

The Simple Pendulum

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Aims and Objectives

Scientific Aims

- Measure the period of a simple pendulum and determine a value for g , the acceleration due to gravity.
- To investigate how the period of the simple pendulum varies with mass of the pendulum bob and the amplitude of the swing.

Learning Outcomes

- Plotting data with uncertainties and drawing a line of best fit*
- Determine the value of g from the slope of the line of best fit and the associated uncertainty in g
- Compare the measured value of g with the accepted value of g (Reference)

Level of Experiment

First year (non-calculus) physics. Students who have not done Physics previously or have not done well in high school.

Keyword Descriptions of the Experiment

Domain

Simple pendulum, acceleration due to gravity

Specific Descriptors

Simple harmonic motion, time period, pendulum length, data analysis, uncertainty propagation, data plotting, slope of line of best fit

Course Context

Hand-on experience is a motivational activity enhancing student's conceptual learning. Background knowledge achieved in lectures is put to test in laboratory activities. In this experiment students will verify theory of simple harmonic motion applied to simple pendulum to determine g . Newton's law of gravitation.

Prerequisite Knowledge and Skills

None but will gain the following as a result of doing this experiment:

Measurement of physical quantities with appropriate precision, uncertainty manipulation, data analysis, graphing data, and interpretation.

Time Required to Complete

Prior to Lab: ? an hour

In Laboratory: 2 hours

After Laboratory: 3 hours

Experiment History

This is a traditional experiment and has been running for many years

Submission Details

Submitted lab notes (Please note, Student notes and Demonstrator notes are the same as Lab notes)

References

Giancoli, D. 2005. *Physics Principles with Applications*. Pearson Prentice Hall

Kirkup, L. 1994. *Experimental Methods – An Introduction to the Analysis and Presentation of Data*. John Wiley and Sons Australia.