## Regents Physics Lab #25: Work-Energy Theorem

Objective:
To determine the average force delivered by a spring inside of a cart plunger.

Procedure:
1) Set your SparkVue to create a velocity vs. time graph.
2) Press the spring plunger into the cart, and measure the compression length (Δx) of the spring.
3) Press the release button on the top of the car, and record the velocity of the cart after the spring has been released.
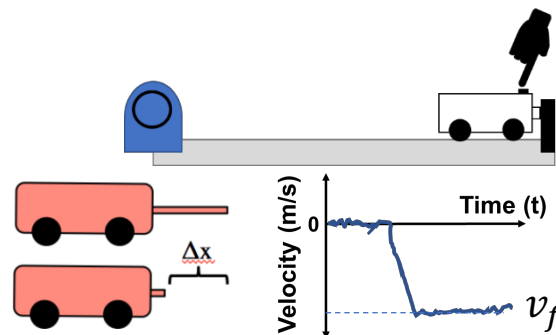
Data and Analysis:

1. Calculate the kinetic energy of the cart after each trial. What do you notice about the value of kinetic energy in each trial?

Trial	Cart Mass	Cart Final Velocity v_{fA} (m/s)	Cart Kinetic Energy KE (J)
1	0.50 kg	0.72	
2	0.75kg	0.57	
3	1.00 kg	0.5	
4	1.25 kg	0.45	
		Average KE	

$\Delta x = 0.04$ m

2. What is the source of the kinetic energy of the cart? What energy change has occurred? Explain

3. How much work is done on the cart by the spring? *Justify your response*, using concepts learned in class.

4. Calculate the average force applied on the cart by the spring. [*Show all work, including equation, substitution with units and answer with units.*]