

LAB 1: Reaction Time*

Equipment List:

meter stick or metric ruler

Purpose: To gain experience using kinematics principles in calculations and to calculate your reaction time and compare it to the reaction times of the class.

Theory: If an object is released from rest the distance it falls in a time t is given by the equation:

$$d = \frac{1}{2}gt^2 \quad (1)$$

where g is the acceleration due to gravity ($g = 9.8 \text{ m/s}^2$). In this experiment, you will rearrange this formula to find t , your reaction time, given d , the distance a ruler falls before being caught.

Theory Exercise: Rearrange equation (1) to give an expression for t in terms of d and g .

Experimental Procedure:

1. To measure your reaction time, place your forearm on the lab bench with your hand overhanging the edge. (This is to prevent you from moving their arm downwards when you see the ruler fall.)
2. Your partner will suspend the ruler or meter stick between your thumb and finger, held about 1 cm apart, so that the zero mark (or another convenient value) is precisely at the level of the top of your fingers. Then (s)he will drop the ruler suddenly and without any audible warning while you attempt to catch it as quickly as possible.
3. Record the distance the ruler fell.
4. Repeat 10 times.
5. Calculate your reaction time for each run (be careful with units!) and then calculate your average reaction time.
6. Change places with your partner and repeat steps 1 – 5.
7. Put your average reaction time and age on the board, for the class to compare the data.

*Based on lab by Prof. Luna.