Name:_____ Period:____

Mechanical Energy Lab

Purpose:

- To use previous knowledge of velocity to perform kinetic energy calculations
- To make calculations of gravitational potential energy.
- To determine what affects GPE and KE more.

Part One: Potential Energy:

Potential Energy is the mechanical energy of position. In other words, potential energy is how much potential something has to do work. The formula used to measure P.E. is:

P.E. = Mass x G x Height

Object	Mass (g)	Mass (kg)	Location	Height (m)	P.E. (J)
Golf Ball			On Floor		
Golf Ball			On Desk		
Golf Ball			On Top of a Group Member's Head		
Marble			On Floor		
Marble			On Desk		
Marble			On Top of a Group Member's Head		
Tennis Ball			On Floor		
Tennis Ball			On Desk		
Tennis Ball			On Top of a Group Member's Head		

Part Two: Kinetic Energy

Kinetic Energy is the mechanical energy of motion. In other words, kinetic energy is how much work an object is currently doing. The formula for determining K.E. is:

K.E. = (1/2m) x (v^2)

You will simply drop the objects from Part One from a variety of locations. Fill in the data tables below to determine both the P.E. and K.E. for each situation.

Hint: Talk about what strategies would be helpful to collect an accurate measurement for *TIME* in this experiment.

MARBLE

Mass (kg)	Distance of Drop (m)	Time Trials (s) 1	2	3	Avg.	Velocity (m/s)	Potential Energy (J)	Kinetic Energy (J)

GOLF BALL

Mass (kg)	Distance of Drop (m)	Time Trials (s) 1	2	3	Avg.	Velocity (m/s)	Potential Energy (J)	Kinetic Energy (J)

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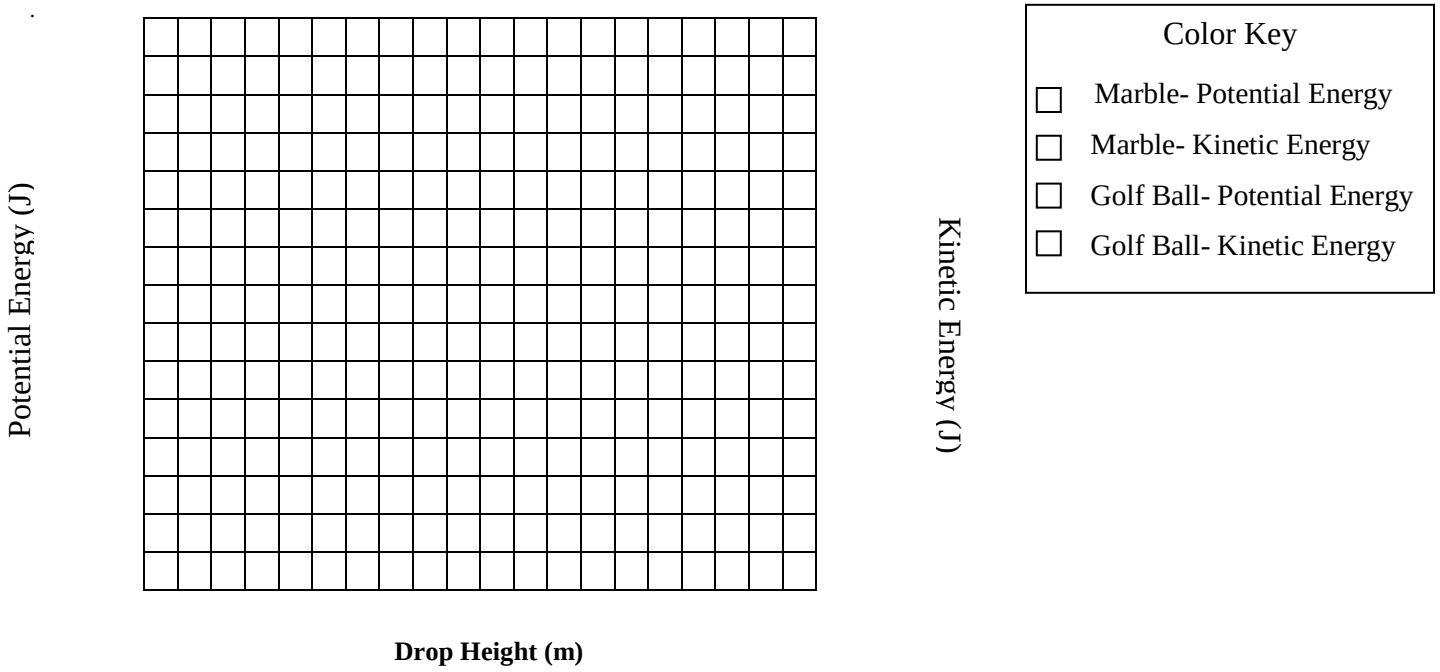
TENNIS BALL

Mass (kg)	Distance of Drop (m)	Time Trials (s) 1	2	3	Avg.	Velocity (m/s)	Potential Energy (J)	Kinetic Energy (J)

GRAPH

Construct a line graph for the marble and golf ball in the space provided. This graph should contain four lines with a color-coded key. Don't forget to label the x-axis and y-axis with an appropriate scale and give the graph a descriptive title.



ANALYSIS: Answer these questions on a separate sheet of paper and staple it to your lab sheet.

1. When was the potential energy the highest in this experiment and why?
2. When was the kinetic energy the highest in this experiment and why?
3. In theory, the potential energy at the top of the drop should match the kinetic energy at the bottom of the drop for each trial. Did all of the potential energy transfer to kinetic energy in your test? Does this mean you lost/gained any energy? Explain using the law of conservation of energy.
4. Was this experiment perfect? Explain some possible sources of error.
5. Which has a greater effect on the kinetic energy of an object…mass or velocity? Why?
6. Would the golf ball have more or less potential energy on the moon than it does on earth? Why?
7. Sketch a graph that shows how the energy transfers from potential to kinetic energy as a ball falls from the top of a building. Draw and label three lines (one for kinetic, one for potential, and one for total mechanical energy).