

Name \_\_\_\_\_ Date \_\_\_\_\_

## Reaction Time Lab

### Background Information:

Your body reacts to your environment because of your nervous system. Any internal or external change that causes a response is called a stimulus.

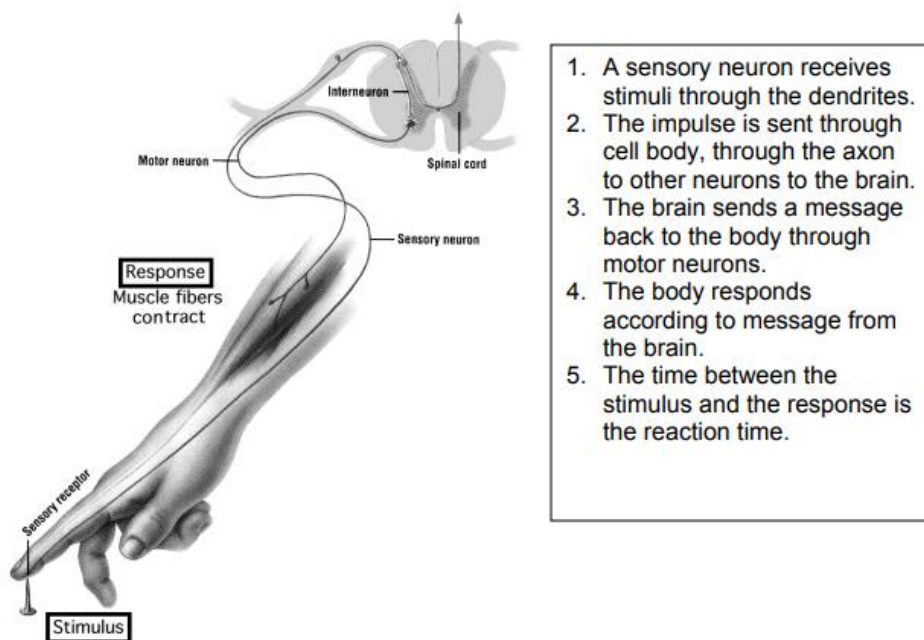
Coordinated movements of the human body do not happen by themselves. Movements are controlled by the central nervous system - the brain, spinal column, and nerves. The central nervous system gets information from the outside through special systems called senses. (sight, sound, touch, taste, and smell).

Your body has sensory receptors that produce electrical impulses and respond to stimuli, such as changes in temperature, sound, pressure, and taste.

The basic units of the nervous system are nerve cells, or neurons. A neuron is made up of a cell body and branches called dendrites and axons. Dendrites receive messages from other neurons and send them to the cell body. Axons carry messages away from the cell body.

Any message carried by a neuron is called an impulse. There are three types of neurons – sensory neurons, motor neurons, and interneurons—that transport impulses.

- Sensory neurons receive information and send impulses to the brain or spinal cord.
- Interneurons relay these impulses to motor neurons.
- Motor neurons then move impulses from the brain or spinal cord to muscles or glands throughout your body.



Reaction time is a measure of how quickly you can respond to a given stimulus. It is more complex than a reflex. It requires information to be sent to the brain to be interpreted and back to cause an action.

**Question: Which sense will allow you to react to a stimulus the fastest?**

**Materials:** Reaction Time Card with fractions of seconds printed on it. The numbers on the edge of the card are fractions of a second as the card falls from bottom to top.

**Procedure:**

**SIGHT:**

1. Have your partner hold the card at the top.
2. Place your thumb and forefinger just below either side of the bottom of the card. Use the same hand every trial.
3. Watch the card. When your partner drops it, catch it as fast as you can.
4. Record the reaction time. Repeat steps 1 through 3 for a total of 5 trials.
5. Switch roles with your partner and repeat the steps above.

**SOUND:**

1. Follow the same procedure as above, but close your eyes. Your partner will say "go" when he/she drops the card. Catch the card as fast as you can.

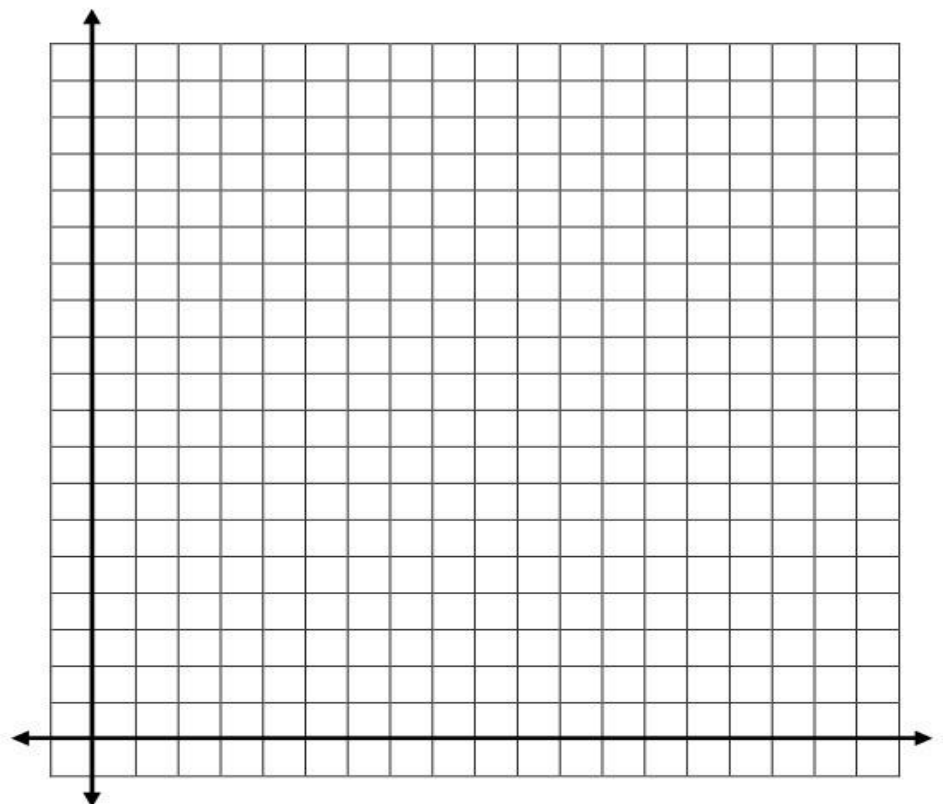
**TOUCH:**

1. Follow the same procedure as above, but close your eyes. Your partner will tap your shoulder as he/she drops the card. Catch the card as fast as you can.

**Data Table:**

Reaction Time (seconds)			
Trial	Sight	Sound	Touch
1			
2			
3			
4			
5			
Average			

**Data Analysis:** Construct a bar graph of the averages above. Remember to add a title, scale and labels to the graph.



**Analysis:** Describe the path of a stimulus from sensory receptor to motor neuron. \_\_\_\_\_

\_\_\_\_\_

Did the reaction time change for each type of stimulus from the first trial to the last?

Explain. \_\_\_\_\_

\_\_\_\_\_

How can the differing paths for each stimulus account for the difference in reaction time? \_\_\_\_\_

\_\_\_\_\_

Explain why the average reaction time was graphed to compare your reaction time to different stimuli and not just your fastest time for each? \_\_\_\_\_

\_\_\_\_\_

**Conclusions:** Write a paragraph to explain the results of your lab.

Claim: Answer the question on the previous page.

Evidence: Explain your data.

Reasoning: Use the background information to explain why the results happened and why your data supports your claim.

**Claim:** \_\_\_\_\_

\_\_\_\_\_

**Evidence:** \_\_\_\_\_

\_\_\_\_\_

**Reasoning:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**System Interactions:**

List 6 systems that worked together to complete this lab. Then, explain how the systems worked together.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

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