

ROUGH TOUCH

STEPS FOR *ROUGH TOUCH*

- 1. Warm-Up Activity:** As a class, review the five senses. Write each one down on the board. Have students identify the associated organ for each of the five senses (sight/eyes, hearing/ears, and so on). Focus student attention on touch. Explain that skin is also an organ and it is used in the sense of touch. The skin is the largest organ of the human body. Ask students how they know that a bunny feels soft, ice is cold, or a pencil point is sharp. They will probably say their skin feels these different things. Tell students that skin is attached to bundles of long, slender threads called **nerves**. The nerves carry information from the skin to the brain.
- 2.** Divide students into pairs. Hand out the set of sandpaper samples and a blindfold to each pair of students. Caution students that they are not to touch the sandpaper until you give directions.

In addition to the sandpaper samples, pass out the *Rough Touch* Student Handout.
- 3.** Have students observe the sandpaper. What is different about each of the samples? Explain that “rough” sandpaper has very large particles on it, while “fine” sandpaper is smoother, with very tiny particles.
- 4.** Explain to students that they will try to sort the sandpaper from finest to roughest using only their fingers. To prevent students from looking at the sandpaper, one student from each student pair will be blindfolded as he or she touches the materials.
- 5.** Have one student from each pair put a sleep mask over his or her eyes. Blindfolds will work as well, but you may need to help students tie them. Then, have the sighted partners mix up the sandpaper samples randomly and hand the blindfolded individual the various sandpaper samples. Caution students that to avoid injuries, they should not to rub the sandpaper on themselves or another student.

Once the blindfolded partner has decided on the order, the sighted partner should record the order in the data table on page 1 of the Student Handout. Then have the sighted partner mix up the samples and have the blindfolded partner attempt to organize the samples a second time. The sighted partner should record the data for this second trial.

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6. Once the blindfolded partner has performed two or three trials, have the partners switch roles and repeat the investigation, with one partner wearing a blindfold and the other recording the results.
7. Have students repeat steps 5 and 6 using different parts of their body, such as an elbow, the back of their hand, their wrist, or their calf. Be sure students rub their skin very gently with the sandpaper so that they do not cut their skin.
8. **Wrap-up Activity:** Once all students have had an opportunity to sequence the sandpaper samples on different parts of their bodies, call the class to attention and review the results of the exploration. Share with students the correct order of the sandpaper samples, from coarsest to finest. Were students able to organize the sandpaper by texture using their fingers? Were the results different for different parts of the body? Have students think about why this might be the case. Explain to students that different parts of the body have different amounts of nerves. The fingers have many nerves located close together under the skin, while other areas, such as the calves, do not have as many nerves. How could this explain the results in the investigation?

Have students answer the questions on page 2 of the Student Handout.

Rough Touch Extension Activities

1. As a class, name and describe the five senses (touch, smell, sight, hearing, taste). Identify the various organs used to sense our environment. Have students explain the importance of each sense and how each sense contributes to their ability to experience and describe their environment.
2. Have students explain the range and limitations of each sense and, if they are able, give examples of the types of instruments scientists have built to extend our senses. If you have examples of such instruments or equipment, hold them up and discuss each. Examples of tools and equipment used to expand the ability of human senses include binoculars, microscope, hearing aid, and smoke or carbon monoxide detector

What is touch?

The sense of touch is conveyed by special cells in the skin that respond to different cues from the environment, such as temperature, pressure, vibration, or chemical reactions. Although our other senses are localized to a specific region on our bodies (for example, the sense of sight is localized at our eyes), touch occurs throughout the body, wherever skin comes in contact with the environment. When our skin interacts with a stimulus, the receptors send signals to our brain via **nerves** in the central nervous system. As a result, we experience the sensations of hot, cold, pain, and pressure.

How sensitive is our skin?

Sensory receptors are distributed unevenly throughout the skin. For example, fingers and lips provide very detailed senses of touch whereas the back of a leg provides only general sensitivity. The most sensitive parts of our body contain more nerve endings to help protect them from damage. Our face, feet, and hands contain the most nerve endings.

Key Vocabulary

touch: One of the five senses; the transmission of information from the environment through sensory receptors in the skin, nerves, and brain

nerve: A bundle of threads (fibers) that transmits signals throughout the central nervous system

skin: The largest organ in our body; skin contains sensory receptors that respond to stimuli

Part of Body	Trial number	Order of Sandpaper Samples
[Fingers]	Trial 1	[A, C, B, E, D]
	Trial 2	[A, C, B, D, E]
[Elbow]	Trial 1	[C, A, B, D, E]
	Trial 2	[C, B, A, E, D]
[Calf]	Trial 1	[B, A, C, D, E]
	Trial 2	[C, B, E, A, D]

ANSWER THE FOLLOWING QUESTIONS:

1. Describe how you use your sense of touch to explore and understand your world.

[Answers will vary.]

2. Which samples were most difficult to put in order?

[Answers will vary.]

3. Which part of your body was best at organizing the sandpaper samples? Which was the worst?

[Answers will vary.]

4. If you want to poke your friend to get his or her attention, which of the following body parts would you poke: hand, calf, or elbow? Explain your reasoning.

[Sample answer: I would poke my friend's hand because the hand is more sensitive to touch than the calf and elbow.]

ROUGH TOUCH STUDENT HANDOUT

Name:

Date:

Part of Body	Trial number	Order of Sandpaper Samples
	Trial 1	
	Trial 2	
	Trial 1	
	Trial 2	
	Trial 1	
	Trial 2	

ANSWER THE FOLLOWING QUESTIONS:

1. Describe how you use your sense of touch to explore and understand your world.
2. Which samples were most difficult to put in order?
3. Which part of your body was best at organizing the sandpaper samples? Which was the worst?
4. If you want to poke your friend to get his or her attention, which of the following body parts would you poke: hand, calf, or elbow? Explain your reasoning.