Date of Lab __12/12__   Date of Submission __1/9__

Laboratory Report

Title Conservation of Mechanical Energy

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Summary

In this lab we did two experiments.
In First experiment (of pendulum) we can see that potential energy of the weight at maximum point and the sum of the kinetic energy and potential energy of the weight is equal. So it can be said, that mechanical energy is conserved.
In Second experiment, of the spring, we can see that the potential energy of the spring and the kinetic energy of the weight is equal. So it can be said mechanical energy is conserved.

· Meet a deadline   · Write logically   · Write clearly   · Write with your own words

Teacher's Comments

Compact and beautiful graphs.

1	2	3	4	5	6	7	8	9
Due	Summary	Intro.	Method.	Results	Table/Fig.	Discussion	Clearness	General

* Use this form as a cover sheet.
* Submit your reports by the seventh day after your lab.

Result

Exp1; Table1 (Mass of Weight **m** =0.033kg)

	Maximum height		Minimum height					(A-B)/A × 100
	h_1	$A=mgh_1$	h_0	v	mgh_0	$1/2mv^2$	$B=mgh_0+1/2 mv^2$	
Exp	m	J	m	m/s	J	J	J	%
1	0.1	0.031	0.05	0.966	0.0157	0.0149	0.031	2.40
2	0.15	0.047	0.05	1.382	0.0157	0.0306	0.046	1.70
3	0.2	0.063	0.05	1.637	0.0157	0.0448	0.060	3.60
4	0.25	0.078	0.05	1.948	0.0157	0.0607	0.076	2.56
5	0.3	0.094	0.05	2,215	0.0157	0.0785	0.094	-0.11

Exp2; Table2 (Gravity of Weight **F=kx**)

m(kg)	0.05	0.1	0.15	0.2	0.25	0.3	0.35
F(N)	0.49	0.98	1.47	1.96	2.45	2.94	3.43
X(m)	0.013	0.03	0.046	0.062	0.077	0.093	0.109

Exp3; Table3

Spring constant **k**= 38N/m   Mass of Weight **m**=0.033kg

	Spring		Weight		
	X	$A=1/2kx^2$	v	$B=1/2mv^2$	$(A-B)/A \times 100$
Exp	m	J	m/s	J	%
1	0.1	0.19	0.7	0.008	95.80
2	0.15	0.428	1.17	0.023	94.63
3	0.175	0.582	2.74	0.124	78.70
4	0.2	0.760	3.83	0.242	68.15
5	0.25	1.180	5.37	0.476	59.66
6	0.275	1.437	5.77	0.550	61.73
7	0.3	1.710	6.61	0.721	57.84

Discussion

In the first experiment, sum of the potential energy and kinetic energy at the heist point and lowest point was almost same. percentage of error shows the sum of the two points are not completely same. But the percentage of error are not large so it can be said that the kinetic energy and potential energy of the weight in the motion of pendulum at the maximum height equal to the potential energy of the weight at the minimum height.

In the second experiment, Graph 2 show shat relationship between e potential energy of the spring and the kinetic energy of the weight connect to the spring. There is small error, so it can be said that potential energy of the spring id equal to the kinetic energy of the weight connect to the spring.
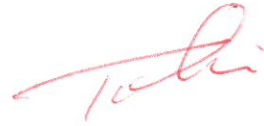
Conclusion

The potential energy at the maximum height is equal to the kinetic energy at the minimum height, and the elastic potential energy of spring is equal to the kinetic energy of an object attached to the spring. So the mechanical energy is conversed in any moving object.
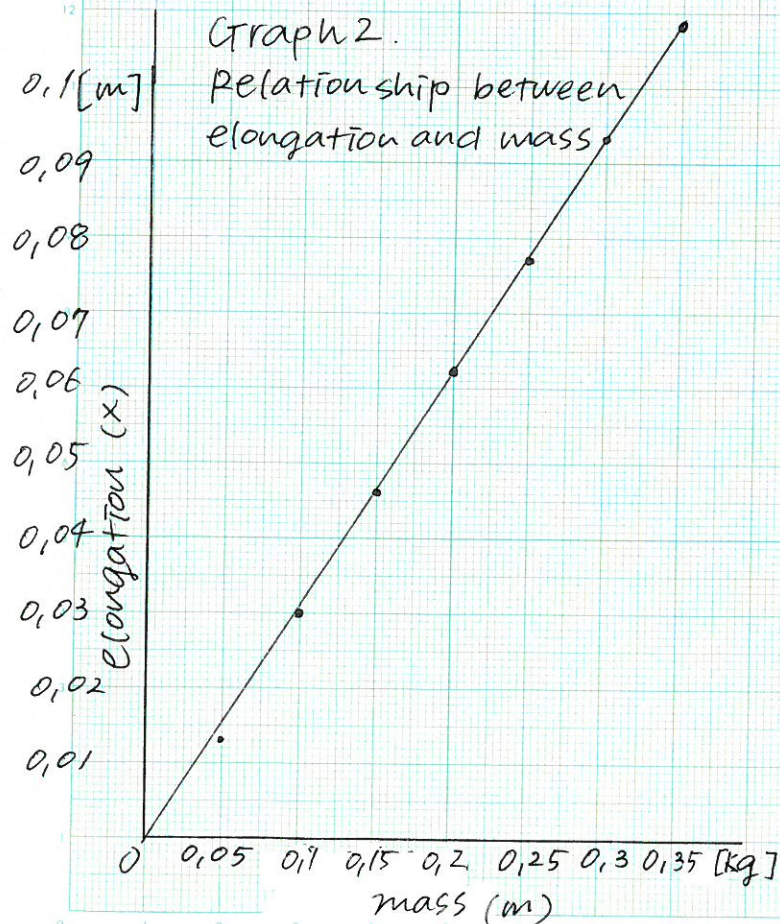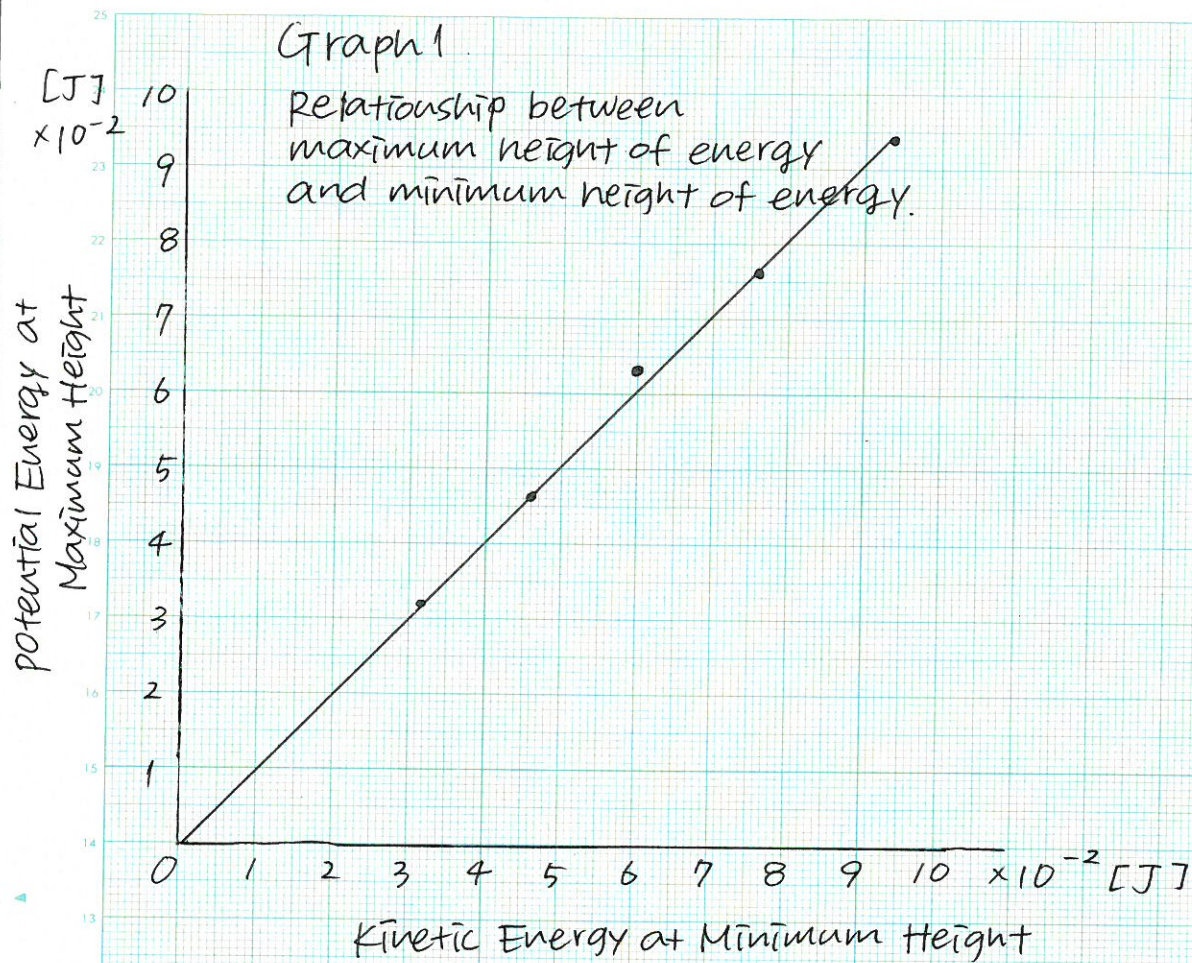
Opinion

When I learned about mechanical energy, I could not understand it. And I could not imagine about potential energy. However, based on the results of this experiment, it was found that the conservation of mechanical energy became established. In addition to learning in class, I thought that I can understand the interest of physics by actually experimenting.

Reference

Ayano Fukuda

Graph 1.

Relationship between
maximum height of energy
and minimum height of energy.

Potential Energy at Maximum Height [J] ×10⁻²

Kinetic Energy at Minimum Height ×10⁻² [J]

Graph 2.

Relationship between
elongation and mass

elongation (x) [m]

mass (m) [kg]

Graph 3

Relationship between Elastic Potential Enegy of spring and Kinetic Energy of the weight

Elastic potential Enegy of spring [J]

2,0

1,5

1,0

0,5

0   0,1 0,2 0,3 0,4 0,5 0,6 0,7 0,8   [J]

Kinetic Enegy of weight