

Physics Experiment Manual: Simple Pendulum

1. precise Purpose

To determine the acceleration due to gravity (g) using a simple pendulum.

We will measure the period of oscillation for different lengths.

2. Theory

The period T of a simple pendulum is given by $T = 2 \pi \sqrt{L/g}$.

Squaring both sides gives $T^2 = 4 \pi^2 (L/g)$.

Thus, a plot of T^2 vs L should yield a straight line with slope $4\pi^2/g$.

3. Error Analysis Guide

Common sources of error include:

- Air resistance: Damps the oscillation.
- Reaction time: Delay in starting/stopping the stopwatch.
- Angle of release: Should be small (< 10 degrees).