

Physics a - lab report example

[Science](#), [Physics](#)



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 taking 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 (P^2) 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.