# What Affects the Period of a Pendulum?

## Taking the Data

In the previous pre-labs and labs you have considered how to effectively set up your experiment to maximize its accuracy. You have also considered the requirements for data that will be used to analyze the relationship between two variables. In this prelab you will collect the data for your experiment. As you do so, it will be important to document your work carefully: in science, an experiment is useless unless it is well documented!

### Getting Ready

1. Take some time to consider the suggestions you received from your lab instructor in your feedback from Pre-lab 1, as well as feedback you got from your peers in Live Lab 1, and what you learned about how to collect effective data in Live lab 2. Describe how you have changed your experimental procedure in response to the feedback you received.
2. Make a data sheet (using a spreadsheet is a good idea) with the initial setups of amplitude and length you will use for each trial listed. Remember that we must vary both amplitude and length substantially to get enough data to evaluate the effects of these factors. Also remember that to test the effect of one variable you need to change it while holding the other variable constant. This means you don’t need to test every possible combination of amplitude and length! Submit your blank data sheet here.

### Taking the Data

Now it’s time to collect the data! As you collect the data, keep an organized record (electronically is easiest) of the initial conditions and results for each trial. Also note any unusual behavior or other things you observe during the experiment.

1. Submit your log of unusual behavior or other qualitative observations about the motion here. (Don’t discuss the results here: just things that you saw).
2. Submit your filled-in data sheet here.
3. Estimate a numerical value (in degrees) for the uncertainty in your angle measurements, and explain your estimate.
4. Estimate a numerical value (in cm) for the uncertainty in your length measurements, and explain your estimate.
5. Estimate a numerical value (in seconds) for the uncertainty in your time measurements, and explain your estimate. Note that if you are measuring the time for say, 5 swings of the pendulum, you want to estimate the uncertainty in your measurement of the time for the entire 5 swings, not the uncertainty in the time for one swing.

There is no need to start the data analysis yet: that is what we will do in the Live lab!