



Two point discrimination

Lesson Plan

Objectives:

Elementary school

1. Understand that different parts of the brain gather sensory information for each body part.
2. Understand that each body part has a different level of sensitivity.
3. Understand that differences in sensitivity are due to the number of cells that respond to touch, pressure, etc.

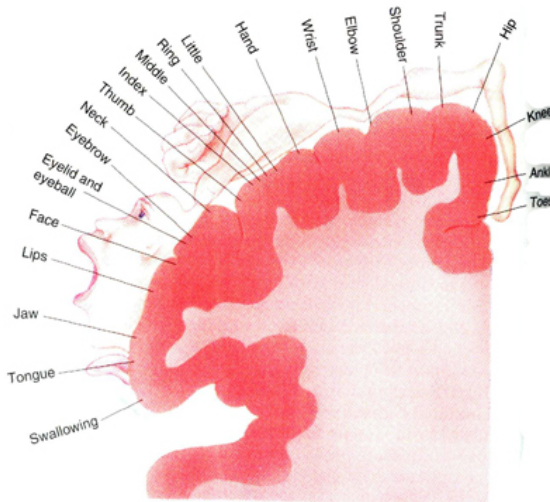
Middle/High school

1. Understand what parts of the brain are responsible for sensory information (explain homunculus).
2. Understand the term "receptive field" and how neurons in different parts of the body have different size receptive fields.
3. Understand that neuron packing/density determine receptive field size.

Background information:

Depending on the age and background of the participants you may need to explain the following concepts:

- The nervous system is made up of specialized cells called neurons. Different kinds of neurons serve different functions. Somatosensory neurons are specialized cells that are in charge of passing information about the sense of touch from the body to the brain.
- These somatosensory neurons collect together under the skin to form large fiber bundles called nerves. The nerves span the entire body allowing us to sense touch all over. When activated they send information to the brain.
- The primary somatosensory cortex receives information from the body and is located within the parietal lobe.
- The homunculus ("little man" in Latin) refers to the representation of different body parts on to different areas of the somatosensory (and motor) cortex. This depicts how much of the somatosensory cortex is devoted to sensation for each part of the body.



Facilitating the activity:

Hypothesize with the students about the ability to discriminate between two points on different areas of the body. Demonstrate the following activity with a volunteer first and then ask pairs of participants to perform the activity on each other on three different body parts (i.e., finger, arm, back)

- Ask your partner to close their eyes

Юрий Педаченко

STUDENT PRIOR KNOWLEDGE

Students should be familiar with the following concepts prior to this activity:

- Each part of the body has a different level of sensitivity

PARTICIPATION

This station is designed for 5 – 6 pairs of students.

MATERIALS

- One compass per pair of participants
- One blank table per participant (see below)

TIME

- Prep: < 5 minutes
- Activity: 10 – 12 minutes

SAFETY NOTES

- Make sure students are not using the compass in a harmful or dangerous manner

TEACHING TIPS

- Ask questions about students' own experiences: "have you ever felt a bug on your arm? Or had someone point one out to you?"



Two point discrimination

Lesson Plan

- With the compass approximately 3" apart, touch the two points gently to your partner's forearm (or other designated body part) and ask "Do you feel one point or two?"
- Move the two points closer together and repeat until your partner feels only one point
- Record the distance at which the two points feel like one
- Repeat for the other designated body parts and record your findings

Review the group's results once everyone is done collecting data. Use the homunculus to help explain why it is advantageous for different parts of the body to have different sensitivities to touch. Be sure to cover the concepts of receptive fields and packing density with more advanced learners.

Make copies of this page, cut out each table and provide one to each participant to record the data they collect during the activity

Area of body being tested	Distance of one point sensation (inches)

Area of body being tested	Distance of one point sensation (inches)

Area of body being tested	Distance of one point sensation (inches)