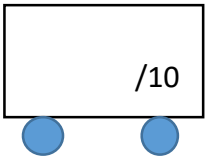

Name: _____

Momentum Informal Lab
The Cart and Brick Interactive

Background:
In this interactive, you will analyze a collision to determine the total momentum of a system before and after the collision. Your goal is the gather evidence that supports the law of conservation of momentum.

Before: A stationary brick and a moving cart. Collision: The stationary brick is dropped (ignore vertical motion of the brick) upon the moving cart. After: The cart and brick travel together.

A ticker tape is attached to the cart and pulled along with the cart through a ticker tape timer. Ticks (dots) are marked on the tape every $1/60^{th}$ of a second, leaving a trace of the cart's position over the course of time. Analysis of the ticker tape allows you to determine the velocity of the cart before and after the collision. A short tutorial on the analysis of ticker tapes can be accessed in the iFrame, click on "View a Sample Analysis". (Link on Blog.)

Purpose:
To analyze a collision and accumulate evidence that supports the law of conservation of momentum.

Procedure:
1. Go to the link on the class Blog at today's date and in the iFrame click on "Begin Activity". You can make the frame full screen by clicking the upper left corner of the iFrame.
2. You may look at any of the 18 collision options, but please choose two to analyze
    a. A "slow" collision, and
    b. A "fast" collision

Slow Collision

3. Observe the collision animation; repeat if necessary.
4. Record the masses in the data table.
5. Tap the **Analyze Data** button. Here the ticker tape is displayed with a centimetre ruler positioned below it. The collision point is indicated.
6. Measure the distance (convert to metres) and the time (in seconds) on the pre-collision side of the tape. Record the data on the pre-collision side of the data table. Note: The time is 0.10s total for 6 spaces (between 7 dots), or 60 spaces in 1 second, 60Hz.
7. Repeat procedure 6 for the post-collision side of the tape.
8. Calculate the velocities and momentums.

Fast Collision

9. Repeat Procedures 3 to 8 for the "fast" collision animation.

Data:

a. Slow Collision:

		Pre-Collision				Post-Collision			
	Mass (kg)	**Distance (m)**	**Time (s)**	**v (m/s)**	**p (kg*m/s)**	**Distance (m)**	**Time (s)**	**v (m/s)**	**p (kg*m/s)**
Cart									
Brick									
System									

b. Fast Collision:

		Before Collision				After Collision			
	Mass (kg)	**Distance (m)**	**Time (s)**	**v (m/s)**	**p (kg*m/s)**	**Distance (m)**	**Time (s)**	**v (m/s)**	**p (kg*m/s)**
Cart									
Brick									
System									

Conclusion:

Does the collision between the cart and the brick follow the law of conservation of momentum? Support your claim by describing the evidence and reasoning that supports it.