

LAB 7: REACTION TIME

QUESTION

Which is faster, your reaction to a sound or your reaction to a visual stimulus?

SAFETY

Standard safety precautions apply.

MATERIALS

Ruler

PROCEDURE

There is a common parlor trick in which a person holds a dollar bill in the space between the slightly spread-out finger and thumb of another person. That person is told that the dollar bill will be dropped without notice and if he can catch the dollar bill, it's his to keep. Most people do not have a reaction time fast enough to catch the bill.

In this lab, you will be recreating this trick but will be using a ruler so it's possible to calculate your reaction time. You should be familiar with the equation $d = 1/2at^2$, where d is the distance that the ruler falls, a is the acceleration of gravity, and t is your reaction time. You will be doing this both with your eyes open and with your eyes closed with an auditory signal.

Get a partner to help you with this experiment; he or she will drop the ruler.

1. Hold your hand out with your thumb and your forefinger separated by about a centimeter. Have your partner put the end of the ruler between your fingers. Instruct him or her to wait a short time and then drop the

ruler without notice. You should catch it as quickly as possible and record how far the ruler fell in a data chart.

- Repeat Step 1 four more times and average the results. Record your average in the data chart.
- Repeat Step 1 five more times, but this time you should have your eyes closed and your partner should say “go” just as he or she drops the ruler. Average the results and record the number in the data chart.

Data Chart

Use the skeleton of a data chart below to create your own chart.

Eyes open:

Trial 1 _____ m Trial 2 _____ m Trial 3 _____ m Trial 4 _____ m Trial 5 _____ m

Average _____ m

Eyes closed:

Trial 1 _____ m Trial 2 _____ m Trial 3 _____ m Trial 4 _____ m Trial 5 _____ m

Average _____ m

Post-Lab Questions

- Measure the length of a dollar bill. What would a person’s reaction time have to be to catch the dollar bill?
- Calculate your reaction times from your averages and the equation on the previous page. Don’t forget that all of your measurements have to be in meters. Which was faster, eyes open or eyes closed?
- If your reaction time was 0.19 s, what is the shortest object that you could catch this way?

Extension

Imagine you’re driving a car and see an obstacle ahead. You have to react to that situation, move your foot to the brake, and stop the car. Calculate how far you would travel during *your average reaction time* if your car were traveling at 25 mi./hr., 50 mi./hr., 75 mi./hr., and 100 mi./hr. Give your answers in feet (there are 5,280 ft. in a mile).