A Study of the Pendulum

In this activity you will carefully study the factors which affect the time required for a pendulum bob to make one back and forth swing. The time required for such a swing is called the period of the pendulum.

Some possible ways to alter the period of a pendulum would be to change the length of the pendulum string, the mass of the pendulum bob, and the height to which the bob is raised prior to measuring the period.

Using the steps in the scientific method, you are to devise a plan to test each factor and obtain data to analyze and draw a conclusion as to how each factor changes the period of the pendulum.

Equipment which is available is given below:

Pendulum support
Ring stand
String and scissors
Washers of various sizes to be used as pendulum
Meter sticks
Balances
Stopwatches or phones used as timers


SPLIT · RESET
SET
START · STOP
SELECT
MIN.
SEC.
1/100S.
SPORTS TIMER
sportsmanship

Your group should follow the format given below *for each factor tested*.

Question: How is the period of a pendulum affected by changes in _____?

Hypothesis: We think as the _____gets larger, the period of the pendulum will_____.

Experiment: Briefly describe your experimental set up and how you plan to change the factor you are testing. You will need to measure the time required for 10 swings and divide by 10 to obtain the time for 1 swing. (Why?)

Data Table:

Factor tested	Time for 10 swings	Time for 1 swing

Analysis of Data:

Conclusion:

Did you prove your hypothesis?

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Period of a Pendulum results:

Data Table: For Mass of washers = 40.64 g

Factor tested LENGTH	Time for 10 swings, Sec	Time for 1 swing
26 cm	10.03, 9.90, 10.19, 10.13	
42 cm	13.06, 12.56	
70 cm	16.41, 16.66	
The longer the length, the longer the period of the pendulum		

Data Table:

Factor tested MASS of BOB	Time for 10 swings	Time for 1 swing
40.64 g, 70 cm	16.41, 16.66	
82.44 g, 70 cm	16.94, 16.75	
40.64 g, 42 cm	13.06, 12.56	
82.44 g, 42 cm	12.97, 12.90	

From my data, it appears that the length of the string was the factor that determined the period of the pendulum.