Lab 3 – Energy Lab

Introduction:

Write 10 sentences that talk about the topics in chapter 15. You can use your notes, the textbook, vocabulary, etc. to help you.

Materials: (copy the materials into the lab notebook)

Physics stand	Car	CPO timer	Scale
Ramp	2 Photogates	Ruler	

Procedure: (copy the procedure into the lab notebook)

1. Use the car and ramp set up card at your station to assemble the equipment.
2. Use the scale to record the mass of the car in kilograms. The scale will give you grams, so you will need to convert. The height at the bottom of the ramp will be assumed as 0 meters.
3. Measure the height of the car in centimeters when it is at the top of the ramp.
4. Use the ramp's scale to determine the distance between the two photogates. This will be the distance in the 2nd chart for all three trials.
5. Allow the car to go down the ramp 3 times and record the times.

Data: (You can tape the data charts ONLY in the lab notebook. All other sections must be hand written in BLACK INK.)

Mass of Car (kg)	Height of Car at the Top (m)	Height of Car at the Bottom (m)

**Data hints (You do not need to copy the hints into the lab notebook).

1. To convert g to kg, use King Henry.
2. To convert cm to m, use King Henry.

	Trial #1	Trial #2	Trial #3
Distance (m)			
Time (s)			
Speed (m/s)			
Average Speed (m/s)			

**Data hints (You do not need to copy the hints into the lab notebook).

1. To convert cm to m for distance, use King Henry.
2. The time to record is time AB.
3. To get the average speed, add the speeds for each trial and divide by 3.

Potential Energy (J)	
Top of the Ramp	Bottom of the Ramp

**Data hints (You do not need to copy the hints into the lab notebook).

1. To calculate potential energy, use PE = mgh. g =9.8 m/s^2

Kinetic Energy (J)	
Top of the Ramp	Bottom of the Ramp

**Data hints (You do not need to copy the hints into the lab notebook).

1. To calculate kinetic energy, use KE = $\frac{1}{2}mv^2$. Use the average speed in the calculation.
2. Assume the speed of the car at the top of the ramp is 0 m/s since the car has not started moving yet.

Questions: (Copy the questions and answer them in the lab notebook)

1. How did the amount of potential energy at the top of the ramp compare with the amount of kinetic energy at the bottom of the ramp?
2. According to the law of conservation of energy, the two numbers from question 1 should be equal. Why do you think that your numbers were not exactly equal?
3. A ball with a mass of 0.5 kg is rolling down a ramp. At the bottom of the ramp, it has 2500 J of kinetic energy. How fast was the ball rolling?
4. A book has 250 J of potential energy when it is on a shelf that is 4.2 m high. What is the mass of the book?

Conclusion:

Write 3 sentences for the conclusion. They can be about anything that you learned, mistakes that you made during the lab, or any real life connections that you can use to relate to the lab.