



Physics Lab

Lab # _____

Name: _____ Date: _____ Period: _____

Potential Energy of a Golf Ball

Introduction: Gravitational Potential Energy is the stored up energy in an object due to its weight and height above the ground. As an object falls, the height decreases and so does the potential energy. However, the loss of potential energy is balanced by a gain in kinetic energy since the object increases in speed as it falls. Finally, when the object strikes the ground, it usually bounces back up into the air...but not as high as when it started. If the total amount of energy must be conserved, what happened to the rest of the energy? Some of it was converted to heat as the object struck the ground. Some became sound energy, while some was transferred into the ground causing vibrations.

Problem: How does the Gravitational Potential Energy of a golf ball change as it falls from a certain height and bounces on the floor?

Materials: Balance Golf ball Meter Stick Calculator

Procedure:

1. Determine the mass of a golf ball and record the results on the data table #1.
2. Calculate and record the Gravitational Potential Energy of the golf ball for heights of ***0.50 m***, ***1.00 m***, and ***1.50 m*** using the formula:

$$\text{PE} = mgh \quad (\text{mass} = \text{Kg} \quad g = 10 \text{ m/s}^2 \quad h = \text{meters} \quad \text{PE} = \text{Joules})$$

3. Drop the golf ball from the same height 5 times and record the rebound height after the ball hits the floor.
4. Calculate the change in height and potential energy.
5. Draw a graph of your results and use the graph to predict the rebound height for various heights above the floor as given in data table #2.
6. **Test** your predictions by actually dropping the golf ball from the given heights.
7. Plot your predicted results and your experimental results on the same graph.
8. Write an appropriate **conclusion** below based upon your data and observations:

Data Table #1

Mass of
golf ball = _____ Kg

Starting
height = 0.50 m

Starting
Potential
Energy = _____ J

Trial	Rebound Height (m)	Potential Energy (J)
1		
2		
3		
4		
5		
Avg.		

Mass of
golf ball = _____ Kg

Starting
height = 1.00 m

Starting
Potential
Energy = _____ J

Trial	Rebound Height (m)	Potential Energy (J)
1		
2		
3		
4		
5		
Avg.		

Mass of
golf ball = _____ Kg

Starting
height = 1.50 m

Starting
Potential
Energy = _____ J

Trial	Rebound Height (m)	Potential Energy (J)
1		
2		
3		
4		
5		
Avg.		

Prediction and Testing

Data Table #2

Height (m)	Predicted Rebound (m)	Actual Rebound (m)
<i>0.20</i>		
<i>0.80</i>		
<i>1.20</i>		
<i>1.60</i>		
<i>2.00</i>		

[illegible]