Reaction Time Lab

Introduction

You can find your reaction time by measuring the distance an object falls before you catch it and using a relatively simple calculation involving gravity:

$$t_{reaction} = \sqrt{2(s)/g}$$

(Note: do the calculation inside the square root sign first, then take the square root of that answer to get your reaction time.) s = distance the object falls in METERS and g= gravity or 9.8 m/s/s.

Material

* a ruler
* one dollar or larger bill

To Do and Notice

1) One person holds a ruler by its top, near the end with the largest number.
2) The other person places the centers of his or her fingers next to the 0 mark on the ruler ready to grab it. The second person should rest his or her hand on the edge of a table to prevent them from moving the hand up or down while the ruler falls. The fingers should be several inches apart.
3) The first person drops the ruler and the second person catches it.
4) Read the distance at the center of the fingers in centimeters. To convert this to meters, divide by 100. 23.5 cm = .235 m.
5) Record the data and calculate the reaction time using the formula in the introduction.
6) Repeat two more times for a total of 3 pieces of data and average the reaction time.
7) Repeat for the other person or persons in your group. Record the data in your lab book.

Person	Trial	Distance in cm	Distance in m	Reaction time calculation
	1			
	2			
	3			
	ave			
	1			
	2			
	3			
	ave			

Data Analysis:

The average human reaction time from eyes to fingers is 0.16 s. By what percentage does your time differ from this? Your average value is the observed (O) value. .16 s is the accepted (A) value. Use the formula:

% difference = ((O-A)/A) * 100

What is your percent difference from the average? (Show your work!)

Now, repeat the experiment using your feet (both of them) to catch the ruler. Measure to the point where the feet have captured the ruler. Be sure to record your data in your lab book.

Person	Trial	Distance in cm	Distance in m	Reaction time calculation
	1			
	2			
	3			
	ave			
	1			
	2			
	3			
	ave			

Is the reaction time longer or shorter than for your hand?

How far will the car travel at 75 mph before you even begin to lift your foot off the accelerator? Show the calculation below:

Make a list of at least three interesting things that require a quick reaction time to be successful: