

## THEORY

### 1. INTRODUCTION

The purpose of this experiment is to determine the acceleration due to gravity ( $g$ ) using a simple pendulum. The period of oscillation ( $T$ ) of a simple pendulum is related to the length of the pendulum ( $L$ ) and the acceleration due to gravity ( $g$ ) by the equation:

$$T = 2\pi \sqrt{\frac{L}{g}}$$

By measuring the period of oscillation for different lengths of the pendulum, we can plot a graph of  $T^2$  versus  $L$ . The slope of this graph will be used to determine the value of  $g$ .

The apparatus used in this experiment is a simple pendulum consisting of a string of length  $L$  attached to a support, with a mass  $m$  suspended from the other end. The pendulum is displaced from its equilibrium position and released, causing it to oscillate with a constant period  $T$ .

### 2. APPARATUS

The apparatus used in this experiment is a simple pendulum consisting of a string of length  $L$  attached to a support, with a mass  $m$  suspended from the other end.

The following table shows the data recorded during the experiment:

Length of string ( $L$ ) (m)	Period of oscillation ( $T$ ) (s)
0.10	0.63
0.20	0.84
0.30	1.10
0.40	1.26
0.50	1.41

The graph of  $T^2$  versus  $L$  is shown below:



The slope of the graph is used to determine the value of  $g$ .

## EXPERIMENT

1. Set up the simple pendulum as shown in the diagram.

2. Measure the length of the string ( $L$ ) and the period of oscillation ( $T$ ) for different lengths.

3. Plot a graph of  $T^2$  versus  $L$ .

4. Determine the slope of the graph and use it to find the value of  $g$ .

5. Compare your result with the accepted value of  $g$ .

6. Discuss any sources of error in your experiment.

7. Conclude your experiment.

8. Write a report on your experiment.

9. Submit your report to your teacher.

10. Thank your teacher for the opportunity to perform this experiment.

11. Goodbye!

12. Have a nice day!

13. See you next time!

14. Bye-bye!

15. Take care!

16. Stay safe!

17. Love you!

18. Miss you!

19. Remember me to your family!

20. Goodnight!

21. Sweet dreams!

22. See you soon!

23. Bye!

24. Bye-bye!

25. Goodbye!

26. Bye-bye!

27. Goodbye!

28. Bye-bye!

29. Goodbye!

30. Bye-bye!

31. Goodbye!

32. Bye-bye!

33. Goodbye!

34. Bye-bye!

35. Goodbye!

36. Bye-bye!

37. Goodbye!

38. Bye-bye!

39. Goodbye!

40. Bye-bye!