Name: _____ Date: _____

Momentum – Inelastic Collision

<u>Objective</u>: To verify the law of conservation of momentum.

<u>Equipment</u>:
Carts   Masses   Metal rods
Stopwatch

<u>Procedure</u>:
1. To load the exploder on a cart, push the tube into the cart and lodge it behind the metal plate.
2. Repeat for a second cart and connect them (there may be Velcro to do so) so that the springs are opposite each other.
3. Set two metal rods parallel and apart from each other. The total distance of separation should be one meter plus the length of two carts.
4. Setup the carts halfway between the two rods. Note the distance FROM THE FRONT of the cart to each rod. Do NOT record these distances in the table yet. Strike the carts so they are released at the same time.
5. Listen for the sound of the carts hitting the rods. If they hit at the same time, RECORD the distances in the table. Also record the masses of the two carts.
6. If they do not hit at the same time, repeat step four and five until the sounds are simultaneous.
7. Repeat for five total trials, adjusting the masses in the carts. They need not (and should not) always be the same mass in each cart.

<u>Data</u>:

Trial	Cart 1 Mass (kg)	Distance 1 (m)	Cart 2 Mass (kg)	Distance 2 (m)	Time of Carts (s)
1					
2					
3					
4					
5					

<u>Analysis:</u>
Find the velocity for each cart in each trial.
Find the momentum for the carts in each trial. Create a table that displays your results.

<u>Conclusion:</u>
1. What is the total momentum of the carts before the explosion?
2. What should be the total momentum of the carts after the explosion?
3. Do your results (from the table) verify your answer to number two (and thus the objective)?
4. Do your distances (from the data) verify that mass is inversely proportional to mass in the momentum equation?
5. What is the significance of positive and negative signs when finding momentum?