

Pendulum Lab

Today you will investigate the variables that affect the period of a pendulum. You should quantitatively investigate the affect of mass and string length. Change each variable separately and make sure that you take enough data. I recommend a minimum of 3 trials each of 5 different string lengths and 3 trials each of 5 different masses, for a minimum of 27 trials.

This lab will focus on data analysis. You will need to complete the following:

- 1) Neat labeled data table or tables that include all raw data, uncertainty, and processed data.
- 2) A sample calculation of each type of calculation that you do.
- 3) 3 graphs that include all the components of a good graph, including uncertainty and a descriptive annotation. We will go to the computer lab to do the graphs using LoggerPro. One of the graphs will be a modified graph of string length. We will walk through the steps of this in the computer lab.
- 4) Finally, write a "Master Equation" for the period of a pendulum in relation to string length. Turn in by the end of the period on _____.

Spring Inquiry

Now you will apply what you learned earlier to do a Spring Inquiry Lab. In this lab, you will need to write a full write-up, including problem statement, hypothesis, background, etc. Refer to your lab write-up hand-out for further details.

In this lab, you only need choose one factor that you think may affect the period of a mass-spring system. You will have sets of 5 springs to use. Your lab needs to be completely written by you. You may perform the lab by yourself or with one other person. You will not be able to take data until your pre-write (and that of your partner if applicable) has been checked off.

Pre-write should include everything up to the data table, although it is expected that your original procedure may not include all the details that your final procedure will have. Data analysis should be thorough and you can use the pendulum lab as a model. Make sure that you use data to back yourself up on the conclusion, that you attempt to explain the results using science concepts, and that you specifically address sources of error and uncertainty. These are only a few reminders. Make sure that you use the Lab Write-Up guidelines when you write up your lab.

Timeline:

- 1) Get pre-write checked off and take data: _____
- 2) 2nd Draft (first complete draft) due _____ for color-marking. It should be typed.
- 3) 3rd and final Draft due _____. Turn in color-marked version with it.