

Purpose:

- To demonstrate a scientific method and show the different types of variables.
- To determine how mass and length affect the period of a pendulum.

Materials: String (100 cm long), washers, meter stick

Procedure:

Part I – Constructing a Pendulum (everyone does this part):

1. Tie a washer to one end of the string. Slide another washer down the string over the first washer.
2. Measure up 40 cm from the washers. This is where you will hold the string at first.
3. Let the string with the washers hang freely from your outstretched arm.
4. Pull the string and washers straight out to the side. Then let the masses swing back and forth. You have now made a **pendulum**. Movement **back and forth is one swing**. Practice counting a few swings.
5. Now repeat step #4 and count the swings in 30 seconds. Write down this number in the table on the data sheet under **Control Data**. Do this two (2) more times. Now average the three numbers and write it in the AVG blank.
6. Proceed to *either* Part II or Part III. Ask your teacher if you aren't sure which to do.

Part II – How mass affects swing time.

7. Change the number of washers. Add a washer, **KEEP THE LENGTH OF THE STRING AT 40 cm**, and perform #4 and #5.
8. Change your variable again and collect data again 3 times. Make sure that all the other factors remain the same.

Part III – How length affects swing time

9. Change the length of the pendulum. Make the pendulum longer, **KEEP THE SAME NUMBER OF WASHERS ON THE STRING**, and perform #4 and #5.
10. Change your variable again and collect data again 3 times. Make sure that all the other factors remain the same.

Part IV (everyone does this part)

11. Graph your data on the data sheet
12. Answer the rest of the questions on the data/question sheet

Post Lab Discussion:

We will discuss variable, as well as the effects of mass and length on the results.

DATA AND QUESTION SHEET

1. Which variable are you testing, mass or length? _____
2. Write your **HYPOTHESIS**: _____

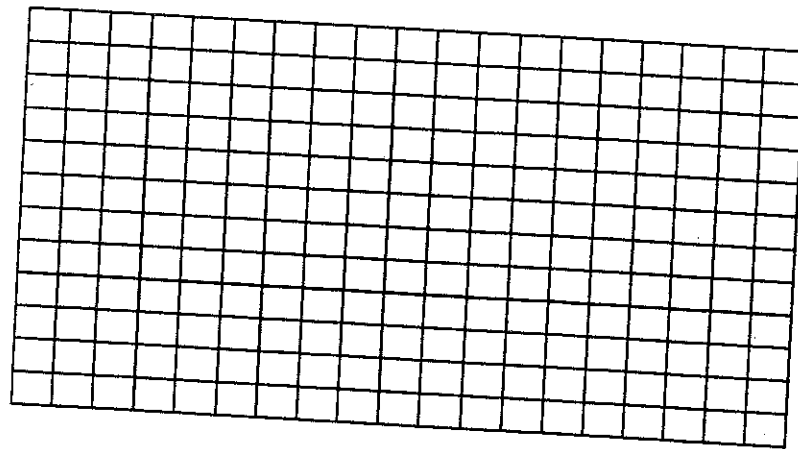
3. Collect your data here: _____

Control data:	Experimental data:		
___ Washers ___ cm	___ Washers ___ cm	___ Washers ___ cm	___ Washers ___ cm
1. _____	1. _____	1. _____	1. _____
2. _____	2. _____	2. _____	2. _____
3. _____	3. _____	3. _____	3. _____
AVG _____	AVG _____	AVG _____	AVG _____

4. For your experiment, what was your *independent variable*? _____
5. What was the *dependent variable*? _____
6. What were some *controlled variables*? _____

7. Graph the results:
- Label the (x-axis) with the name of your _____ variable.
 - Label the (y-axis) with the name of your _____ variable.
 - Label the top of your graph with a title that describes what the experiment is about.
 - Plot your datum point for the control data.
 - Plot your data for your experiment.

Title _____



8. Compare your results with a group that investigated a different independent variable. Which factor or factors changed the frequency of the pendulum?
9. Which factors did not change the frequency of the pendulum?
10. Why did you change only one variable at a time for the experiment?
11. Using your graph, choose a value for your independent variable that you did NOT actually test. Predict the number of swings that you would record at that new mass/length.

Sample Lab Report

Increasing Plant Growth

Problem: How can we make a plant grow taller?

Hypothesis: I think by adding fertilizer to water and then watering a plant with it, the plant will grow taller.

Materials:

2 identical plants of the same size

Fertilizer

Water

2 containers

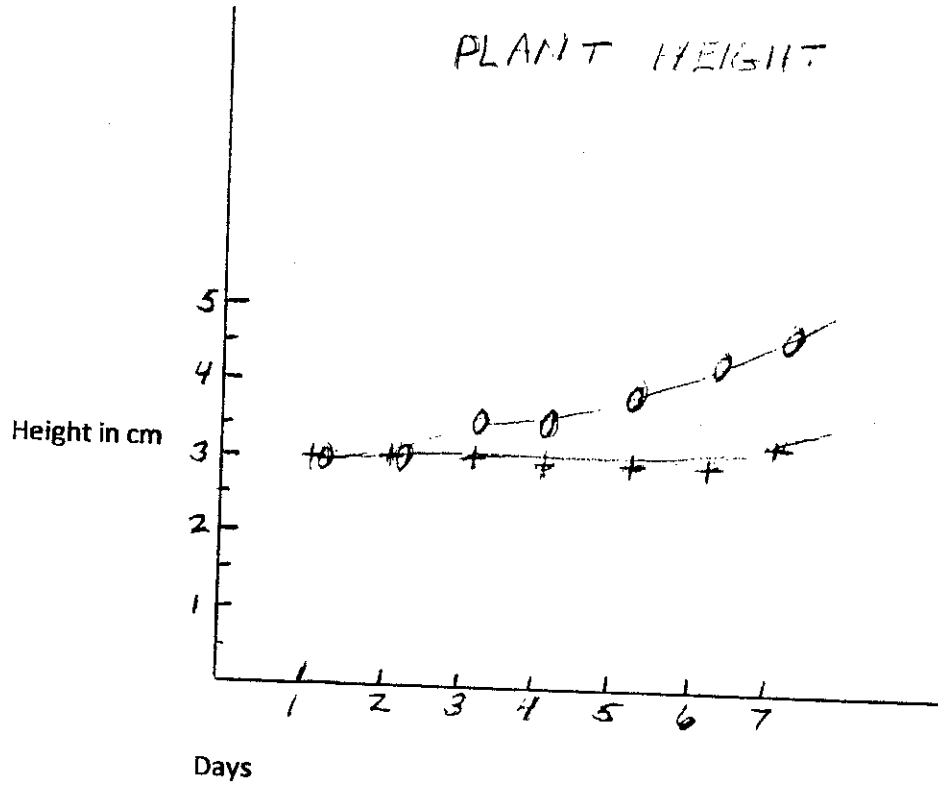
Metric ruler

Procedure:

1. Label one plant A and one plant B.
2. Label one container A and fill it with plain water.
3. Label one container B and mix fertilizer and water in it.
4. Place both plants in a place where they will receive the same amount of light and be at the same temperature.
5. For one week, use container A (plain water) to water plant A everyday.
6. For one week, use container B (water and fertilizer) to water plant B everyday.
7. Measure the height of each plant for one week and record them in the data table.

Data

Day	Plant A	Plant B
1	3 cm	3cm
2	3cm	3cm
3	3cm	3.5cm
4	3cm	3.5cm
5	3cm	4cm
6	3cm	4.5cm
7	3.5cm	5cm



Plant A ++++++

Plant B 0000000000

Conclusion and Analysis:

In conclusion, my hypothesis was correct. The fertilizer did help the plant grow taller. Based on the data I collected, Plant B which had the fertilizer grew a total of two centimeters over a one week period. Plant A which had only water added to it, grew only 0.2 centimeters in one week. The data I collected supports my hypothesis that fertilizer did help my plant grow taller.

