

Name:

Inquiry into Human Reaction Time

Problem:

Design an experiment to measure reaction time in humans, and demonstrate the effect of a particular variable of your choice on reaction time.

Background:

Reaction Time is defined as the time it takes for an organism to respond to a particular stimulus. In this lab, you will create a protocol to measure the time it takes for your lab partner to respond to a stimulus of your choosing. Because human response time to particular stimuli is often on the order of a fraction of a second, using a protocol that relies on a timer is not necessarily the best approach to take.

Coincidentally, the work of Galileo Galilei demonstrated that objects near Earth's surface accelerate as they fall due to gravity at a rate of 9.8 m/s^2 . Among other work, Isaac Newton later demonstrated that the distance (s) an object travels as it accelerates (a) from rest is dependent on the time (t) it travels, and can be calculated according to the following equation:

$$s = \frac{1}{2}(at^2)$$

Materials:

Materials are dependent on the design of your experiment. Typically, we have access to all common materials you might require for the conduct of this lab. Should you feel that other materials are necessary, or that there may be a question as to the availability of a required material, please consult with your instructor

Steps to complete before beginning your experiment:

- Develop a detailed protocol & clear experimental plan for your experiment.
- Develop a data table for your experiment.
- Determine any calculations that will be necessary for your data.
- Think about how you will graph your results (if necessary).

After reviewing your protocol and discussing any safety hazards, your instructor must approve your protocol before you can conduct your experiment.

Data Collaboration:

Following the completion of the lab, you will collaborate with other groups to share your data. Your lab report must include your individual data & class data.

Analysis Questions (to be answered in your report following your conclusion):

1. For this experiment, what was the independent variable and what was the dependent variable? What were the constants?
2. Did you run several trials for each hand? Why or why not?

3. Explain why a message moving along nerve pathways takes time.
4. How might the results change if you did this experiment with a person of 70 years old? Why might this be so?
5. How might the results change if you did this experiment with a professional athlete? Why might this be so?
6. There are several ways of measuring reaction time in a variety of different situations. The field of study that investigates reaction time phenomena is known as “Mental Chronometry” Research reaction time, and mental chronometry, and answer the following questions:
 - a. What are some of the basic modes of measuring reaction time?
 - b. What mode of measuring reaction time does your experiment employ?
 - c. How does reaction time in your experiment compare to other modes of measuring reaction time?
 - d. Pick a mode of measuring reaction time that is different from the one employed in your study and design an experiment that involves measuring that mode of reaction time. Include a hypothesis, procedure, and predict the results you might see.