

Standard

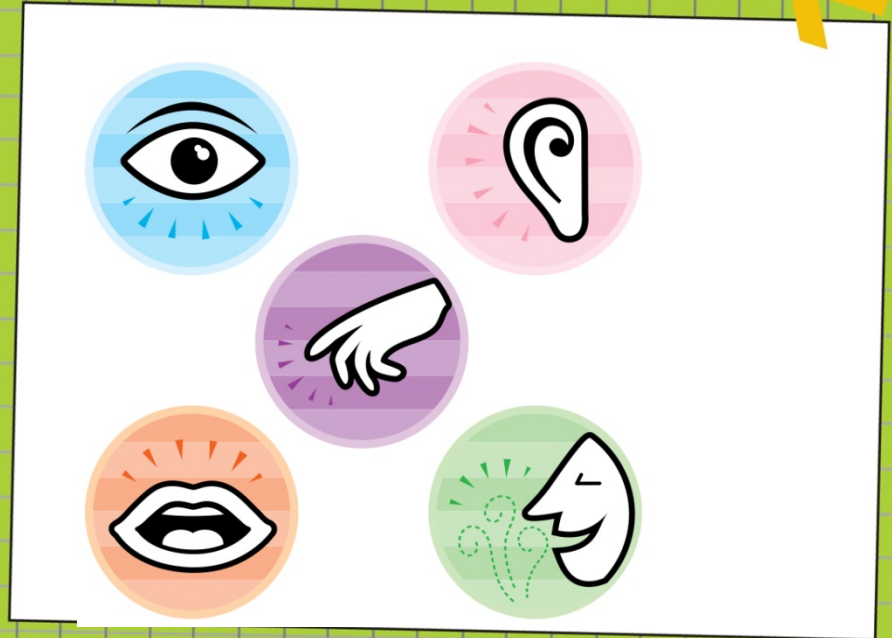
CT – 5.2 - Perceiving and responding to information about the environment is critical to the survival of organisms.
MA – Life Science (Biology) Gr. Pre-K-2, #6; Gr. 6-8 #13

Making Sense of Your Senses

Connecticut

Science

Center



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Updated: February 2011



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CT Science Standard 5.2- Senses

Perceiving and responding to information about the environment is critical to the survival of organisms.

Summary

This program provides you and your students with materials related to the topic of Senses. During your visit, your students will enjoy opportunities to make observations, raise questions, and learn more about the five senses in one of our Discovery Center classrooms.

In addition, your students will explore the various galleries, including the Sight and Sound Experience.

Also included in this program are lessons that provide interdisciplinary connections, as well as additional resources such as websites, literature links, career information, home and school connections, and related videos.

This program was supported by **Connecticut Health and Educational Facilities Authority (CHEFA)**. During the visit at the Connecticut Science Center students will complete activities related to specific health careers and videos of health professionals in those particular fields of interest will be shared with the students.

This program has been developed to complement some of the core themes, content standards and expected performances of the CT Core Science Frameworks, as well as the National Science Education Standards. It includes a visit to the science center which includes “hands-on” investigations that are inquiry-based and designed to engage students as well as to enhance and build upon their prior content knowledge. It may be integrated with other subjects or it may be taught in its entirety within the science classroom.

The complete CT Core Science Curriculum Frameworks is available at the website http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/science/PK8_sciencecurriculumstandards2009.pdf. See also: American Association for the Advancement of Science, *Atlas of Science Literacy*, and Project 2061. In addition, Grade Level Content Standards were released in June, 2007, to “unpack” the science content for grades K-5. This program will focus on the Senses. The original science frameworks were designed to give teachers an idea of what students *should know*. Grade Level Expectations were added in July, 2008, to further “unpack” the science concepts to give an idea of what students *should be able to do*. This gives teachers an idea of what sorts of activities are appropriate to do with students, and even some ideas as to what sorts of questions can reasonably be expected to appear on the CMT.

Following are the specific sections from the CT Core Science Curriculum Framework that are addressed in this unit. The B INQ information reflects the process skills intended for grades 3-5 specifically representing the content standards of scientific inquiry, literacy, and numeracy.

Inquiry Standards

Content Standards	Expected Performances
<p>SCIENTIFIC INQUIRY</p> <ul style="list-style-type: none"> ◆ Scientific inquiry is a thoughtful and coordinated attempt to search out, describe, explain and predict natural phenomena. <p>SCIENTIFIC LITERACY</p> <ul style="list-style-type: none"> ◆ Scientific literacy includes speaking, listening, presenting, interpreting, reading and writing about science. <p>SCIENTIFIC NUMERACY</p> <ul style="list-style-type: none"> ◆ Mathematics provides useful tools for the description, analysis and presentation of scientific data and ideas. 	<p>B INQ.1 Make observations and ask questions about objects, organisms and the environment.</p> <p>B INQ.2 Seek relevant information in books, magazines and electronic media.</p> <p>B INQ.3 Design and conduct simple investigations.</p> <p>B INQ.4 Employ simple equipment and measuring tools to gather data and extend the senses.</p> <p>B INQ.5 Use data to construct reasonable explanations.</p> <p>B INQ.6 Analyze critique and communicate investigations using words, graphs and drawings.</p> <p>B INQ.7 Read and write a variety of science-related fiction and nonfiction texts.</p> <p>B INQ.8 Search the Web and locate relevant science information.</p> <p>B INQ.9 Use measurement tools and standard units (e.g., centimeters, meters, grams, kilograms) to describe objects and materials.</p> <p>B INQ.10 Use mathematics to analyze, interpret and present data.</p>

CT Science Standards, Grade Level Concepts & Expectations, & CMT Correlation

<i>Structure and Function -How are organisms structured to ensure efficiency and survival?</i>			
GRADE 5			
5.2 Perceiving and responding to information about the environment is critical to the survival of organisms.			
Core Science Curriculum Framework	Underlying Concepts <i>Students should understand that...</i>	Grade-Level Expectations <i>Students should be able to...</i>	CMT Expected Performances
<p>5.2.a The sense organs perceive stimuli from the environment and send signals to the brain through the nervous system.</p>	<ol style="list-style-type: none"> 1. Animals have sense organs that are structured to gather information about their environment. Information perceived by the senses allows animals to find food, water, mates and protection. 2. Each sense organ perceives specific kinds of stimuli. Some human senses are more or less developed than the senses of other animals. 3. Sense organs transfer information through a network of nerves to the brain where it is interpreted and responded to. The brain responds by sending messages to all parts of the body. The type of response and the amount of time it takes for the response to occur vary depending on the stimulus. 4. The human ear is structured to collect sound vibrations from the environment and pass them through the middle ear (eardrum and small bones) and inner ear (hair-lined tubes) to the auditory nerve where they are transformed into electrical signals that are sent to different parts of the brain. 5. The human eye is structured to collect light through the cornea and the pupil. The amount of light that enters the eye is controlled by the iris. The cornea and the lens refract the light and focus it onto the retina and the optic nerve where it is transformed into electrical signals that are sent to different parts of the brain. 6. For anything to be visible, light must be present. For a person to see an object, the light it reflects or produces must have a straight, unobstructed path to the eye. 7. Human eyes have receptors for perceiving shades of red, orange, yellow, green, blue, indigo and violet. 8. Sunlight (or "white light") is a combination of colors. White light passed through prisms, water droplets or diffraction gratings can be refracted to show its component colors: red, orange, yellow, green, blue, 	<ol style="list-style-type: none"> 1. Explain the role of sensory organs in perceiving stimuli (e.g., light/dark, heat/cold, flavors, pain, etc.) 2. Pose testable questions and design experiments to determine factors that affect human reaction time. 3. Conduct simple tests to explore the capabilities of the human senses. 4. Summarize nonfiction text to explain the role of the brain and spinal cord in responding to information received from the sense organs. 5. Identify the major structures of the human eye, ear, nose, skin and tongue, and explain their functions. 6. Draw diagrams showing the straight path of light rays from a source to a reflecting object to the eye, allowing 	<p>B20. Describe how light absorption and reflection allow one to see the shapes and colors of objects.</p> <p>B21. Describe the structure and function of the human senses and the signals they perceive.</p>

CT Science Standard 5.2- Senses

Perceiving and responding to information about the environment is critical to the survival of organisms.

	<p>indigo and violet.</p> <p>9. The perceived color of an object depends on the color of the light illuminating it and the way the light interacts with the object. The color humans see is the color that is reflected by the object. For example, an object that appears green is absorbing all colors except green, which is reflected to the eye.</p> <p>10. Human skin is structured to detect information related to texture, temperature, pressure and vibration. Each sensation has different receptors distributed around the body; some areas of the body have greater concentrations of receptors for certain sensations, making those areas more sensitive than others to texture, temperature, or pressure.</p> <p>11. Human noses are structured to collect and detect chemicals floating in the air (odors). Tiny hairs behind the nose have special receptors that respond to airborne chemicals and produce electrical signals that are transmitted to different parts of the brain by the olfactory nerve.</p> <p>12. Human tongues are sense organs that are structured for detecting chemicals dissolved in saliva (flavors). Taste buds respond to 4 basic tastes: salty, sweet, sour and bitter. Special receptors in taste buds respond to tastes and produce electrical signals that transmit information through nerves to different parts of the brain.</p> <p>SCIENTIFIC LITERACY TERMINOLOGY: sense organ, receptor, stimulus, response, nervous system, vibration, reflect, refract, cornea, pupil, iris, lens, retina, white light, absorb</p>	<p>objects to be seen.</p> <p>7. Describe the properties of different materials and the structures in the human eye enable humans to perceive color.</p>	
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CT Science Standard 5.2- Senses

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Massachusetts Learning Standards

Life Science (Biology)

Grades PreK-2

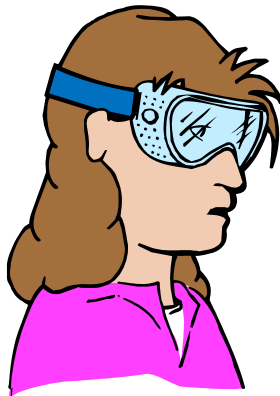
6. Recognize that people and other animals interact with the environment through their senses of sight, hearing, touch, smell, and taste.

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Safety Standards

- Review expectations for appropriate behavior, handling of materials, and cooperative group procedures to be sure those activities are accessible and safe for all students prior to beginning these investigations.
- Make any necessary student modifications.
- Monitor students to be sure they are acting appropriately, handling materials accordingly, and working cooperatively especially when working with the glass bottles and striking objects to make sounds
- For more comprehensive information on science safety, consult the following guidelines from the Council of State Science Supervisors; Connecticut Department of Education http://www.csss-science.org/downloads/scisaf_cal.pdf



Misconceptions and Facts

General Misconceptions about Sound and Hearing

Misconceptions	Facts
Loud sound is not dangerous, as long as you don't feel any pain in your ears.	Our threshold for pain is at about 120 - 140 dB SPL but sound begins to damage our hearing when it is above 85 dB SPL (for an 8 hour period).
Hearing loss after sound exposure is temporary.	Some of the hearing loss will be permanent. Indication of damage is ringing and noise in the ears (called tinnitus) after sound exposure. This is a clear indication that sound exposure took place. Another indication of that is the difficulty to communicate on the phone and in the noisy restaurant or cafeteria.
If you have a hearing loss already, you don't have to protect your hearing any more.	Hearing loss accumulates. More exposure to loud sounds leads to more hearing loss.
Hearing loss is mostly caused by aging.	Research shows that accumulative exposure to loud sounds, not age, is the major cause of hearing loss.
Hearing loss can be repaired by medicine, surgery or hearing aids.	Although certain improvements can be obtained by the use of hearing aids. In the case of hearing losses inflicted due to the noise exposure, the resulting quality of hearing will be far from normal. So far no drugs or therapy can correct noise induced hearing loss. This could affect your professional performance as a musician, sound engineer, medical doctor, air traffic controller, telephone operator, pilot and driver or in any other profession where performance depends on good hearing. Also, your enjoyment of music would suffer.
Loud sound only damages your hearing.	Loud sound can change your heart rate, vision and reaction time. It may make you more aggressive and in general, negatively affect you.

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Common Misconceptions about Sight Loss

Misconceptions	Facts
All blind people are totally blind.	There is a wide spectrum of sight loss among people who are legally blind, ranging from slight impairment of vision all the way to total blindness. Only about 10 percent of legally blind people are totally blind. The majority of people who are blind have some degree of vision remaining.
Legal blindness means total blindness.	Legal blindness is a term used by the IRS and other agencies to determine whether a person is eligible for disability benefits or other services. Legal blindness does not necessarily mean total blindness. You are considered legally blind if the central vision in your better eye, with the best correction possible, is no better than 20/200 (20/20 being normal); or if your peripheral vision is no greater than 20 degrees diameter in your better eye.
All blind people can read Braille.	Only about 10 percent of people who are blind or visually impaired can read and write Braille.

Source of list of misconceptions: <http://amasci.com/miscon/miscon.html>

in conjunction with Operation Physics American Institute of Physics 1825 Connecticut Ave. NW, Suite 213 Washington, DC 20009 (202) 232-6688 <http://www.aip.org>

Additional research about misconceptions was found at:

<http://www.project2061.org/publications/bsl/online/ch15/findings.htm#Ch5>

CT Science Center Classroom Visit Activity

The following highlighted GLCs and GLEs are covered in this section:

<i>Structure and Function -How are organisms structured to ensure efficiency and survival?</i>			
GRADE 5			
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	<p>diffraction gratings can be refracted to show its component colors: red, orange, yellow, green, blue, indigo and violet.</p> <p>9. The perceived color of an object depends on the color of the light illuminating it and the way the light interacts with the object. The color humans see is the color that is reflected by the object. For example, an object that appears green is absorbing all colors except green, which is reflected to the eye.</p> <p>10. Human skin is structured to detect information related to texture, temperature, pressure and vibration. Each sensation has different receptors distributed around the body; some areas of the body have greater concentrations of receptors for certain sensations, making those areas more sensitive than others to texture, temperature, or pressure.</p> <p>11. Human noses are structured to collect and detect chemicals floating in the air (odors). Tiny hairs behind the nose have special receptors that respond to airborne chemicals and produce electrical signals that are transmitted to different parts of the brain by the olfactory nerve.</p> <p>12. Human tongues are sense organs that are structured for detecting chemicals dissolved in saliva (flavors). Taste buds respond to 4 basic tastes: salty, sweet, sour and bitter. Special receptors in taste buds respond to tastes and produce electrical signals that transmit information through nerves to different parts of the brain.</p> <p>SCIENTIFIC LITERACY TERMINOLOGY: sense organ, receptor, stimulus, response, nervous system, vibration, reflect, refract, cornea, pupil, iris, lens, retina, white light, absorb</p>	<p>of the human eye, ear, nose, skin and tongue, and explain their functions.</p> <p>6. Draw diagrams showing the straight path of light rays from a source to a reflecting object to the eye, allowing objects to be seen.</p> <p>7. Describe the properties of different materials and the structures in the human eye enable humans to perceive color.</p>	
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Making Sense of Your Senses



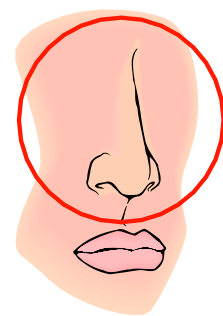
Intro:

In this class we will focus on why we need the five senses. Students will be introduced to all five senses by completing various activities that make them think about how they interact with their environment. As students complete activities they will record their observations and questions in their science notebook. Once each activity is completed we will discuss what they noticed as a class and how that particular sense or senses were affected during the activity. The particular sense of interest is then linked to a specific health career and a video is shown related to that particular medical professional. (For example, when we experience what it means to be colorblind in one of our activities, a video of an Ophthalmologist is shown as this particular health professional would assist you with that particular medical concern.)

Part 1 (10 minutes)

Making Sense of Scents-

This classroom activity allows students to explore different types of scents. We will have 6 different scents in different numbered containers placed around the room. Each group will have 3 containers at their lab table for a total of 30 containers in the room. Students will choose one container off their table. They will try to guess what particular scent they have in their container. They will need to explore the classroom and try to match up their scent. When they believe they have determined it they will go to a marked area in the classroom where they will find the group that shares that scent. They will determine which numbered containers have which scents. We will have coffee beans available in cups around the room to clear their nasal palate between testing. They will be shown the technique of "wafting" before the activity begins as a safety precaution. Students will be given a 5 minute time limit. The scents will be orange, spearmint, vanilla, lavender, strawberry, and lemon. At the end of the time we review the different group decisions and will reveal the correct



The Nose

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answers. This activity shows the differences in sensitivity of the sense of smell from one person to another.

This part of the class focuses more on **smell**, but also includes **taste**.

After the activity we will discuss what the class noticed during their experience and we will also discuss how the sense of smell and taste are related. Did you choose the right scent? What did you notice about the different scents? What are you wondering?

Teacher notes:

Have you ever lost your sense of smell when you have a cold? Have you also ever wondered why food loses its flavor when you have a cold? -It's not your taste buds' fault. Blame your stuffed-up nose. Seventy to seventy-five percent of what we perceive as taste actually comes from our sense of smell. Taste buds allow us to perceive only bitter, salty, sweet, and sour flavors. It's the *odor molecules* from food that give us most of our taste sensation.

When you put food in your mouth, odor molecules from that food travel through the passage between your nose and mouth to *olfactory* receptor cells at the top of your nasal cavity, just beneath the brain and behind the bridge of the nose. If mucus in your *nasal passages* becomes too thick, air and odor molecules can't reach your olfactory receptor cells. Thus, your brain receives no signal identifying the odor, and everything you eat tastes much the same. You can feel the texture and temperature of the food, but no messengers can tell your brain, "This cool, milky substance is chocolate ice cream." The odor molecules remain trapped in your mouth. The pathway has been blocked off to those powerful perceivers of smell--the olfactory bulbs.

The students will view a video related to the sense of smell once we have discussed our noticing and wonderings.

Video (2 minutes)

<http://www.youtube.com/watch?v=wjRsa77u6OU>

If you lost your sense of smell, called anosmia, you would want to visit an ENT (Ear, Nose and Throat physician) who would give you some tests to see why you could not smell.

Teacher's notes:

(Anosmia is the absence of the sense of smell. Smell loss can be partial or complete, and can be a result of an injury, illness, or can be congenital. People with a normal sense of smell confuse the sensations given to them by their tongue (sweet, salty, etc.) with those they detect using their nose. So, people with anosmia also have a limited sense of what many people would regard as taste.)

One test he could give you might be a nasal endoscopy so you can see if there is a blockage in your sinuses.

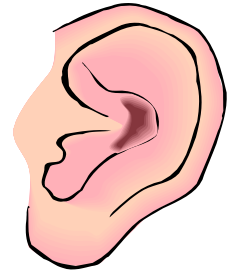
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Part 2 (7 minutes)

How Can You Match Things Without Seeing Them?

This classroom activity will focus on hearing. Students (groups of 2-3) are given various dark tubes with different items in them including beans, small erasers, thumbtacks and buttons. They are provided with two tubes of each item mixed up in front of them. We announce the name of the items. They shake them one at a time to find matching pairs. Once they have matched up the sounds they can try to guess which items are in which tubes. They are given a three minute time limit. They make their final decisions as a group and then open up the canisters to see how many they got correct. We discuss what they noticed individually and as a class. Which items were the easiest to match? Why? We frequently classify things according to visual characteristics. This activity requires the use of the sense of **hearing** alone in matching pairs of cans containing identical items.



The Ear

The students will view a video related to the sense of hearing once we have discussed our noticings and wonderings.

Video (2 minutes) Audiologists are trained to diagnose, manage and/or treat hearing or balance problems

<http://www.youtube.com/watch?v=3tjovzqTNCs>

Part 3 (7minutes)

Choose Your Colors

This activity is related to the sense of sight. Students will have 6 different color buttons in a container and 6 different names of colors listed on a paper in front of them. They are told they will have 1 minute to place the different color buttons onto the circle on the paper under the correct color. For example, they will need place the red button onto the circle labeled red. Before we start the activity we tell them there is one catch, we are going to turn the regular lights off but they will be able to turn on a special light. (Labeled with a red sticker) We turn off the lights and they turn on a red light. Students will not be able to see the differences in the colors very well. We then turn on the light in the room and see what they got correct. We then repeat the activity using a blue light. (Labeled with a blue sticker)



We discuss what they noticed. Was it difficult to see the colors? Was it easier to see the colors of the buttons with the red light or the blue light? What are you wondering? After their ideas are discussed we introduce the topic of colorblindness and we complete a color vision test online.

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On-line color vision test (2 minutes) – to test for color-blindness. If you suspect you cannot see different colors your ophthalmologist may send you for a color vision test.

<http://colorvisiontesting.com/online%20test.htm#demonstration%20card>

Once they have experienced what it means to be colorblind, they will view a video of a health professional that would help you with that particular medical concern:

Video of Ophthalmologist, Nancy Chew (3 min)

<http://science.education.nih.gov/LifeWorks.nsf/Interviews/Emily+Chew>

Possible Additional Activity- this activity may be substituted for one of the previous activities if students are at a lower grade level.

Why Do We Need the Five Senses?

This is a classroom activity exploring four different tubes of substances- salt (labeled #1), granulated sugar (labeled #2), powdered sugar (labeled #3), and flour (labeled #4). Students are blindfolded and feel the contents of each tube. They make observations without their sense of sight. They are told that these are items they may find in their kitchen at home. Students record what they think the substances are while they are blindfolded. They do not announce it out loud. Now allow the students to now look at the tubes and record what they think it is with their sight only. After they have recorded based on touch and sight, identify the substances. What did they notice about their choices before they could see the substances and then after they were able to view them?

This activity should emphasize that the senses are interdependent. Discuss that everything we learn is learned through the use of the five senses-frequently a combination of two or more of them. Also discuss how we rely on what we have already learned-information stored in the brain.

For this activity there are maximum of 10 groups of 2-3 students. The tubes are shared within the group and moved from student to student.

Science skills: observing, inferring, classifying, predicting, communicating, comparing and contrasting

This part of class focuses more on **touch and sight**. Once this activity is completed they could then view a video related to the sense of sight.

Video (3min) Sight is one of our most important senses- show the video of the optometrist vs. ophthalmologist vs. optician (run till 3:05)

<http://www.youtube.com/watch?v=igpejGDmtcE>

Wrap- Up- (5 min) Discuss all five senses we used during class. What do they feel is the most important sense? All are important to our interaction with our environment. There are hundreds of health careers related to the senses that they can explore.

Additional materials:

*The following images are placed in placards around the room during Part 1 so that students have a labeled location to meet.

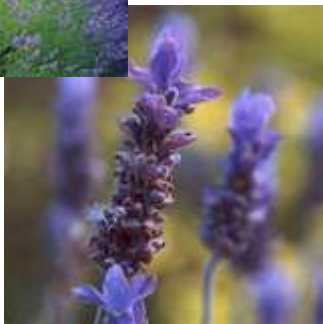
Spearmint



Orange



Lavender



Lemon



Strawberry



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*Worksheets for Part 3 – Students place their buttons on the circles during the activity and can check off under each circle if they are correct as they complete each trial with the red and blue lights.

Brown Red Orange Yellow Green Blue



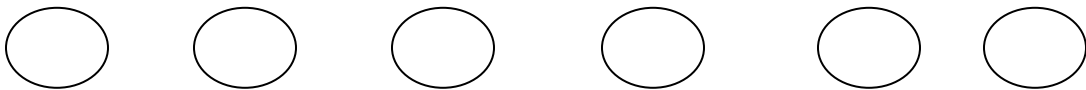
Trial 1 ----- ----- ----- ----- ----- -----
Trial 2 ----- ----- ----- ----- ----- -----

Brown Red Orange Yellow Green Blue



Trial 1 ----- ----- ----- ----- ----- -----
Trial 2 ----- ----- ----- ----- ----- -----

Brown Red Orange Yellow Green Blue



Trial 1 ----- ----- ----- ----- ----- -----
Trial 2 ----- ----- ----- ----- ----- -----

Putting Science To Work In Connecticut – Health

Teacher Trail Guides

(Information regarding these OWC kiosks can be found in the Career section)

OWC Teacher Trail Guide

Putting Science to Work in Connecticut

Visit the **Picture of Health Gallery** on the 5th floor
Find the Putting Science to Work in Connecticut video kiosk

View the two videos filmed at the following locations in the State of Connecticut:

Mount Sinai Rehabilitation Hospital, a SAINT FRANCIS Care Provider
Ahlstrom Nonwovens LLC

Please answer the following questions related to each video:

Mount Sinai Rehabilitation Hospital, a SAINT FRANCIS Care Provider

What is a Lokomat? What is it used for and how could it help a patient?

Ahlstrom Nonwovens LLC

What is a Nonwoven composite? Why is it important to maintaining good health?

What health careers are included in these videos?

There are many people that live and work in our State of Connecticut that contribute to keeping us healthy in our communities.

Have you ever thought about pursuing a health related career in the future?

Teacher notes:

A Lokomat is advanced robotic therapy equipment that is able to train stroke damaged brains to regain control over their bodies. It allows people to recover and improve their lives. Patients basically relearn how to walk. Not only stroke victims but patients with spinal cord injuries and MS patients are now using this technology.

A nonwoven composite is a web of material- synthetic material is compressed into a sheet. It is a breathable viral barrier. Specialized plastics are used to create the non-woven, multi-layered materials which allow air and moisture to pass through, but block the passage of bacteria and even viruses. These materials are used in hospitals to protect both the patients and medical staff from potentially deadly contamination.

Physical therapist and Product Development Scientist are the careers seen in the videos.

Sponsored by State of Connecticut Office for Workforce Competitiveness

Putting Science To Work In Connecticut – Health Student Trail Guides

OWC Trail Guide

Putting Science to Work in Connecticut

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Have you ever thought about pursuing a health related career in the future?

5th Floor!

Making Sense of your Senses*

Correlations with Gallery Programs:

The following Gallery Experiences complement this lesson. They are featured in our Body Lab located on Level 5 in the Picture of Health Gallery.

Eye Anatomy with Cow Eye Dissection

(Grades 5-8)

View demonstration of a cow eye dissection. Eye organ structures are compared to a human eye model and a camera.

Can You Hear Me Now?

(Grades 5 to 8)

Hands on ear examination of a life size human ear simulator using authentic medical equipment. Learn and perform procedures of proper ear care and maintenance.

Health Care Careers: Nursing and EMT

(Grade Level 5-12)

Employ hands-on nursing and first responder life-saving techniques using medical simulation technology. Assessment of vital signs in both real humans and a medical human simulator.

**If you wish for your students to take advantage of this Gallery Science program, you must make arrangements with a Gallery Scientist 30 days prior to your visit. For more information please contact Gallery Scientist Joanna Correa at jcorrea@ctsciencecenter.org*



CT Science Standard 5.2- Senses

Perceiving and responding to information about the environment is critical to the survival of organisms.

Teacher Resources

Safety Disclaimer:

The content of this Teacher's Resource section is intended to serve as an educational resource for teachers and students.

Preparing for the safety of yourself and your students is a critical step in planning for any hands-on science-related activities. Prior to conducting any of the activities included in this resource section, please familiarize yourself and your students with any potential hazards, and take the necessary precautions appropriate for each specific activity.

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Background for the Teacher

What are the senses?

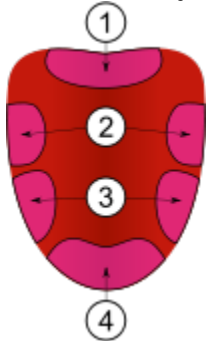
Senses are the physiological capacities within organisms that provide inputs for perception. The senses and their operation, classification, and theory are overlapping topics studied by a variety of fields, most notably neuroscience, cognitive psychology (or cognitive science), and philosophy of perception. The nervous system has a specific sensory system or organ, dedicated to each sense.



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Human body and Health misconceptions



An incorrect map of the tongue showing zones which taste bitter (1), sour (2), salty (3) and sweet (4). In reality, all zones can sense all tastes.

- Different tastes can be detected on all parts of the tongue by taste buds, with slightly increased sensitivities in different locations depending on the person, contrary to the popular belief that specific tastes only correspond to specific mapped sites on the tongue. The original tongue map was based on a mistranslation by a Harvard psychologist of a discredited German paper that was written in 1901.
- People do not use only ten percent of their brains. While it is true that a small minority of neurons in the brain are actively firing at any one time, the inactive neurons are important too. This myth has been commonplace in American culture at least as far back as the start of the 20th century, and was attributed to William James, who apparently used the expression metaphorically. Some findings of brain science (such as the high ratio of glial cells to neurons) have been mistakenly read as providing support for the myth.
- There is no single theory that satisfactorily explains myopia—in particular, studies show that so-called eyestrain from close reading and computer games can lead to myopia, but the underlying physiologic mechanism is poorly understood. There is also no evidence that reading in dim light or sitting close to a television causes vision to deteriorate.

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Professional Development

Field Trip Professional Development Workshop

Come be a student for a day! Prior to bringing your class to the CT Science Center, you are encouraged to spend time at the Center and explore the exhibits and programs available to you and your students by participating in our two day Field Trip Professional Development Workshop.

During these two days, you will have an opportunity to explore the Sight and Sound Gallery, the Health and Sports Gallery, and other relevant galleries using our standards based Trail Guides. These guides will lead you and your students on the pathway toward enjoying the museum while maintaining focus on your grade level or content standard.



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Interdisciplinary Extensions

Senses

Language Arts

Sensory Poems-

http://kiwiyert.tripod.com/sensory_poems.htm

Art

Art lessons for all grade levels-

http://www.princetonol.com/groups/iad/lessons/categorized_lessons.html

Technology

New technology that measures brain waves-

<http://www.neurosky.com>

CT Science Standard 5.2- Senses

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Teacher Websites

Teacher Planet- Main page of activities related to the five senses:

<http://www.teacherplanet.com/resource/senses.php>

Alphabet Soup-Five Senses Activities-

<http://www.alphabet-soup.net/me/senses.html>

Exploratorium-Sense of Taste Activity-

http://www.exploratorium.edu/snacks/your_sense_of_taste/

CT Science Standard 5.2- Senses

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Literature Links

Teacher Resources:

Berger, Gilda. Teaching Guide: See, Hear, Touch, Taste, Smell. 1993. Newbridge Early Science Program.

Martin, Paul D. Messengers to the Brain: Our Fantastic Five Senses. 1988. National Geographic Society. Washington, D.C. ISBN: 0-87044-499-9.

Levenson, Elain. Teaching Children about Science. 1985. Prentice Hall, Inc. Englewood Cliffs, NJ. (ISBN: 0-13-891730-2)

Poppe, Carol A., and Nancy A. Van Matre. Science Learning Centers for the Primary Grades. 1985. The Center for Applied Research in Education, Inc. West Nyack, NY. (ISBN: 0-87628-749-6)

CT Science Standard 5.2- Senses

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Videos

Ear, Nose and Throat Physician (ENT)-

<http://www.youtube.com/watch?v=wjRsa77u6OU>

Nasal Endoscopy-

<http://www.youtube.com/watch?v=wjRsa77u6OU> (shown to students per age level and teacher discretion)

Audiologist- <http://www.youtube.com/watch?v=3tjovzqTNCs>

On-line color vision test- <http://colorvisiontesting.com/online%20test.htm#demonstration%20card>

Ophthalmologist, Dr. Nancy Chew-

<http://science.education.nih.gov/LifeWorks.nsf/Interviews/Emily+Chew>

Optometrist vs. Ophthalmologist vs. Optician -

<http://www.youtube.com/watch?v=igpejGDmtcE>



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Classroom Kits

Catalogs for Teachers-extensive listing of catalogs that include classroom kits related to the senses

[http://www.catalogs4teachers.com/?_utma=1.102936767.1281458472.1281458472.1281458472.1&_utmb=1.4.10.1281458472&_utmc=1&_utmz=1.1281458472.1.1.utmcsr=bing|utmccn=\(organic\)|utmcmd=organic|utmctr=teacher%20resources%20for%20senses&_utmv=-&_utmh=19381688](http://www.catalogs4teachers.com/?_utma=1.102936767.1281458472.1281458472.1281458472.1&_utmb=1.4.10.1281458472&_utmc=1&_utmz=1.1281458472.1.1.utmcsr=bing|utmccn=(organic)|utmcmd=organic|utmctr=teacher%20resources%20for%20senses&_utmv=-&_utmh=19381688)

CT Science Standard 5.2- Senses

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Software

The websites that have been listed in this package provide interactive learning activities (for free). Students are able to engage with these resources, and no additional software is required.

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Home/School/Community Connection

- Students could write newsletters home describing their experience at the CT Science Center and what they've learned about the senses.
- Ask for parent volunteers to chaperone the trip to the CT Science Center.
- Invite different health professionals into your classroom to speak to the class about their careers.

Careers in Senses

Audiologist - assesses and treats persons with hearing and related disorders, also counsels in strategies to improve speech or hearing impairment and ways to protect our hearing.

ENT- Otolaryngology or ENT (ear, nose and throat) is the branch of medicine that specializes in the diagnosis and treatment of ear, nose, throat, and head and neck disorders. The full name of the specialty is otolaryngology-head and neck surgery. Practitioners are called otolaryngologists-head and neck surgeons.

Ophthalmologist - Ophthalmology is the branch of medicine which deals with the anatomy, physiology and diseases of the eye. The term ophthalmologist refers to a specialist in medical and surgical eye problems. Since ophthalmologists perform operations on eyes, they are considered to be both surgical and medical specialists.

Optometrist- Optometrists, also called doctors of optometry (O.D.) diagnose and treat vision problems, eye diseases and related conditions, and prescribe eyeglasses, contact lenses, and medications to treat eye disorders. They cannot perform surgery, but they often provide patients with pre- and postsurgical care. Sometimes ophthalmologists and optometrists work in the same practice and co-manage patients.

Optician- An optician is a health care practitioner who designs, fits and dispenses lenses for the correction of a person's vision.

Endoscopy Technician -an Endoscopy Technician is an integral member of the Endoscopy team who provides support for physicians and RN's throughout endoscopy procedures by preparing, providing and caring for instruments and equipment, obtaining specimens, and maintaining a sterile field where applicable.

*Putting Science to Work in Connecticut STEM Career Video Kiosks
(Trail Guides have been provided within this package for your students to explore these kiosks)*

Putting Science to Work in Connecticut -Health

Mount Sinai Rehabilitation Hospital, a SAINT FRANCIS Care Provider

Advanced Robotic therapy equipment is able to train stroke damaged brains to regain control over their bodies and allow people to recover and improved their lives.

Ahlstrom Nonwovens LLC

Specialized plastics are used to create non-woven, multi-layered materials which allow air and moisture to pass through, but block the passage of bacteria and even viruses. These materials are used in hospitals to protect both the patients and medical staff from potentially deadly contamination.

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Student Resources

Safety Disclaimer:

The content of this Student's Resource section is intended to serve as an educational resource for students.

Preparing for the safety of yourself is a critical step in planning for any hands-on science-related activities. Prior to conducting any of the activities included in this resource section, please familiarize yourself with any potential hazards, and take the necessary precautions appropriate for each specific activity.

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Student Websites

ORACLE Thinkquest- activities related to all five senses-

<http://library.thinkquest.org/3750/smell/smell.html>

Experiments to Try with the Senses-

http://kidshealth.org/kid/closet/experiments/experiment_main.html

Challenge- series of questions related to the senses

<http://www.bbc.co.uk/science/humanbody/body/interactives/senseschallenge/> -Sense

Click on "How We Hear" and students will have an opportunity to observe a sound wave and listen to the sounds of various animals and objects, such as cymbals-

<http://www.wonderville.ca/asset/hearing-and-sound>

Activities related to the Ear-

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

Activities related to the sense of smell-

<http://www.cln.org/themes/smell.html>