The Scientific Method and Controlled Experiments.

Purpose:

In this activity we will be performing a very simple experiment to determine how the LENGTH OF A PENDULUM affects the PERIOD OF A PENDULUM.

Hypothesis:

Materials:

 ~1.5m length of string 200g mass

 ring stand stopwatch

 beaker/flask ring masking tape

Procedure:

 INDEPENDENT VARIABLE:

 DEPENDENT VARIABLE:

 CONTROLLED VARIABLES:

 **1.** Set up the apparatus as shown in class.

 **2.** Start with the longest length of pendulum. Measure length from the point the string attached to the ring to the bottom of the mass.

 **3.** Pull the pendulum to one side, through a small angle (~30o) by holding the mass.

 **4.** Release the mass.

 **5.** Observe the swings to get an idea of the rhythm. Watch closely for the point where the pendulum changes direction (maximum displacement).

 **6.** Stop the swing.

 **7.** Pull the pendulum to one side again. Realease.

 **8.** When the pendulum reaches one sides maximum displacement start the stopwatch and start counting from ZERO.

 **9.** Measure and record the time for ten (10) complete swings from one side to the other, ***and back again***.

 **10.** Repeat steps 3-9 for all other lengths.

OBSERVATIONS:

DATA:

|  |  |  |
| --- | --- | --- |
| **Length (cm)** | **Time for 10 Swings (s)** | **Period (s)** **(Time for 1 swing)** |
| **140** |  |  |
| **100** |  |  |
| **60** |  |  |
| **40** |  |  |
| **30** |  |  |
| **20** |  |  |
| **15** |  |  |
| **10** |  |  |

ANALYSIS:

 1. Complete the table above by determining the period of ONE SWING for each length.

 2. Draw a graph with the INDEPENDENT VARIABLE on the horizontal (x) axis, and the DEPENDENT VARIABLE on the vertical (y) axis.

 3. From the graph does there appear to be a relationship between the two variables?

 4. Does it appear to be a positive correlation, a negative correlation or no correlation?

 5. Does it appear to be linear?

 6. Do you think there are any possible sources of error in this lab? In other words, can you think of any possible reasons that the results might be slightly different if you were to repeat the same procedure?

The Scientific Method and Controlled Experiments.

Purpose:

In this activity we will be performing a very simple experiment to determine how the MASS OF A PENDULUM affects the PERIOD OF A PENDULUM.

Hypothesis:

Materials:

 ~1.5m length of string 1 x 100g, 2 x 200g mass

 ring stand stopwatch

 beaker/flask ring masking tape

 Styrofoam/Paper cup

Procedure:

 INDEPENDENT VARIABLE:

 DEPENDENT VARIABLE:

 CONTROLLED VARIABLES:

 **1.** Set up the apparatus as shown in class.

 **2.** Put the 100g mass into the cup.

 **3.** Pull the pendulum to one side, through a small angle (~30o) by holding the cup.

 **4.** Release the cup.

 **5.** Observe the swings to get an idea of the rhythm. Watch closely for the point where the pendulum changes direction (maximum displacement).

 **6.** Stop the swing.

 **7.** Pull the pendulum to one side again. Realease.

 **8.** When the pendulum reaches one sides maximum displacement start the stopwatch and start counting from ZERO.

 **9.** Measure and record the time for ten (10) complete swings from one side to the other, ***and back again***.

 **10.** Repeat steps 2-9 with other mass combinations as shown in the table below.

OBSERVATIONS:

DATA:

|  |  |  |
| --- | --- | --- |
| **Mass (g)** | **Time for 10 Swings (s)** | **Period (s)** |
| **100** |  |  |
| **200** |  |  |
| **300** |  |  |
| **400** |  |  |
| **500** |  |  |

ANALYSIS:

 1. Complete the table above by determining the period of ONE SWING for each length.

 2. Draw a graph with the INDEPENDENT VARIABLE on the horizontal (x) axis, and the DEPENDENT VARIABLE on the vertical (y) axis.

 3. From the graph does there appear to be a relationship between the two variables?

 4. Does it appear to be a positive correlation, a negative correlation or no correlation?

 5. Does it appear to be linear?

 6. Do you think there are any possible sources of error in this lab? In other words, can you think of any possible reasons that the results might be slightly different if you were to repeat the same procedure?