Simple Pendulum

> I never dreamed of learning that one and the same body, when suspended from a string a hundred cubits long and pulled aside through an arc of 90 degrees or even 1 degree or ½ degree would employ the same time in passing through the largest of these arcs.
>
> Galileo "Dialogues Concerning Two New Sciences"

Queries

- Is Galileo correct? Is the period independent of amplitude?
- Does the period depend on mass?
- Does the period depend on length?

Design and carry out an experiment to determine (experimentally) a simple equation for the period of a pendulum.

Equipment

You may find the following equipment useful.

- Various masses to use as pendulum bobs (film canisters with bird shot work well)
- String and sticky tape
- Meter stick and ruler
- Stop watch (or use your heart rate like Galileo)
- Protractor
- Stand hardware (or a friend with a steady arm)

Mass	m
Length	L
Period	T
Angle	θ

Background

A simple pendulum consists of a mass suspended by a non-stretching string of variable length. The period is the time for the mass to go from one side of its swing to the other side and back again. The angle (or amplitude) of the swing is measured between the pendulum in its vertical (resting) position and at either extreme of its swing. The length of the pendulum is the distance from the point of suspension to the center of the pendulum mass.

Bonus

Does a physical pendulum (a rigid rod with a mass on the end) have the same period as a simple pendulum?

What is due?

Write up a one page summary report of your experiment (or two pages if you have a couple big graphs). Outline your methodology and include your data (appropriately presented). Your conclusion should state what you found and what you think is reasonable. Make sure to include your names. The more people in a group the higher the quality I will expect. DUE Thursday 9:00am (prior to lab)

NOTE: You will have both Monday and Wednesday during the lecture to work on this if you want. The equipment will be placed in the lab room after lecture on Monday.