

Pendulum Lab

The value for gravity that is found on your data sheet (9.81 m/s^2) is actually the average across Alberta. The true value of the acceleration due to gravity varies from place to place. Although the value does not change very much (you won't "feel" heavier in Calgary and lighter in Grand Prairie), the differences are measurable and important when performing delicate physics experiments.

Purpose

The purpose of this lab is to measure the acceleration of gravity in Edmonton. To accomplish this, you will use a simple pendulum (made out of thread and a weight tied to the end), a metre stick, and a stopwatch. By measuring the period of a pendulum with a measured length, you will be able to calculate the acceleration due to gravity using the formula:

Procedure

There are a few things to consider when you come up with your procedure for this lab:

1. This formula is only reliable and accurate for angles of at most about 15° away from the equilibrium point.
2. You **MUST** do the lab using several different length pendulums. I would suggest that you do at least five different lengths, and try to do about three trials for each length (that's a total of at least 15 trials).
3. It is quite difficult to measure the exact period of just one swing. *Hint: If I asked you to measure the thickness of a piece of paper, you would measure the thickness of, say, 100 pages in a book, and then divide that number by 100.*
4. You **MUST** graph your data (don't forget to linearize) and **use your slope** to determine the value of gravity.

Post-Lab Questions

There are two questions that go at the end of the lab after the conclusion:

- 1) If Galileo tried to do this same lab in his time, what major difficulty would he have had.
- 2) If you did this same lab on the moon, how would your observations be different.