

Using Your Senses

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About **Using Your Senses**

DeltaScienceModules, THIRD EDITION

Students explore *Using Your Senses* through twelve hands-on activities and the Delta Science Reader. Introduce your students to the inner workings of the body’s amazing communications network—the five senses. Students examine the structure of each sensory organ (eyes, ears, skin, nose, and tongue) to find out how it works. They use lenses and prisms to create images and colors, explore depth perception, and measure their fields of vision. They experiment with tuning forks, cones, and membranes to model sound waves and eardrums, and construct a zither for manipulation of pitch and volume. They distinguish textures by feel and test sensitivity to touch and temperature changes. Finally, they identify objects in odor boxes by smell and map the four taste areas of their tongues.

In the Delta Science Reader *Using Your Senses*, students read how our five senses—sight, hearing, touch, smell, and taste—take information from our surroundings and transmit it to the brain. The book also describes some of the ways a veterinarian uses her senses in her work. In addition, students explore the communication systems of Braille and American Sign Language.

Overview Chart for Hands-on Activities

Hands-on Activity	Student Objectives
1 Your Eyes Are for Seeing <i>page 13</i>	<ul style="list-style-type: none"> discover that our eyes need light to see observe the iris and pupil respond to changes in light model how light passes through the lens and forms images on the retina
2 Two Eyes See More Than One <i>page 23</i>	<ul style="list-style-type: none"> discover that each eye sees objects from a slightly different viewpoint to give us depth perception observe that depth perception decreases with the use of just one eye measure their field of vision observe that their field of vision decreases with the use of just one eye
3 Seeing in Color <i>page 31</i>	<ul style="list-style-type: none"> compare the colors of objects viewed in darkness and in light use a prism to separate white light into the colors of the spectrum conclude that the color of an object is contained not in the object itself but in the light that strikes it and is reflected into our eyes
4 Is Seeing Believing? <i>page 37</i>	<ul style="list-style-type: none"> make predictions about optical illusions of size and shape, and then measure for accuracy observe the effect of background color on colored squares examine a printed color picture with a magnifier make a flip book and use it to create the illusion of motion
5 Your Ears Are for Hearing <i>page 45</i>	<ul style="list-style-type: none"> discover that sound waves are produced when an object vibrates use an ear horn to learn how the outer ear “catches” sound waves and directs them inside the ear model how sound waves in the ear cause the eardrum to vibrate
6 High and Low, Loud and Soft <i>page 53</i>	<ul style="list-style-type: none"> distinguish between high and low, loud and soft sounds build a zither and use it to explore the variables that affect pitch use what they learn about pitch to tune their zither discover that changing the volume of a sound does not affect the pitch
7 Can You Believe Your Ears? <i>page 61</i>	<ul style="list-style-type: none"> use everyday objects to create illusions involving sound make up a short story present their story to the class, complete with sound effects
8 Your Skin Is for Feeling <i>page 67</i>	<ul style="list-style-type: none"> try to identify objects using just their sense of touch determine which areas of the body are more sensitive to touch than others
9 Feeling Hot and Cold <i>page 75</i>	<ul style="list-style-type: none"> test the relative temperatures of three water samples with their skin detect differences in temperature with their skin discover that the temperature of their skin affects how hot or cold a substance feels to the touch
10 Your Nose Is for Smelling <i>page 81</i>	<ul style="list-style-type: none"> learn how smells are carried by the air to our nose identify a variety of substances based on their smell discover that, like their other senses, their sense of smell can be fooled
11 Your Tongue Is for Tasting <i>page 89</i>	<ul style="list-style-type: none"> identify the four primary tastes: sweet, salty, sour, and bitter map the locations of taste receptors on the tongue
12 Taste and Smell Work Together <i>page 97</i>	<ul style="list-style-type: none"> taste a variety of foods while holding their nose taste those same foods without holding their nose discover that their sense of taste is diminished without their ability to smell
Assessment <i>page 105</i>	<ul style="list-style-type: none"> See page 105.

Using Your Senses

Process Skills	Vocabulary	Delta Science Reader
infer, observe, make and use models	cornea, eyeball, iris, lens, optic nerve, pupil, reflect, retina	pages 4–5
infer, observe, measure	depth perception, field of vision, peripheral vision	pages 4–5
compare, make and use models, infer	prism, spectrum	pages 4–5
predict, observe, make and use models, identify and control variables	optical illusion	pages 4–5
infer, make and use models	ear canal, eardrum, ear flap, sound wave, vibrate	pages 6–7
compare, make and use models, collect, record, display, or interpret data	pitch, volume	pages 6–7
make and use models, communicate	sound effect	pages 6–7
define based on observations, infer	receptor	pages 8–9
make and use models, compare, infer	temperature	pages 8–9
make and use models, identify and control variables, infer	nasal cavity, nostrils, olfactory nerve	pages 10–11
make and use models	taste buds	page 12
make and use models, observe, infer		page 12

See the following page for the Delta Science Reader Overview Chart.

Overview Chart for Delta Science Reader

Using Your Senses

Selections	Vocabulary	Related Activity
Think About...		
Our Amazing Senses <i>pages 2–3</i>	brain, hearing, senses, sight, smell, taste, touch	activities 1, 5, 8, 10, 11
Sight <i>pages 4–5</i>	iris, lens, optic nerve, pupil, retina	activities 1, 2, 3, 4
Hearing <i>pages 6–7</i>	auditory nerve, ear canal, eardrum, inner ear, pitch, sound, vibrate, volume	activities 5, 6, 7
Touch <i>pages 8–9</i>	nerves, texture	activities 8, 9
Smell <i>pages 10–11</i>	nasal cavity, nostrils, olfactory nerve	activities 10, 12
Taste <i>page 12</i>	taste buds	activities 11, 12
People in Science		
A Veterinarian <i>page 13</i>		
Did You Know?		
About Braille <i>page 14</i>		activities 1, 2, 3, 4, 8
About American Sign Language <i>page 15</i>		activities 5, 6, 7

See pages 113–120 for teaching suggestions for the Delta Science Reader.

MATERIALS LIST

Using Your Senses

Quantity	Description		Description
4	alcohol swabs*	1	tape, masking*
1	bag, bubble, 7 in. × 8.5 in.	4	tea bags*
16	bags, paper #8	1	toothpaste, travel size*
2	bags, self-sealing, 6 in. × 6 in.	1	toothpicks*
1	ball, table tennis	1	Transparency, Ear
8	balloons*	1	Transparency, Eye
2	batteries, D-cell*	8	tuning forks
52	boxes, sound and odor	1	vinegar, white, 2 oz*
1	cards, index	1	Wordsearch BLM
16	cloth, felt, white 2 in. × 4 in.		
20	coffee packets, instant*	1	Teacher's Guide
16	collars, field of vision tester	8	Delta Science Readers
8	containers, plastic, 9-oz		
1	cotton balls, p/50*		
1	cotton swabs, p/180*		
1	Crossword Puzzle BLM		
64	cups, 1-oz plastic		
120	cups, paper*		
3	extracts (banana, mint, vanilla)*		
6	filters, acetate, red 10 in. × 12 in.		
1	flashlight, D-cell		
1	Fun Facts BLM		
16	gloves, latex		
1	glue, white*		
16	hairpins		
16	ketchup packets*		
16	lemon juice packets		
16	magnifiers		
1	marker, black		
16	mayonnaise packets*		
20	mustard packets*		
1	paper, construction, 3 shades of gray*		
–	paper, construction (1 each: black, blue, green, orange, red, violet)*		
3	paper, construction, yellow*		
1	peas, beans, dried bag		
1	pen, permanent black marker*		
8	prisms		
4	relish packets*		
1	rice, uncooked, 1 lb		
1	rubber bands, large, p/32		
1	rubber bands, small, p/32		
16	salt packets*		
2	sandpaper squares		
1	seeds, bean, white navy, 1 lb		
1	shampoo, trial size*		
1	soap, hotel size*		
112	straws, plastic, 5.75 in. long, clear*		
1	string, roll*		
16	sugar packets*		

1 **Teacher's Guide**
8 **Delta Science Readers**

TEACHER-PROVIDED ITEMS

- 1 aluminum foil, 12 in. × 12 in.
- 1 apple
- 1 bag, grocery, plastic
- 2 bags, plastic, reclosable (optional)
- 32 blindfolds (optional)
- 2 bottles, glass
- 1 bottle, soda (glass or plastic)
- 1 box, cardboard, large
- bubble gum (optional)
- bubble wrap (optional)
- 32 cartoons from newspaper
- 1 cellophane roll
- 1 cookie sheet
- 33 cookies, assorted
- 32 crayons, p/8
- 1 knife, serrated
- 32 newspaper color comics frame
- 1 onion
- 1 orange
- 1 overhead projector
- 1 paper clip
- paper towels*
- paper, waxed
- 3 paper, white (8.5 in. × 11 in.)
- 40 pencils
- 48 pennies
- 24 plastic containers or mixing bowls
- 16 plates, paper (optional)
- 1 potato
- 32 rulers, metric
- 7 saucepans
- 32 scissors
- 32 shoeboxes with lids
- 8 spoons, large metal
- 1 stapler
- 1 tape, transparent
- water (cold, hot, and warm)

* = consumable item † = in separate box

ACTIVITY SUMMARY

This Delta Science Module presents activities about the five senses: sight, hearing, touch, smell, and taste.

ACTIVITY 1 The eye is introduced as the sense organ responsible for sight. Students discover the importance of light to vision, observe how the eye responds to changes in light, and model how an object reflects light and projects an image onto the back of the eye for interpretation by the brain.

ACTIVITY 2 Students learn the advantages of having two eyes. First, seeing with two eyes gives us depth perception—the ability to judge distances. Second, our field of vision is much larger with two eyes than it is with one. Students conclude that one eye is not merely a replacement for the other. Both eyes work together to help us see more and better.

ACTIVITY 3 Students learn how we see in color. Students discover that light is made up of many colors and that the apparent color of an object depends on the colors of light that are absorbed and reflected by the object.

ACTIVITY 4 Students view optical illusions of size, shape, color, and movement to learn that sometimes we cannot believe everything we see.

ACTIVITY 5 Students learn how sound is produced, how our ear flaps “catch” sound waves and direct them inside the ear, and how sound waves in the ear cause the eardrum to vibrate.

ACTIVITY 6 Students discuss sounds in terms of pitch and volume. Then they build a stringed instrument and use it to explore the variables that affect pitch and volume. By producing sounds that are high and low, loud and soft, students discover that pitch and volume are independent of each other.

ACTIVITY 7 Students have learned (in Activity 4) that our eyes can trick our brain into perceiving something that is not real. By making their own sound effects and producing them for friends, students learn that we cannot believe everything we hear, either.

ACTIVITY 8 Students learn that the skin is the largest sense organ in the body and that it contains receptors to detect touch, pressure, pain, heat, and cold. Students also discover that certain areas of the body are more sensitive to touch than others.

ACTIVITY 9 Students learn more about how heat and cold receptors in the skin respond to differences in temperature.

ACTIVITY 10 Students examine the nose and how we smell. Students use their sense of smell to identify a variety of substances. From this they learn that their sense of smell is pretty good—but not perfect.

ACTIVITY 11 Students examine the tongue and how we taste. In this activity, students sample and name the four basic tastes: sweet, salty, sour, and bitter. Then students make a map that shows which parts of the tongue are especially sensitive to each taste.

ACTIVITY 12 Students are shown how our senses of taste and smell work together. Students taste foods, first with their nose plugged, and then unplugged. They discover that our ability to taste is compromised when we are unable to smell.