

## Lab #12 Human Response Time

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### **PRE-LAB:**

**Aim:** How can we determine our reaction time to a specific stimulus?

**Directions:** In this activity, you will learn how the nervous system helps you respond to stimuli in the environment. In order to complete this lab successfully, consider the following questions and exercises.

1. Define each of the following terms:

a. Stimulus: \_\_\_\_\_

b. Response:  
\_\_\_\_\_

c. Receptor:  
\_\_\_\_\_

d. Effector:  
\_\_\_\_\_

2. Describe how a neuron is specially adapted to its function.

\_\_\_\_\_  
\_\_\_\_\_

3. Compare and contrast a sensory neuron and a motor neuron.

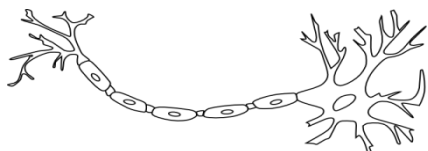
\_\_\_\_\_  
\_\_\_\_\_

4. Trace the pathway that impulses follow in a reflex arc from receptor to effector.

\_\_\_\_\_  
\_\_\_\_\_

5. How does the nervous system help maintain homeostasis? Give an example.

\_\_\_\_\_  
\_\_\_\_\_

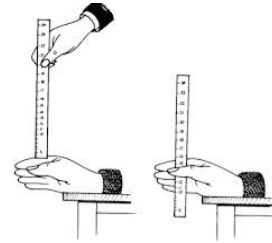


**Introduction:** Our nervous system helps us to respond to different stimuli in our environment. Each day we are confronted with things happening all around us, and our bodies must adjust to them. In this experiment, you will see how we react to stimuli and judge how quickly we can respond.

**Student Objectives:**

*You will be able to:*

- Collect, tabulate and manipulate data from an experiment.
- Calculate a reaction time.
- Design an experiment to test the effects of practice and fatigue on reaction time.
- Formulate conclusions based on data.
- Construct and interpret a graph.



**Materials:**

Meter stick, calculator, clock or watch

**Procedure:**

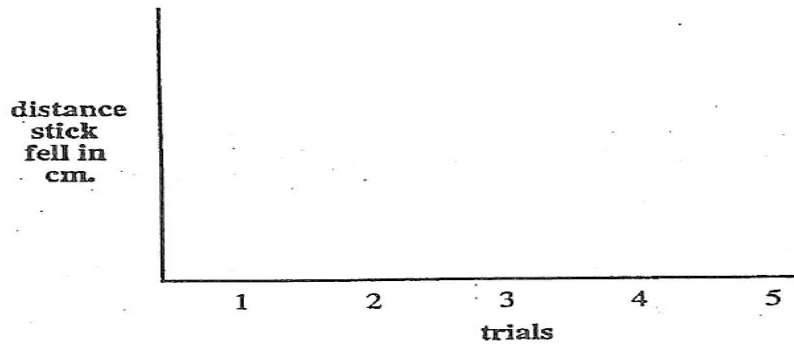
1. You and your partner will take turns being the subject and the experimenter.
2. Have your partner rest his/her arm on the lab table so that the forearm extends out over the edge.
3. Hold the zero end of the meter stick vertically just above your partner's open thumb and index finger.
4. Without warning, drop the stick and have your partner catch it between the thumb and index finger.
5. Note and record the position of the fingers on the stick. The number at which the stick is caught represents how far the stick fell in centimeters before it was caught. Write this number in the data table under "Trial 1."
6. Repeat this procedure 4 more times.
  - a. If the stick falls to the floor without being caught, disregard that trial and repeat it.

**Observations/Data:**

Fill in the following data table

Name	Trial 1 (cm)	Trial 2 (cm)	Trial 3 (cm)	Trial 4 (cm)	Trial 5 (cm)

7. In the space below, prepare a graph showing the distances your meter stick fell for each trial. Put the trials on the x-axis (horizontal) and the distance in cm on the y-axis (vertical)



8. Calculate the AVERAGE distance the meter stick fell in all the five trials for YOUR data. Show all work!

**Conclusion:**

1. Describe the pathway that the impulses traveled in your nervous system to allow you to respond to and catch the falling meter stick.

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2. Average reaction times are less than one second. What does this imply about the speed of impulse transmission in the human nervous system?

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3. How is the neuron adapted to speed up the transmission of nerve impulses?

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