

# [Physics a - lab report example](https://assignbuster.com/physics-a-lab-report-example/)

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## Physics A

Physics Lab A Summary Sheet Objective The aim of this experiment was to ascertain how period of two Simple Harmonic oscillators (pendulum and spring mass system) differ with diverse parameters.
Method
This entailed conducting both pendulum and spring experiments separately to determine their behaviors especially when subjected to diverse parameters. These parameters included varied lengths, angles, and weights both the both the pendulum as well as spring respectively.
Results
Spring and pendulum varied directly with the parameters applied though slight errors emerged during the experiments. These were due to either slight distortions of the equipments or errors when talking measurements.
Applications
The application of these experiments is immensely in the fabrication sectors where engineers construct diverse models to come up with refined designs meant to construct real machines and objects.
Graphs
This section features two graphs;
Weight vs. Extension Graph (F = kx)
Length of the string used (m) vs. Period
Simple Harmonic experiment
Objective:
The aim of this experiment was to ascertain how period of two Simple Harmonic oscillators (pendulum and spring mass system) differ with diverse parameters.
Apparatus
Simple pendulum
Supporting rod, clamp, hook for suspending spring and short rod
2 M stick with Vernier caliper jaws
Cylindrical spring type
Weights (100g, 200g, 300g, 500g)
Stop watch or stop clock
Triple beam balance
Method
Procedure
Pendulum experiment
The first step was to measure the diameter of the metal sphere (2. 5cm) and hanging it from a support with a string of length 0. 6m before displacing it at an angle of 50. Then timing of 50 oscillations followed together with recording of the attained results.
Second step entailed repetition of the initial step but with varying lengths (0. 8m, 1. 0m, 1. 2m, 1. 4m and 1. 6m) coupled with recording oscillations after every 25 vibrations instead of 50 as it was in the first procedure.
Using a 0. 5m length string and tilted at diverse angles (00, 300 and 450) for 50 oscillations, results were tabulated in table.
Spring mass experiment
This experiment entailed hanging the spring instead of string from the support with varying masses at its base (0. 1kg, 0. 2kg, 0. 3kg, 0. 4kg and 0. 5kg). Then displacing each mass in turn from their middle positions, measuring their displacements and tabulating them in a table.
Results
Diameter of the sphere = 2. 55 cm
Radius of the sphere = 1. 275 cm
Table 1: Pendulum statistics
Length of the string used (cm)
Length of the string used (m)
Length of pendulum
No. of vibrations
Time
Period
Square of period
58. 7
0. 587
60
50
77. 545
1. 551
2. 405
78. 7
0. 787
80
50
89. 34
1. 787
3. 193
98. 7
0. 987
100
50
99. 65
1. 993
3. 972
118. 7
1. 187
120
25
55. 14
2. 206
4. 864
138. 7
1. 387
140
25
59. 8
2. 392
5. 722
158. 7
1. 587
160
25
63. 27
2. 531
6. 406
Value of g from the slope = 9. 7w/s
Percent error
Normal earth’s pull = 9. 8w/s
Then, % deviation = (9. 8-9. 7)/9. 8
= 1. 02
Length of the string used = 48. 7 cm Length of pendulum = 51. 2 (48. 7 + 2. 5)
Table 2: Pendulum statistics
Initial displacement of sphere
Number of vibrations
Time
Period
Square of period
50
50
71. 14
1. 422
2. 024
300
50
71. 87
1. 437
2. 066
450
50
73. 61
1. 472
2. 167
Per 0. 25g, Converting to Newtons multiply by 9. 81, Free extension = 6. 47 cm.
Table 3: Spring statistics
Mass suspended from the spring (Kg)
Weight (N)
Force stretching spring (g)
Scale reading
Elongation (cm)
0
0
0
6. 47
0
0. 1
0. 981
100
10. 28
3. 81
0. 2
1. 962
200
14
7. 53
0. 3
2. 943
300
17. 95
11. 48
0. 4
3. 924
400
21. 8
15. 33
0. 5
4. 905
500
25. 45
18. 98
Mass of the spring = 9g, Force constant of the spring = 3. 914n/m
Table 4: Spring Readings
Mass suspended from the spring (kg)
Mass of the vibrating system (g)
Amplitude of vibration
Time for 50 vibrations
Period
Percent discrepancy
Experimental value
Calculated value
0. 2
209
5
28. 29
0. 135
1. 641
11. 2
0. 2
209
10
28. 68
0. 137
1. 641
11. 2
0. 5
509
5
44. 30
0. 087
2. 593
28. 8
Applications:
The application of these experiments is immensely in the fabrication sectors where engineers construct diverse models to come up with refined designs meant to construct real machines and objects. This is to minimize losses, which could have occurred if the specialists ignored small tests in determining how the real design will work.
Graphs
Table 5: Periods Squared (P2) vs. Pendulums Lengths (L)
Table 6: Elongation (E) vs. Weight (W)
Work Cited
Serway, Raymond A., Faughn, Jerry S. & Chris, Vuille. College Physics. Boston, Mass: Brooks/Cole, Cengage Learning, 2011. Print.