

Name: _____ Date: _____ Block: _____

Free-Fall Lab 1: Measuring Reaction Time

Conceptual Physics

Objective: Measuring your reaction time

Basic Concept

- A person's reaction time is a measure of how quickly they can respond to a given stimulus.
- How long it takes to react to a rebound could mean the difference between a win and a loss. How long it takes to react to a stopped vehicle can mean the difference between a safe stop and a collision.
- It is important to know your limitations before it becomes a life and death situation
- Since an average human reaction time is only a fraction of a second, it would be impossible to measure it directly.
- By using the known properties of gravity, we can determine how long it takes a person to respond to the dropping of an object by measuring how far the object can fall before it is caught

Materials 1 meter-stick

Procedures Work in pairs to complete the following steps:

Lab I – Measuring ‘Visual Reaction Time’

- Student-A holds a ruler and student-B prepares to catch it
- When student-A drops the ruler, student-B catches it and measures the length
- Repeat this procedure 3 more times and record the measurement in the data table
- Switch partners and repeat procedures i) ii) iii)

Lab II – Measuring ‘Auditory Reaction Time’

- i) Student-A holds a ruler and student-B prepares to catch
- ii) Student-B must have his/her **eyes closed**
- iii) Student-A drops the ruler and at the same time says ‘drop!’ to student-B
- iv) Student-B catches it **by listening** to student-A and measures the length
- v) Repeat this procedure 3 more times and record the measurement in the data table
- vi) Switch partners and repeat procedures i) ii) iii)
- vii) Use $t = \sqrt{\frac{2d}{g}}$ to calculate the reaction time (use $g=9.8m/s^2$)

Data

		1	2	3	4
Visual	Length(m)				
	Reaction Time(sec)				
Auditory	Length(m)				
	Reaction Time(sec)				

Average Visual Reaction time = () seconds

Average Auditory Reaction time = () seconds

Do you react faster to visual cues or audible cues?