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Simple Harmonic Motion Lab Report

Purpose:

The purpose of this lab is to calculate g using the equation T=2π(I/mgd)^(1/2). To do this, we must manipulate the equation to have g as part of the slope. This will linearize the data, making it much easier to calculate g.

Materials:

-Meter Stick

- Modeling Clay

-Calculator

-Appropriate Physics Program on Calculator

-Motion Detector

-Paper Clip

-Wooden Blocks (as necessary)

-C clamp

Data:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| d (m) | T1 (sec) | T2 (sec) | T3 (sec) | T(av) | (1/12 +d^2)/d | T(av)^2 |
| 0.15 | 1.696 | 1.698 | 1.699 | 1.697667 | 0.705555556 | 2.882072 |
| 0.25 | 1.54 | 1.538 | 1.538 | 1.538667 | 0.583333333 | 2.367495 |
| 0.49 | 1.636 | 1.637 | 1.636 | 1.636333 | 0.660068027 | 2.677587 |

Graph:

**Conclusion:**

To find g, we use the equation T^2= (4π^2/g)\* (1/12 +d^2)/d. All we need in this equation is (4π^2/g), and we set this equal to the slope on the graph, 4.1925. Solving for g we get a value of 9.416 m/s^2. This is a pretty good value, considering only three points were taken. Although the data looked strange when it was taken, when graph, it formed a fairly straight line, resulting in a good value of g. Since the real value of g is 9.81, 9.416 m/s^2 is a good estimate in this setting. The percent error is 4.02%, which is a relatively low percent error. This means we can accept this data as accurate. To calculate this, I used this formula (9.81-9.416)/9.81. Also, other factors such as the modeling clay could have affected the data results; since it is possible it prohibited the simple harmonic motion of the meter stick by attaching itself to it.