

K-1: The Senses

OUR SENSE OF TOUCH

Written by

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Activities from the *K-1: The Senses Teacher's Guide* may be used alone or with integrated unit components. The Learning Brain: Senses unit is comprised of the guide, a PowerPoint® slide set, "What Sound Is It?" for use with the activity, "Our Sense of Hearing," and a student storybook, *Making Sense!* (available as a PowerPoint® file and in PDF format). All files are available free-of-charge at BioEd Online (www.bioedonline.org).

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OUR SENSE OF TOUCH

Guiding Questions

How does the sense of touch work? Is the sense of touch more sensitive in some parts of the body, such as fingertips, than in others?

Concepts

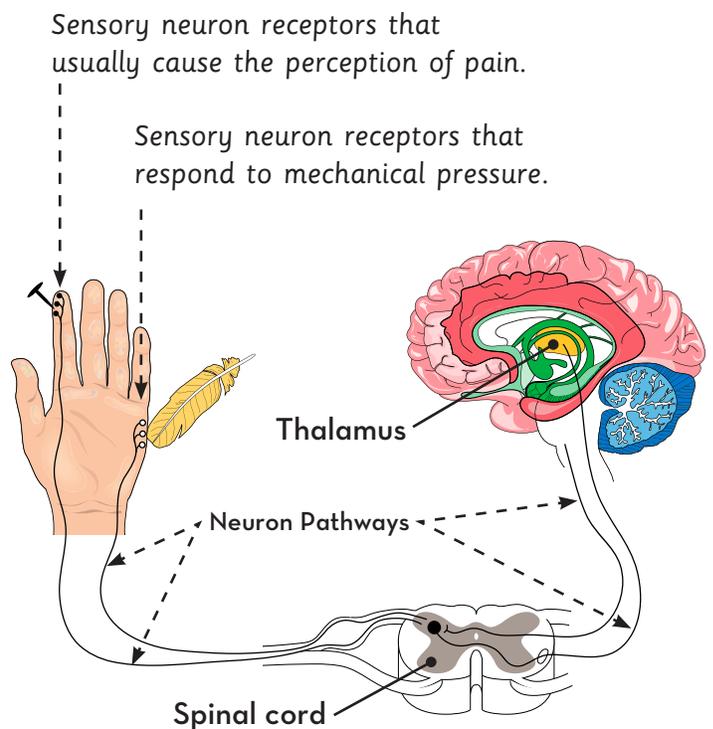
- All of the senses are connected to the brain.
- Our senses let us know what is going on inside and outside our bodies.
- One of our senses is touch.
- The sense of touch varies on different parts of the body.
- Touch receptors on the skin send information to the brain.
- The brain is able to discriminate among many tactile objects.
- The sense of touch actually includes several distinct senses, such as pressure, temperature and pain.

Time

Setup: 10 minutes

Class: 30 minutes

Touch commonly is referred to as a single sense. However, the ability to distinguish between the brush of a feather and the pain of a pinprick involves many different kinds of receptors in skin.



The tactile sense, traditionally called “touch,” encompasses a large group of more or less separate somatic senses (“somatic” refers to features of the body). The sensations of touch, pressure, vibration, temperature and pain all are detected in the skin and deeper tissues. The sense of proprioception uses signals from joints and muscles to provide information about the position of the body and limbs.



Receptors, or “sensors,” respond to different kinds of stimuli. For example, pressure receptors at the base of each hair detect minute movements that correspond to contact, or being touched. Other specialized receptors register temperature. Pain is detected by free nerve endings.

Receptors for different sensations are not distributed equally. In any given area, there usually are more pain receptors than pressure or temperature receptors. In addition, some areas of the body have more sensory receptors of a particular kind than other areas have. For example, there are more pressure-sensitive receptors on the tip of the tongue and on the fingertips than anywhere else in the body.



In this activity, students will compare the relative sensitivity of skin on two different parts of their bodies (upper arm and fingertips). By trying to feel the difference between two similar objects with slightly different textures, students discover that the skin is more sensitive in areas that have greater numbers of touch receptors, and less sensitive in areas with fewer receptors.

MATERIALS

Teacher Materials

- Classroom human body diagram (see the activity, “The Brain: Protection”)
- 12 brown paper lunch bags

- 12 sets of two similar materials that can be discriminated by touch (at least 1-in. square in size). Suggested items are as follow.

- Aluminum foil and wax paper
- Coin and button (similar sizes)
- Coin and washer
- Construction paper and glossy paper from a magazine
- Cotton and wool cloth
- Cotton ball and synthetic fur
- Different grits of sandpaper
- Fine and coarse sandpaper
- Smooth and rough cardboard
- Smooth and rough fabric
- Smooth and rough pebbles
- Copy paper and paper towel
- String and yarn
- Wire and rubber band

- Teddy bear

Per Student

- Cotton ball

SETUP

Prior to class, make two sets of 6 pairs of similar objects in numbered (1-6) brown paper lunch bags. See materials list for suggested items. You will need one bag per student team.

Conduct this activity with students working in teams of two.

PROCEDURE

1. Give each student a cotton ball to examine closely. Ask, *What does it feel like? Does it feel like a teddy bear? How do you know?* Let students touch a teddy bear or other stuffed animal to compare the textures.
2. Ask, *What are your fingers telling you?* Have students describe the texture of the cotton ball. If they are unfamiliar with the term, “texture,” explain that it usually refers to how something feels when touched. Ask the class to think of words that



describe textures (such as smooth, rough, firm, soft, bumpy, prickly, gritty, etc.). You may want to place the words on a chart or word wall.

3. Remind students that they have learned about vision, hearing, taste and smell. Each sense involves receptors that gather information from the environment, which then is transmitted to the brain.
4. Ask, *Where are your touch receptors?* Most students will say, “the fingers.” Ask, *Can you feel with your elbow?* Have students rub the cotton ball over their elbows. Ask, *Does it feel the same on your elbow as on your fingers?* Make sure students draw the conclusion that all skin has touch receptors.
5. Have students sit in pairs. Give one of the bags you have prepared to each pair.
6. Instruct one student (the “subject”) in each pair to close his or her eyes. Have the other student (the “tester”) remove the two items from the bag and gently rub one item at a time on the subject’s forearm or upper arm. Have each tester ask the subject, *Can you tell any difference in the two items? Do you know what they are?*
7. Have the same student (tester) gently rub the same two items on the subject’s fingertips and ask if the subject can tell a difference between the items, and/or identify either item.
8. Rotate the sample bags among pairs of students, making sure that teams have a different numbered bag for each investigation. Have the students in each pair trade jobs and repeat steps 6 and 7, as time allows.
9. Ask the class, *Were you able to feel the difference between each pair of items with both your arm or finger? What was the difference in how the items felt on your arm and fingers? Why do you think this is the case?* Explain that the entire body has nerve endings

that “feel,” but that some areas have more sensory receptors than other areas do. Areas with more sensory receptors are more sensitive.

10. Follow by asking, *What else can our skin tell us, besides shape, size and texture? Have you ever been too hot, too cold or in pain?* Explain that certain sensory receptors in the skin communicate other conditions directly to the brain to keep us safe.
11. Conclude the lesson by having a several students use pieces of yarn to connect different places on the skin to the brain on the classroom human body diagram.

EXTENSIONS

- Fill three small containers: one with warm water, one with cold water and one with room temperature water. Have students explore their abilities to detect temperature by placing one finger in the warm water, and one finger in the cold water for a few seconds. The skin does not perceive exact temperatures, but will sense temperature differences. Next, have students place both fingers in the room temperature water. Ask, *Is the water warm or cold?* Explain that the brain just received confusing messages from the senses in their fingers. To a warm finger, the water will seem cold, while to a cold finger, the same water will feel warm.
- Place several common objects of different sizes and shapes inside a container of warm water. Have students identify the objects using only their sense of touch. Ask, *Could you also detect the water temperature at the same time?* Students will learn that they can sense temperature and size/texture simultaneously.

RECOMMENDED RESOURCE

- Rissman, Rebecca. *Touching (The Five Senses)*. (2010) Heinemann Educational Books. ISBN: 978-1432936884



My Science Journal

Name _____

Drawing

Key Words to Use

I Observed...
