

Name _____
AP Physics
Period _____

Date _____
Lab Activity #6 (75 pts)
Mrs. Nadworny

Partners:

Due Date _____

Energy Stations

NO Lab Write-Up Required
must be neatly written in pencil

Purpose

- To explore the relationship between work and energy.
- To investigate the conservation of energy principle.

Station #1

Bouncing

Research Problem

Diagram

(2)

Include a labeled diagram.

- Drop a ball from shoulder height. Take whatever measurements necessary to calculate the amount of work done on the ball by the surrounding environment.

Energy Statement

(2)

Write an energy statement for this situation.

Data Collection

(4)

Make a clearly labeled table for organizing the raw and processed data that you expect you will collect.

Data Processing

(6)

Include an analysis of the data collected, including sample calculations of processing the data.

Questions

(3)

1. Specify the environmental factors that did work on the ball.

Station #2

Pendulum

Research Problem

Diagram

(2)

Include a labeled diagram.

- Pull the pendulum bob back and then let it go to swing back and forth. Take any measurements that you need in order to calculate the speed of the bob as it first swings through its lowest level.

Energy Statement

(2)

Write an energy statement for this situation.

Data Collection

(4)

Make a clearly labeled table for organizing the raw and processed data that you expect you will collect.

Data Processing

(6)

Include an analysis of the data collected, including sample calculations of processing the data.

Questions

(2)

2. How much work is done on the bob by the tension in the string? Explain.

Station #3

Springs

Research Problem

Diagram

(2)

Include a labeled diagram.

- Push the spring toy down to the tabletop until it sticks. Wait until it springs into the air. Take any measurements needed to calculate the spring constant of the spring.

Energy Statement

(2)

Write an energy statement for this situation.

Data Collection

(4)

Make a clearly labeled table for organizing the raw and processed data that you expect you will collect.

Data Processing

(6)

Include an analysis of the data collected, including sample calculations of processing the data.

Questions

(2)

3. Calculate the speed of the spring toy upon leaving the table.

Station #4

Bow And No Arrow

Research Problem

Diagram

(2)

Include a labeled diagram.

- Pull back the bow string a distance of 5.0 cm. Take measurements necessary in order to determine how fast a 0.025 kg arrow would leave the bow if you were to shoot it from this position (without actually shooting anything!).

Energy Statement

(2)

Write an energy statement for this situation.

Data Collection

(4)

Make a clearly labeled table for organizing the raw and processed data that you expect you will collect.

Data Processing

(6)

Include an analysis of the data collected, including sample calculations of processing the data.

Questions

(9)

4. Derive an expression for the speed of the arrow in terms of k , x , and m .
5. Calculate how much energy is stored in the bow when it is stretched 5.0 centimeters.
6. Calculate the amount of work you did by pulling the bowstring back 5.0 centimeters.