

Nerve Tester

Overview: Our sense of touch provides us with information that helps us to process and explore our world. Nerves play an important part in the sense of touch by being the wires that carry signals from the skin to the brain. But the body has a plan in place so that our brains don't get overwhelmed with too much information. This plan is a lot like a blueprint for wiring a house. Just like a house has light switches and electrical outlets in strategic locations, our bodies have touch receptors of various numbers based on their location. In this lab, we will explore an arm to determine where the highest concentrations of nerves are in that limb.

Materials

- paper clip, large
- ruler
- partner

Experiment

1. Unfold a paperclip so that it has two open ends, forming a "U" shape. The ends should be about a centimeter apart. Measure it with your ruler to check.
2. Have your partner uncover their arm up to the shoulder. They should place this arm on the table, palm up, but it is also important that they face away from you. They shouldn't be able to see the test.
3. GENTLY touch one or both of the open paperclip ends to your partner's fingertip. Ask your partner to determine how many points you used to touch them (one or two). Then record their response as (Y) for a correct answer or (N) for incorrect.
4. Continue testing based on the numbered points in the diagram. Randomly vary the points used to touch your subject's skin, recording their Y (correct) or N (incorrect) response for each individual area.
5. Repeat steps 3 and 4, with the paperclip ends separated at a distance of 3 cm, 5 cm, and 10 cm.
6. Your turn! Switch places and have your partner test you and record your responses.
7. Finally, use the diagram and your data to design a map of nerve concentrations in the arm and hand. What are some of the advantages of this nerve placement?

Nerve Tester Data Table

Location	1 cm – correct?	3 cm – correct?	5 cm – correct?	10 cm – correct?

Reading

Endings are nerves are located so that we can use them to collect data. The highest concentrations of nerves are in our hands, feet and mouths. We use our hands to gather a lot of data, our feet for moving around, and our mouths for speaking. Luckily, the areas of our bodies that are more likely to be bumped and the ones we use to help protect ourselves have fewer nerve endings. Areas of particularly low concentration include our backs, rear ends, and arms.

Our tongues have the highest nerve concentration of all. In fact, nerve mapping researchers have learned that over half of our brain’s sensory nerves are connected to our tongues. It makes sense when you realize that we taste, talk, and feel with this relatively small organ. It really needs to connect to so many places in the brain!

Exercises

1. Where is the highest concentration of nerve endings in the body?
2. What are nerve ends used for?
3. Where do you think the least amount of nerve ends should be in the body?

Answers to Exercises: Nerve Tester

1. Where is the highest concentration of nerve endings in the body? (The tongue.)
2. What are nerve ends used for? (To collect data to keep us safe and survive!)
3. Where do you think the least amount of nerve ends should be in the body? (Backs, rear ends, and arms... parts that are least likely to bump into something.)