

Name \_\_\_\_\_  
Science \_\_\_\_\_

Date \_\_\_\_\_  
LAB: Sc. M & Graphing

# Stop! It's Pendulum Time



An object swinging at the end of a string forms a pendulum. In this investigation, you will let a hex nut swing from different lengths of a string. For each length, you will count the number of swings the pendulum makes in one minute. This value represents the frequency of the pendulum's motion. Then you will graph your data and use the graph as the basis for predicting frequency values for pendulum lengths you did not actually measure.

**Pre-lab:** Do you need to exercise caution in using any materials or performing any steps? If so, which ones?

---

I. **Problem:** Does the length of the string affect a pendulum's frequency?

II. **Research:** According to \_\_\_\_\_ (source) the frequency of a pendulum is \_\_\_\_\_

III. **Hypothesis:** Design one using an "If, then" statement.

---

**Materials:**  
Goggles

String, 1-m long  
Hex nut



Graph paper  
**Ruler**



Masking tape  
Stop watch

Meters stick  
**Pencil**



IV. **Experiment:**

1. Construct a data table on your graph paper using a **ruler**. The variables with their units are **Pendulum Length (cm)** and **Number of Complete Swings (in 1 minute)**. The Pendulum lengths are 30, 40, 50, 60, 70, and 80.
2. Obtain the materials found above. Using the meter stick, measure the point on the string that is 30 cm from the center of the hex nut. Place a piece of masking tape across the string at that point. Use the masking tape to suspend the pendulum from the side of a table or meter stick.
3. Hold the pendulum hex nut about 10 cm to the side and release it. Make certain the hex nut swings freely. Count the number of complete swings in one minute. \* **A complete swing is from the point of release to the other side and back to the same point.** Record your quantitative observation in the table that you constructed.
4. Change the length of the pendulum to 40 cm. Count the number of complete swings in one minute. Record your quantitative observation.
5. Repeat the measurement of the number of complete swings with the pendulum length at 50 cm, 60cm, 70 cm, and 80 cm. Be sure to record your quantitative observations.
6. Construct a line graph of your data on your graph paper with the data table on it.

