

Experiment (5): Simple Pendulum

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Result and Discussions:

The purpose: To determine the acceleration due to gravity “g”

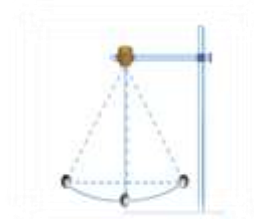
Equipments (Apparatus): Simple pendulum – Metric Ruler – Stop watch –

Theory: A simple pendulum consists of a mass " m" hanging on the end of light string of length “ L”. When the mass is deflected from its equilibrium, it oscillates back and forth. The time for one complete oscillation is called the period time of the simple pendulum. For small angles of deflection the simple pendulum motion described by Simple harmonic motion with period time "T" given by :

$$T = 2\pi\sqrt{l/g}$$

Where: T : the period time in second, s . L : length of pendulum= the string + radius of spherical ball in cm. g : is the acceleration due to gravity

By squaring both sides of the equation yields $T^2 = \frac{4\pi^2}{g} L$



Result:

Length of the sting $l(m)$	Time for 10 Oscillations $T_{10}(s)$	P. T for one oscillation $T = T_{10}/10(s)$	$T^2 (s^2)$

From the graph: (use the graph paper to plot $T^2 (s^2)$ as a function of the length (L,m)

1-Slope $4\pi^2 / g = \dots\dots\dots$

2-The acceleration due to gravity $g = 4\pi^2 / \text{Slope} = \dots\dots\dots m/s^2$

3- percentage error = $\frac{\text{experimental} - \text{theoretical}}{\text{theoretical}} \times 100 = \frac{\dots\dots\dots - 980}{980} \times 100 = \dots\dots\dots$

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