

LAB: THE PENDULUM

DATE _____ PERIOD ____

LAB PARTNERS: _____, _____, _____, _____

A pendulum completes one cycle or oscillation when it swings from a position of maximum deflection and then **back** to that position. The time it takes to complete one cycle is called its **period**.

1. Obtain a string and two different masses, and informally experiment with a pendulum to provide yourself with an experimental basis for circling the correct response in each of the three cases below.

MASS - Increasing the mass of a pendulum while keeping the length and amplitude constant will have which of the following effects on the period?

- a. increasing mass will increase period
- b. increasing mass will decrease period
- c. mass has no effect on period

LENGTH - Increasing the length of a pendulum while keeping the mass and amplitude constant will have which of the following effects on the period?

- a. increasing length will increase period
- b. increasing length will decrease period
- c. length has no effect on period

AMPLITUDE - Increasing the amplitude of a pendulum while keeping the mass and length constant will have which of the following effects on the period?

- a. increasing amplitude will increase period
- b. increasing amplitude will decrease period
- c. amplitude has no effect on period

2. **PROCEDURE & GRAPHING** - Set up a pendulum so that you can keep the mass and amplitude constant while varying the length. Take data on period vs. length for the lengths indicated in the table below. Measure time for 5 complete swings, and divide by 5 to get the value for a single period. Record period to nearest 0.1 second.

L (m)	0.00	0.10	0.20	0.30	0.40	0.50	0.70	0.90	1.10	1.30	1.50
T (s)	0.0										
\sqrt{L}											

3. Plot a graph of Period vs. Square Root of Length.

(a) Use Period on y-axis, \sqrt{L} on x axis .

(b) Find a linear best fit straight line for your graph. Write the equation for your line in the form $y = mx$

$y = mx \quad \square \quad T = \text{_____} \sqrt{L}$

Copy equation on page 135 in text:

Rewrite in form $T = (value)\sqrt{L}$

How do the 2 equations compare:

4. Circle the correct answers, based on the form of the equation in your textbook:

(a) If the length of the pendulum is doubled the period will be (increased) (decreased). The new period will be: (4) (2) (1.4) (0.5) (0.25) times the original period.

(b) If the value of "g" increases, the period will (increase) (decrease).