every branch of science, keen observation skills are very important. As scientists and as humans, learning takes place when we see, hear, smell, touch or taste new things, or similar things, but under new conditions. Senses are also extremely important in visual and performing arts, taking our internal emotional experience and literally turning it into something that can be experienced with the senses. Providing a healthy emotional outlet for children in the form of arts experiences can result in a more balanced, content child. Emotional health is important to proper development in children, and emotionally balanced children tend to be faster learners. Additionally, many studies are showing that music education at an early age increases math and arithmetic comprehension as students age. Some basic academic skills such as reading and writing are literally impossible without the senses. All of this information really drives home how important basic sensory understanding is in the young child.

The connections between their senses and their understanding of topics or skill at activities are not obvious to young children yet. They are just learning the connections between their senses and the world around them. Defining and elucidating those connections can be an important step in the process of children coming to understand the world around them.

Traditionally, there are five senses that tell us what is going on around us: sight, hearing, taste, smell, and touch. These five classical senses help us to comprehend the sound waves, light waves, chemicals, and physical objects that we encounter every day. Without our senses, it would be very difficult to comprehend the myriad signals.

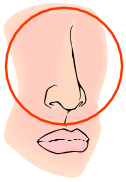
Our eyes are the organ responsible for taking in the light waves around us. They translate the information into signals our brain can understand, and turn those signals into images in our head. Not all animals have eyes capable of making three dimensional, color pictures; humans are one of the few that can do this. Many animals can, however, sense light outside our visible range or subtle color perception. At their most basic level, eyes take the light waves in and translate the information; however the translation differs from animal to animal.



The Human Eye

The Ear

Our ears are the organ responsible for taking the sound waves around us and, like the eyes, translating that information into usable signals for the brain. Again, not all ears have the same capabilities. Some ears, like that of dogs, are able to hear much higher frequencies of sound than humans, while the baleen whales and elephants can hear frequencies well below the ability of the human ear.



The Nose

Both the nose and the tongue are capable of translating chemicals into signals that the brain can understand. The nose takes in chemicals that are airborne, while the tongue must actually touch concentrated amounts of a chemical, usually in liquid or solid form. Some noses, like that of dogs and some species of insects, have many more smell receptors than do human noses. Extra receptors give the possessor the capacity to detect a greater range of chemicals (and/or chemicals in lower concentrations) than those noses without the additional receptors. The tongue too can differ in its chemical receptors. Even among humans, some tongues can discriminate among a larger range of chemicals than others. It is generally recognized that different areas on the human tongue are responsible for sensing different "tastes."

Taste Receptors of the Human Tongue

Image source: http://www.dblink.org/lib/dish/template_clip_image006.jpg

Touch is often the sense most familiar and most comfortable to students. Babies instinctually want to touch things around them to try and figure them out. By the time a child reaches school age, they understand that touching an item gives them important information about that item. In touching, nerves in the skin can sense changes in temperature (is an item cold or hot?), changes in pressure (is it soft or hard?), or even changes in those changes to tell if an item is motionless or moving. Sensory nerves in the skin can also determine whether or not an item is damaging tissue (i.e. it hurts), or if it itches or tickles. One touch can, therefore, provide people with a large amount of valuable information when trying to understand new and different things they might encounter.

Encouraging students to explore their senses is important to holistic child development. Students learn through experiencing the world through their senses. Each sense used to explore an item or event creates at least one neurological connection. Therefore, the more senses used to explore, the greater number of neurological connections made in a young brain. Creating more neurological connections increases the chances of a person remembering.

Accurate and detailed observation and sensory skills are the most fundamental and necessary tools of scientists, artists, writers, mathematicians, and musicians, to name a few. Indeed, one is hard-pressed to find a job or career where sensory skills are not used. Therefore, it is important that the young child have a positive and engaging introduction to these essential abilities to set a firm foundation for his or her educational career, and, indeed, the rest of their lives.

Sense Search

Level
pre-Kindergarten & Kindergarten

Abstract
Through hands-on and interactive activities, students will explore their five senses. The lessons will introduce students to the five senses, the parts of the body that are primarily responsible for that sense, and the different types of things our senses can tell us.

Objectives
Students will be able to:
- ✓ Define the traditional five senses: sight or vision, hearing, smell, touch and taste
- ✓ List the body parts that do the sensing: eyes for sight, ears for hearing, nose for smell, skin for touch, and tongue for taste
- ✓ Name primary and secondary colors, and match the names to the color
- ✓ Name and identify basic shapes such as circles, triangles, squares, stars, and hearts
- ✓ Categorize items as hot or cold
- ✓ Describe items as bright or dark
- ✓ Categorize items by their texture, taste and smell
- ✓ Define sound volume and pitch
- ✓ Describe sounds by their volume and pitch
- ✓ Define texture and taste

Targeted Standards
California Visual & Performing Arts Standards, Grade: Pre-Kindergarten
Visual Arts
Artistic Perception 1.0 Processing, Analyzing, and Responding to Sensory Information: *Through the Language and Skills Unique to the Visual Arts. Students perceive and respond to works of art, objects in nature, events, and the environment. They also use the vocabulary of the visual arts to express their observations.*
Develop Perceptual Skills and Visual Arts Vocabulary
1.2 *Identify colors by name.*
1.3 *Name and describe objects by color and relative size.*
Music
Artistic Perception 1.0 Processing, Analyzing, and Responding to Sensory Information: *Through the Language and Skills Unique to Music. Students read, notate, listen to, analyze, and describe music and other aural information, using the terminology of music.*
Listen to, Analyze, and Describe Music
1.2 *Identify the sources of a wide variety of sounds.*
Creative Expression 2.0 Creating, Performing, and Participating in Music: *Students apply vocal and instrumental musical skills in performing a varied repertoire of music. They compose and arrange music and improvise melodies, variations, and accompaniments, using digital/electronic technology when appropriate.*
Compose, Arrange, and Improvise
2.3 *Improvise simple instrumental accompaniments to songs, recorded selections, stories, and poems.*

California Visual & Performing Arts Standards, Grade: Kindergarten
Visual Arts
Artistic Perception 1.0 *Processing, Analyzing, and Responding to Sensory Information Through the Language and Skills Unique to the Visual Arts. Students perceive and respond to works of art, objects in nature, events, and the environment. They also use the vocabulary of the visual arts to express their observations.*
Analyze Art Elements and Principles of Design

1.3 *Identify the elements of art (line, color, shape/form, texture, value, space) in the environment and in works of art, emphasizing line, color, and shape/form.*

Music

Artistic Perception 1.0 Processing, Analyzing, and Responding to Sensory Information Through the Language and Skills

Unique to Music: *Students read, notate, listen to, analyze, and describe music and other aural information, using the terminology of music.*

Listen to, Analyze, and Describe Music

1.2 *Identify and describe basic elements in music (e.g., high/low, fast/slow, loud/soft, beat).*

California Science Standards, Grade: Kindergarten

Physical Sciences 1. *Properties of materials can be observed, measured, and predicted. As a basis for understanding this concept:*

a. *Students know objects can be described in terms of the materials they are made of (e.g. clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).*

Investigation and Experimentation 4. *Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:*

a. *Observe common objects by using the five senses.*

b. *Describe the properties of common objects.*

d. *Compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).*

e. *Communicate observations orally and through drawings.*

Materials

- See below

Implementation Overview

Time Allotment: Depends on how many and which activities you choose to use in your classroom.

This lesson is divided by each of the traditional five senses.

- Tell students that you will be exploring how people and animals understand what is around them.
- Explain that people understand the world around them in large part by using their five senses.
- Ask students if any of them know what their five senses are. List them on the board as students answer, or as you provide them with the senses (sight, hearing, smell, touch, and taste)
- Tell students you will be working through a variety of activities to explore these five senses.

Vision

Introduction to Sight

- Ask students to tell you what is going on around them in the classroom.
- Ask them to close their eyes and now tell you what is going on. They will probably tell you that they don't know what's going on now.
- Have them open their eyes and explain that our eyes help us to see what is going on around us. They are one of the easiest ways for us to understand what is going on right near us. Point out that our eyes and their ability to see what is going on around us help us to find food, locate friends, and avoid dangers that might hurt us.

Visual Identification

Vision Scavenger Hunt

- Have students undergo a scavenger hunt for things they can see. If you are teaching colors and shapes, this is a great time to reinforce those lessons by having them search for items of a particular color or shape.

Eye Spy

Play Eye-Spy with the students.

Eye-Spy Directions:

- The basic game of Eye Spy is a great one to reinforce sight as a sense as well as honing visual observation skills.
- How to play: find an item or object in the room that you can easily see. Give students clues, by reciting the rhyme to your students: "I spy with my little eye something that is small/large/round/square/black/green (or some other descriptive term you choose)."
- Students will then guess what the item is.
- Repeat the rhyme as many times as needed using different visual descriptors each time.

Bright and Dark

Help students to understand that our vision can tell us if things are bright or dark by turning on or off the lights in your classroom and describing the room as dark, with no lights, and bright, when the lights are on. Remember that you are the judge of your student's comfort and that the dark might be scary to many children. Explain what you are doing as you are doing it, and to avoid any meltdowns, ask students if they are okay with the dark before you turn the lights out.

Color Acuity

Red light, Green light

Play the traditional game of "Red light, Green light," but instead of using words as keys, use colored paper.

Red light, Green light (modified) directions:

For the first round, have the teacher or an assistant be "it." The "it" person stands at one end of the playing field (any open space will do), with the rest of the players in a horizontal line at the other end of the space. The "it" person will hold up a green piece of colored paper, the players will then move quickly towards "it". At any time, "it" can hold up a piece of red paper and all the players must freeze in place. If anyone fails to stop, they are out or must return to the starting line. "It" will need to hold up a green paper to reinitiate play. A yellow piece of paper can also be held up to have children slow down or do some other action (hop on one foot, walk backwards, crawl like a crab, etc) in moving towards "it." The first player to reach the person who is "it" wins and becomes "it" for the next round. You can use other colors as you see fit.

Color Literacy

Most children have little trouble identifying and discriminating among primary colors (red, yellow, blue), secondary colors (orange, green, purple), white, and black. Identifying and discriminating tertiary colors, shades and tones tends to be more difficult. Books are a great way to teach about colors. Some wonderful color books include:

One fish, two fish, red fish, blue fish, by Dr. Seuss

The classic children's color and counting, rhyme book.

Way Down Deep in the Deep Blue Sea, by Jan Peck and illustrated by Valeria Petrone

While this book doesn't focus specifically on colors, it covers animals that are pictured in clear primary and secondary colors.

Fish Eyes: A Book You Can Count On, by Louis Ehlert

This counting book has bright vivid pictures of fish in primary and secondary colors.

The Deep Blue Sea: A Book Of Colors, by Audrey Wood and illustrated by Bruce Wood.

A very basic storybook about color.

In addition to reading the book, have students color a sheet as they read the book. A sample color page that corresponds to the book The Deep Blue Sea: A Book of Colors is included in this packet.

Shape

Common Shapes

Materials:

Shape Cards
Shape Worksheets – One per child
Crayons or Markers – One per child

- Using the enclosed shape cards, explain basic shapes to your students. (This lesson also helps to reinforce basic counting.)
- Circles are round and have no beginning and no end. Trace the edge of the circle for your students and show them how there are no corners. An oval is a stretched out circle.
- Squares have four corners and all sides are the same length. A rectangle is just a stretched out square, so it has four corners but the sides are NOT the same length.
- A triangle has three corners and three sides. Explain to students that triangles can have different shapes by showing them the cards with the isosceles, equilateral, and scalene triangles.
- A star has five points.
- A heart has two points.
- Have students draw the basic shapes on the enclosed work page. Have them draw a circle in box one, a square in box two, etc.

Vision Review

Color & Shape Bingo

Materials:

1 copy of the bingo playing card per student
Master shapes for the teacher
Writing utensils, one per student

- Explain to the students that you will be calling out a color and shape. They need to check their card to see if they have that shape in the color you called. If so, they need to cross it off their playing card. The first student to get a row or column crossed off wins.
- Variation: laminate the cards and use checkers or other marker pieces to keep track of items called.
- Suggestion: as the odds of winning this game are often random, providing prizes to the winners can be very discouraging to those students who know their shapes and colors, but the ones pictured on their cards just did not get called. Therefore, it is recommended that you only provide verbal reinforcement as a prize to the winners or you provide a prize to all the students. Stickers in the shapes and colors you have just covered are a great way to make everyone feel good and reinforce the lesson at the same time!
- Use this activity as an opportunity to assess student comprehension of the concepts of sight, color and shape. Clear up any misunderstandings before moving on to the next topic.

Smell/Olfaction

Introduction to Smells

Most students can tell you if things smell good or bad, but have trouble describing the way things smell in any more detail.

- Start by having students close their eyes, if they are comfortable with that. Ask them if they can tell what is going on around them when they have their eyes closed. Many students will answer no.
- Next, open a box containing something with a strong smell that your students might not be able to quickly identify – a small branch from a pine or eucalyptus tree is a good choice, coffee grounds or leaves from a tomato plant also work well, any thing with a strong smell. With the box open, walk among the students as quietly as possible. Have students point at where they think you are in the room. Have them open their eyes and see if they were correct (most should be).

- Ask students how they were able to tell you were there. The target answer is by smell. Ask students what part of their bodies does the smelling. Target answer: the nose.
- Explain to students that scent or smell, the ability to detect odors is a very important sense for humans. It tells us where food is located and when food is good to eat, whether or not water is clean enough to drink, it tells us when there are things near by (like poop) that can make us sick, it can even tell us if a parent or sibling is nearby. Our nose and its ability to smell are very important to human survival.
- Ask students to list their favorite smells and record them on the board. Ask them why they like the way they smell. This is a great opportunity to explain to students that smells are one of the most important memory triggers, your brain records the way things smell in very clear detail, and so when you smell that smell again, you might remember what was happening in clear detail as well. For example, when you smell fresh baked bread in the grocery store, your brain might connect that memory with the last time you were at your grandmother's house and she baked fresh bread.

Scent Exploration

Materials:

Up to 20 photo canisters with holes punched into the tops, each filled with one of the following items:*

lemon	*orange peel*	*cedar wood*	*pencil shavings*
banana	*pine needles*	*chocolate*	*coffee*
dirt	*vanilla*	*garlic*	*onion*
mint	*vinegar*	*moth balls*	*rose petals*
saw dust	*ginger*	*peppermint*	*jasmine flowers (or other fragrant flower)*

**Use your best judgment to determine how many your students can handle*

- Explain to students that they will have the opportunity to smell a variety of items and they will need to decide if they smell good or bad.
- Pass the containers around, one at a time and ask students to decide which items smell good or bad. On certain items, you will probably have a mix of opinions, just record the opinions without characterizing student's votes as right or wrong. When there are disagreements, ask students to explain why they think it smells good or bad.
- Next have students sort the smells into categories. They can pick the groupings. After they have all decided, explain that people often groups smells into five categories: floral, citrus, spicy, green, earthy. Have students see if their categories match the typical five.
- If multiple material sets and enough support staff are available, this works even better when done in small groups of students.

Scent Scavenger Hunt

- Have students undergo a scavenger hunt for things they can smell. You can choose smells in the classroom or on the playground. Another variation of this activity is to have children see how many different scents they can find in a given space.
- Make scratch and sniff cards by placing drops of scents onto index cards – essential oils or the items themselves can work. Have students work in pairs and give each group a card. Have the students sniff around the room until they can locate the item that is on their card. Variations: put the items the students are searching for into film canisters with holes poked into the lids. When they think they have matched their card to the canister, have them guess what the smell might be. This is also a good time to talk about strong scents and weak scents, asking students how easy or difficult it was to find their items. Explain that it is often easier to locate items with a strong smell than a weak one.

Hearing

Introduction to Hearing

- Start by having students close their eyes, if they are comfortable with that. Ask them if they can tell what is going on around them when they have their eyes closed. Many students will still answer no.
- Walk around the room making as much noise as possible – stomp, hum or whistle, clap your hands or snap your fingers, you can also use an instrument to make noise.
- Have students point at where they think you are in the room. Have them open their eyes and see if they were correct (most should be).
- Ask students how they were able to tell you were there. The target answer is by sound or noise. Ask students what part of their bodies hears the sounds or noises. Target answer: the ears.
- Explain to students that hearing, the ability to take in and interpret sound is a very important sense for humans. It can tell us where danger is (example: the rush of a waterfall, the roar of a train, the hum of a car motor), it can help us communicate, and in the past when we hunted for food, it helped us to find things to eat like birds and rabbits. Our ears and their ability to hear are very important to human survival.
- Ask students to list their favorite sounds on the board. Have them describe why they like them or don't like them.

Volume

- Explain to students that sounds can change in volume from very quiet to very loud.
- Have students demonstrate loud, quiet and in between volumes of talking, singing, clapping, stomping, or any other behavior you deem appropriate. See how quietly they can do something before they cannot hear it at all.
- Make a noise in the classroom of some sort loud enough to be heard by all students, but not so loud as to scare anyone. Open the door and repeat the sound in the hall while the students remain where they were. Ask students if it sounded the same both times. Target answer: No, it sounded quieter outside the classroom. Explain to the students that the volume at the initial point of the noise did not change, but that because it was farther away, it is harder for their ears to pick up the sound.
- Volume-Distance Variation: Have students pair up and pick a word to say to their partner. Next they need to walk away from their partner while saying the word at the same volume.

Pitch

- Explain to students that sounds can vary in pitch from low to high. Examples of low sounds include songs of blue whales, ship's whistles, tubas, and bass instruments (kettle drums, bass drums, bass fiddle, bass guitars, and bassoon). Examples of medium pitch sounds include clapping, most car horns, and instruments such as the trombone, trumpet, banjo, snare drum and symbols. Examples of high pitch sounds include the whistle of a tea kettle, beluga whale calls, dolphin whistles, the bells you ding for costumer service and instruments such as the triangle, violin, piccolo and clarinet.
- Play examples of high pitch, medium pitch, and low pitch sounds for the students. Many sound clips can be found at The Free Sound Project Website (www.freesound.org), while dolphin and whale calls can be found at www.dosits.org/gallery/intro.htm, and sound clips for a wide variety of animals, including an extensive bird call database can be found at animalbehaviorarchive.org.
- Have them repeat high, medium and low pitch sounds while humming and while singing.
- Sing or hum a note to your students and walk around the classroom while the students remain seated. Ask students if it sounds like your pitch is remaining the same as you walk around. Target answer: No, it sounds like the pitch is changing. Explain to the students that the pitch you were singing/humming did not change, but that because the note was moving relative to the position of our ears, it sounds different. A great example to reinforce this is a fire or police siren, which they have all heard going by.

- You can find examples of siren right at the source at www.freesound.org, and sirens with the Doppler effect on YouTube.com

Sound Scavenger Hunt

- Have students undergo a scavenger hunt for things they can hear. You can choose sounds in the classroom or on the playground. See if they can find the loudest and quietest sounds, sounds with the highest pitch and sounds with the lowest pitch.
- Another variation of this activity is to have children see how many different sounds they can find in a given space.

Music

- Explain that music is one of the ways that humans communicate with sound. We can communicate what we are feeling through sounds that we make.
- If your classroom has access to musical instruments, have students each pick one. If your classroom does not have access to musical instruments, have students make some (see the attached *Instruments Activity* for ideas).
- When all students have their instruments, encourage them to play them for a while. See if they can guess which instruments are high in pitch and which are low. If they are having trouble deciding, help them do so and make sure they know if they are high, medium or low pitched.
- Next have students see how loud they can play their instruments, then how softly they can play them.
- Have students explore expressing emotions through their instruments: have them play a sad sound (usually slow and soft), a happy sound (usually medium volume and brisk speed), an angry sound (loud and fast), a scary sound (loud and slow), a nervous sound (fast and soft), etc.
- As a class, write a piece of music with the instruments at hand. You can have students pick a favorite book or story and tell it through music, or maybe just have them describe a day in the classroom through their music. If students feel lost, play them some examples of music inspired by items or stories such as *Flight of the Bumblebees* by Nikolai Rimsky-Korsakov, *Peter and the Wolf* by Sergei Prokofiev, *Hoedown from Rodeo* by Aaron Copland, *Chariots of Fire* by Vangelis, to name a few - great clips of all of these are available on YouTube.
- If possible, have students perform their piece for an audience such as their parents, another class, a senior center, etc.

Sound Review

- With their bodies alone, or using musical instruments, have students make the loudest noises and the quietest noises. Have them make the highest pitch noises and the lowest pitch noises. Take this time to really assess your students' understanding of these topics and ensure they really comprehend the basics of hearing before you move onto to the next section.

Touch

Introduction to Touch

- Explain to students that touching or feeling things is one of the first senses we use as babies to understand the world.
- Ask them what part of their bodies they use to touch or feel things with. Target answer: hands.
- Ask them if their hands are the only part that can feel? Target answer: no.
- Explain that there are nerves under their skin all over their body that can feel or touch things, but that, as humans, we normally use our hands to feel things (at least once we stop putting things in our mouths as babies).
- Touch is another way we are able to learn about the world and protect ourselves from the dangers in it. We know that sharp or hot things can hurt us and we know that soft and fuzzy things make us feel good. Our skin, our hands, and our ability to touch are very important senses for humans.

Texture Exploration

Materials:

Rock	*Pillow*	*Sandpaper*	*Toothpick*
Piece of wood	*A metal baking dish*	*Tree bark*	*Stuffed Animal*

A piece of glass or mirror with the edges covered in tape

- Explain to students that they are going to be looking at texture today, or how the surface of something feels.
- Give students a chance to touch each item.
- Have them characterize the item as soft or hard, rough or smooth, sharp or flat. Talk about how some edges of an item can fall into one category while others into another – for example the toothpick is hard all over, but it is smooth on some edges and sharp on others.

Temperature Exploration

Materials:

**Three containers: paper, glass or plastic work best (ceramic insulates too well) – one filled with ice water, one with room temperature water, and one with hot water (but NOT boiling)*

**Thermometers – any kind will do, but the strip type thermometers are easier for young students to read (and are available for fairly low cost at Aquarium supply stores)*

**Temperature worksheets – one per group of 2-3 students*

**Crayons – one set of red, blue, pink, light blue, yellow per group*

- Explain to students that they are going to be exploring temperature today. Most students should have some concept of temperature already, but make sure that they know that temperature is something we can feel with our skin, and, when it comes to food and beverages, our mouths.
- Have students list different types of temperatures and record them on the board. Target answers: hot and cold. If students do not provide other answers, like cool and warm and some sort of neutral temperature, help lead them to those answers with prompting questions such as: "Can things only be hot or cold?" "Are you hot or cold right now?" As they provide these additional answers, record these too on the board.
- Next hold up the container with hot water, and explain to students that it is filled with hot water. Have them all touch the outside of the container to see if they agree if it is hot or not. If they don't agree, ask them why. Explain that you are going to measure the temperature of the container (or if you have a traditional thermometer, the water) and write down what the thermometer says one the board.
- Measure the temperature, write it down, and color a red dot or square next to this. Explain that red is normally the color associated with hot temperatures. Ask students why this might be.
- Repeat this process with the cold-water container, using a blue shape instead of a red; and again with the room temperature water, using yellow for the shape this time.
- Explain to students that they are going to explore temperatures of items around the room. They are going to work in teams of 2-3 (or whatever size you feel will work well with your class). One student will hold the paper, one will hold the thermometer, and one will hold the crayons. As they measure items around the room with the thermometer, they will need to color the box next to the item in the sheet red if it is hot, pink if it is warm, yellow if it is the same temperature as the rest of the room, light blue if it is cool, and blue if it is cold. Each member of the team will also need to touch the items with their hands to see if their hands agree with the thermometer (only give them this instruction if you feel your classroom doesn't contain any items that will be unsafe to touch), and when all members of the team agree that an item is a temperature, they will need to color the hand next to the item the appropriate color (red for hot, blue for cold, pink for warm, light blue for cool, yellow for neutral). Explain that there are blank spots for students to fill in with the item of their choice; they just need to draw a picture of the item they decide to measure in the blank spot. Give students a few minutes to explore and measure the temperature of items around the room.

- When students have had a chance to measure various items, have them regroup and review answers. Did all group members agree on their answers? Ask why different teams or different students might have different answers for the same items? This is a great opportunity to explain to students that this is why scientists have to repeat their experiments over and over again, to make sure that all scientists agree on an answer.
- This activity should conclude with a discussion of why we might want to know how hot or cold something is, the dangers of items that are too hot or too cold (burns, sunburns, frostbite, burned tongue, brain freeze, etc.).
- Activity Variation: Complete the activities as a class, giving different students a turn at picking something to measure the temperature of.

Shape Revisited

- Remind students that you talked about shape when covering vision. Ask students if they can also feel a shape. Target answer: yes.
- Have students put their hands into a box while not looking, and feel an item. Have them describe the shape, using terms like flat, round, square, star-shaped, etc. When they have all decided on a shape, bring the shape out of the box.
- Were they surprised about the item? Why or why not?
- You can repeat this with as many items as you see fit.

Tactile Scavenger Hunt

- Have students undergo a scavenger hunt for things they can touch and feel. You can choose textures and temperatures in the classroom or on the playground. See if they can find the softest and hardest, roughest and smoothest, hottest and coldest items.
- Another variation of this activity is to have children see how many different textures and temperatures they can find in a given space.
- Additional variation: tape or glue materials with a variety of textures to index cards (sand or sandpaper, cotton balls, a piece of smooth packing tape, different types of fabric, random packing materials all work very well). Give one card to each student or have students work in pairs to find a match in the classroom or schoolyard to the texture on their cards.

Taste

Introduction to Taste

- Ask students to name their favorite foods. List them on the board as they answer.
- Have them explain why an item is their favorite or not. Target answer: the taste
- Ask students to explain what part of the body lets them know if something tastes good or bad. Target answer: the tongue
- Explain to students that you are going to look at taste, and what it means.

Taste Exploration

Materials:

Cups or plates with items from each flavor category – see table below.

- If your school allows experiments with food, after checking for student food allergies, have your students explore the categories of taste: sweet, sour, savory, salty and bitter.
- See if students can come up with other terms for the flavors they experienced. Ask them which flavors they liked and which they did not like.

EXAMPLES OF FLAVORS				
Sweet	**Sour**	**Savory**	**Salty**	**Bitter**
Vanilla	Vinegar	Green beans	Soy Sauce	Mustard
Grape	Lemon	Peas	Cheese	Ginger
Honey	Grapefruit	Lentils	Nori	Unsweetened chocolate
Carrot	Lime	Potatoes	Seaweed	Almonds
Banana	Green Apples	Most meat	Sundried tomatoes	Rosemary
Poppy Seeds	Sour Patch Kids		Table Salt	Black Tea
Maple Syrup				Caraway Seeds
Milk				Cardamon
				Coffee

Most people don't notice the sweetness of milk; but if you taste water and then milk, the sweetness pops

- After snack or lunch, discuss flavors of the food with students. Have them list sweet things they ate, sour things they ate, salty things they ate, bitter things they ate, and savory things they ate. Record their answers on the board.

Homework – *Taking the lesson home*

As you progress through the lessons on different days, have students remember the first thing they see in the morning, the first thing they smell in the morning, the first thing they hear in the morning, and the first thing they taste in the morning. They can report their remembrance in a kind-of sense show and tell in class. To have students work on memory retention, you can also have them try and remember the last thing they smelled, the last thing they tasted (provides a great opportunity to focus on oral hygiene – i.e. toothpaste), the last thing they saw, the last thing they heard, and the last thing they smelled before they went to sleep the night before.

Evaluation

The evaluation in all of these lessons is formative. You will need to evaluate the students understanding of the topics as you progress through the lessons, spending more or less time on a section as needed by your students' comprehension.

Sensory Match Up

Materials:

Writing Utensil – one per student

Sense – Body Part Matching Worksheet – one per student

- Hand out the Sense-Body Part Matching Worksheet and show students how they need to match the body part that does the sensing to the item it can sense. Explain that there may me more than one correct answer for each body part, but they need to choose the body part that BEST matches. For example, you can touch a flower and see a flower, but what is coming out of the flower?
- Give them all the writing utensils and have them match the items.

What Part of Me Senses?

Materials:

Set of red, orange, yellow, green, blue crayons – one per student
What Part of Me? Worksheet – one per student

- Give students the What Part of Me? Worksheet. Explain to them that they will need to follow instructions as to how they need to color the parts of the body that sense.
- Tell the students to color the following:
  -Body part that sees blue
  - Body part that hears orange
  - Body part that touches or feels yellow
  -Body part that smells green
  -Body that tastes red
- Review the worksheets to make sure all students understand what body part is responsible for which sense.

Note:

If your classroom contains students whose senses are impaired, use this as an opportunity to explain that we are all different and this difference is not a bad thing. Make sure those students with the imparity do not feel left out of the activity by having them explain how they are experiencing the situation. While it may be hard for other students to understand the experience of another, they tend to be curious and understanding at this age.

Remember you are the expert with your students and what they are able to do. Use your best judgment as to which activities you feel your students can do.

Resources

Human Body for Children: All About the Senses. 2006. Schlessinger Science Library. DVD: ASIN: B000OIP42W. VHS: ISBN: 1572254262
This video provides a lot of good information about senses, presented in a clear, child-friendly manner. It does suggest a variety of activities for students to undertake to better understand their senses.

Aliki. *My Five Senses*. 1989. HarperTrophy. ISBN-10: 006445083X. ISBN-13: 978-0064450836.
A good picture book about the five senses.

Isadora, Rachel. *I touch*. 1985. Greenwillow Books. ISBN: 0688042562.
A great basic story book about touch.

Jenkins, Steve. *Living Color*. 2007. Houghton Mifflin Company. ISBN-10: 0-618-70897-9. ISBN-13: 978-0-618-70897-0.
A text-heavy, but visually stunning book about color in the natural world.

MacDonald, Suse. *Sea Shapes*.
Hardback: 1994. Harcourt Books. ISBN-10: 0152000275, ISBN-13: 978-0152000271
Paperback: 1998. Voyager Publishing. ISBN-10: 0152017003, ISBN-13: 978-0152017002
A book looking for familiar shapes in the ocean.

Peck, Jan and Valeria Petrone (illustrator). *Way Down Deep in the Deep Blue Sea*. Simon & Schuster Children's Publishing. ISBN-10: 0689851103, ISBN-13: 978-0689851100
A book with nice rhythm exploring some basic ocean animals.

Rose, Deborah Lee and Steve Jenkins (illustrator). *Into the A, B, Sea*. 2000. Scholastic Press. ISBN-10: 0-439-09696-0, ISBN-13: 978-0439096966
An ocean alphabet book.

Rotner, Shelley. *Senses at the Seashore*. 2006. Millbrook Press. ISBN: 0761328971.
A great book to introduce students to both the seashore and their senses.

Simon, Seymour. *Eyes and Ears*. 2005. HarperTrophy. ISBN-10: 0060733020. ISBN-13: 978-0060733025
A good book for teachers to learn more about how eyes and ears work.

Wood, Audrey and Bruce Wood (illustrator). *The Deep Blue Sea: A Book Of Color*s. 2005. The Blue Sky Press. ISBN-10: 0439753821, ISBN-13: 978-0439753821
A very basic storybook about colors with an ocean theme.

Ziefert, Harriet and Amanda Haley (illustrator). *You Can't Taste A Pickle With Your Ear*. 2006. Blue Apple Books. ISBN-10: 1593541724. ISBN-13: 978-1593541729.
A good book about the senses, packed with information – might want to read to students one sense at a time.

Supplemental Materials

The Deep Blue Sea Coloring Page

Name:

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