Date of Lab 9/22 Date of Submission 9/29

Physics Laboratory Report

Title Free Falling

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Date	Summary	Teacher
9/29/2010	This lab was to see if the gravatational acceleration is really 9.807 m/s². My results were not exactly the same, but they weren't that far apart. I learned that accurate experiments are extremely hard to do.	Comment

* レポートは、日本語あるいは英語で記載すること。 * この用紙をレポートの表紙として使うこと。
* 実験日から一週間目にあたる日までにレポートを提出すること。ただし、その後内容を付け加えて行っても良い。付け加えたときは、上に日付と内容を書くこと。

Lab # 2

11K Chihiro Shibuta

Free Falling

Introduction

Objective: The objective of this lab was to see if the gravitational acceleration of the falling droplet is really 9.807m/s^2.

Hypothesis: The gravitational acceleration is 9.807m/s^2.

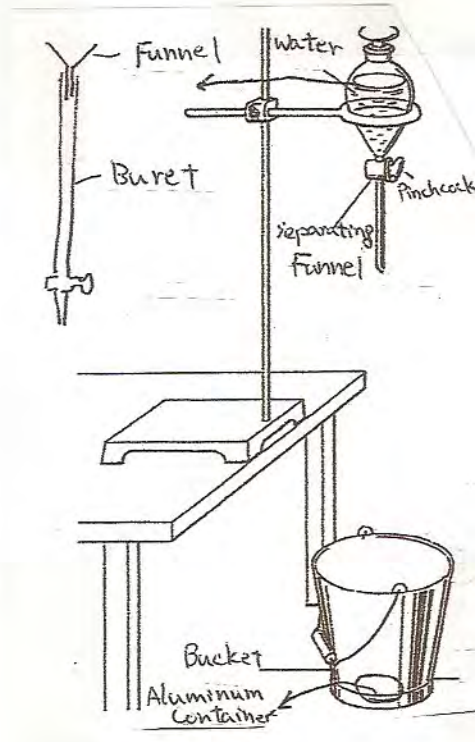
Experiment

Apparatus: * Water
* Buret
* Funnel
* Separating Funnel
* Pinchcock
* Bucket
* Aluminum Container
* Stopwatch

Method: Place the separating funnel about 1.50 meters away from the ground. Then, put an aluminum container in the bucket, and place the bucket below the separating funnel. You place the aluminum container, so that it makes a sound when the water droplets fall in the bucket. After you are done setting up, put water inside the separating funnel, and adjust the timing of the dripping water using the cork on it, so that each droplet of water will come out at the same time as the droplet before touches the aluminum container in the bucket. Now you are ready to start the experiment. Using a stopwatch, record the time it took for 20 droplets to fall onto the aluminum container in the bucket. After you are finished recording, calculate the amount of time it took for 1 droplet to fall onto the aluminum container in the bucket.

OK.

How to set up the experiment. →



Important Equations Used in this Experiment

✤ $s=1/2gt^2 \cdots\rightarrow g=2s/t^2(m/s^2)$

Result

Falling Distance (m)	Time it Took for 20 Droplets to reach the aluminum container in the bucket (s)											Falling Time (s)	Gravitational Acceleration (m/s^2)
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Average		
1.520	11.88	12.25	11.31	10.03	12.31	12.49	10.56	11.34	11.06	11.62	11.49	0.5743	9.219

My hypothesis, which was that the gravitational acceleration would be $9.807m/s^2$, was not correct, but I think that it was not completely wrong either. The number I got which was $9.219m/s^2$, was somewhat close to $9.807m/s^2$.

Discussion

The difference between the result I got from the experiment, and my hypothesis was $0.5880m/s^2$. I think that this difference occurred from the lack of accuracy during the experiment. My partner and I were just relying on our ears, for listening to when the droplets fell on the aluminum container in the bucket, and our hands to stop the stopwatch. Even though human beings can create an extremely accurate machine, which barely make mistakes, human beings itself

The observed value, 9.219 m/s², can be compared with the reported value, 9.807 m/s², in the textbook. Their comparative difference is 6.0% as shown below.

$$\frac{9.807 - 9.219}{9.807} \times 100 = 6.0\ (\%)$$

このように書くと客観的な書き方になる。

can never be that accurate. Furthermore, maybe a professional scientist, who has lived all their lives doing experiments could get a very close number to the actual number that an accurate machine has calculated. However, we are ordinary students who hadn't had that much of a chance to do that many experiments in our lives. I think that these are the 2 main reasons why the difference came out to be 0.5880. Maybe if my partner and I had done the experiment in a silent room, where we could only hear the sound of the droplets falling, our results could have been a little more closer to 9.807m/s².

Conclusion

Although my experiment result and the hypothesis was not completely the same, I am satisfied with what I got. The difference between the 2 numbers was less than 1.000m/s². I personally thought that this wasn't such a bad number.

My Opinion

Most of all, I had fun with this experiment. I don't know why, but I like experiments which involve in using liquids. I hope that there would be other experiments later on in the year where we use water.

よいレポートです。
Taka

Reference

http://www.google.co.jp/intl/ja/help/features.html#calculator

http://aralatan.net46.net/Separating_Funnels.html

http://www.dimensionsguide.com/dimension of a filter funnel/

Teacher's Handout