

Investigating a Pendulum

Partner(s) First and Last names _____

Section _____

Date _____

Time _____

A simple pendulum is a mass suspended on a string or cord attached to a support on the opposite end. The purpose of this experiment is to observe what factors effect the period (T) or frequency (f) that the pendulum will oscillate. There are basically three things we can change about a pendulum: the mass, the amplitude, and the length. *We will vary these (one at a time) and see what effect they have on the pendulum's movement (in particular its period).* The time required for one complete vibration, for example, from one crest to the next crest, is called the pendulum's period and is measured in seconds. As seen in this diagram, the length of the pendulum is measured from the pendulum's point of suspension to the center of mass of its bob. Its amplitude is the string's angular displacement from its vertical or its equilibrium position. If a pendulum is pulled to the right side and released to swing back and forth, its path traces a sine curve as shown below. Pick a set of conditions and record the period for **set 1**.

For **set 2**, select only one of the variables to be different from set 1. Record your hypothesis for the manner in which the period will change, if any, based on the singular variable change. Run 3 tests on the new set of conditions and record the period. Record any noteworthy observations. Based on the data collected, analyze your data as it relates to your hypothesis. For **set 3**, select a different variable to change. Record your hypothesis as to the period change resulting from the variable. Record your new period data and analyze based on your hypotheses.

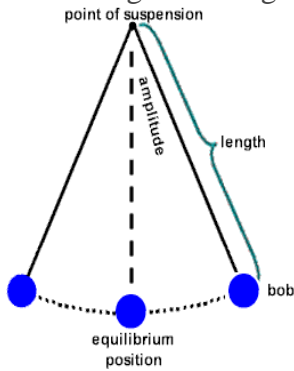


Figure 1 Simple pendulum

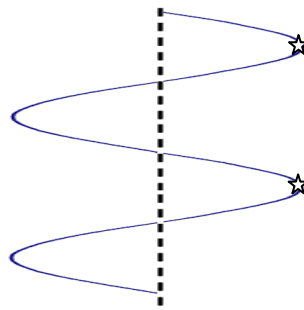


Figure 2 Cycle (star to star)

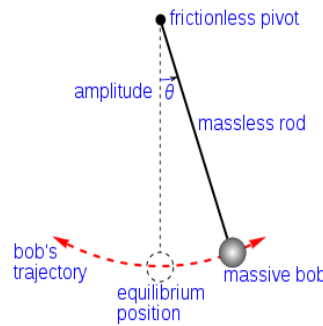


Figure 3 Simple pendulum



Figure 4 Bob

	Mass (grams)	Amplitude (cm)	Length (cm)	Period (cycle/sec)			
Set 1 Conditions				1 cycle/time	3 cycle/time	5 cycle/time	Average
Set 2 Conditions compare 1→2				1 cycle	3 cycle	5 cycle	Average
Hypothesis							
Result							
Sources of error							
Set 3 Conditions compare 1→3				1 cycle	3 cycle	5 cycle	Average
Hypothesis							
Result							
Sources of error							