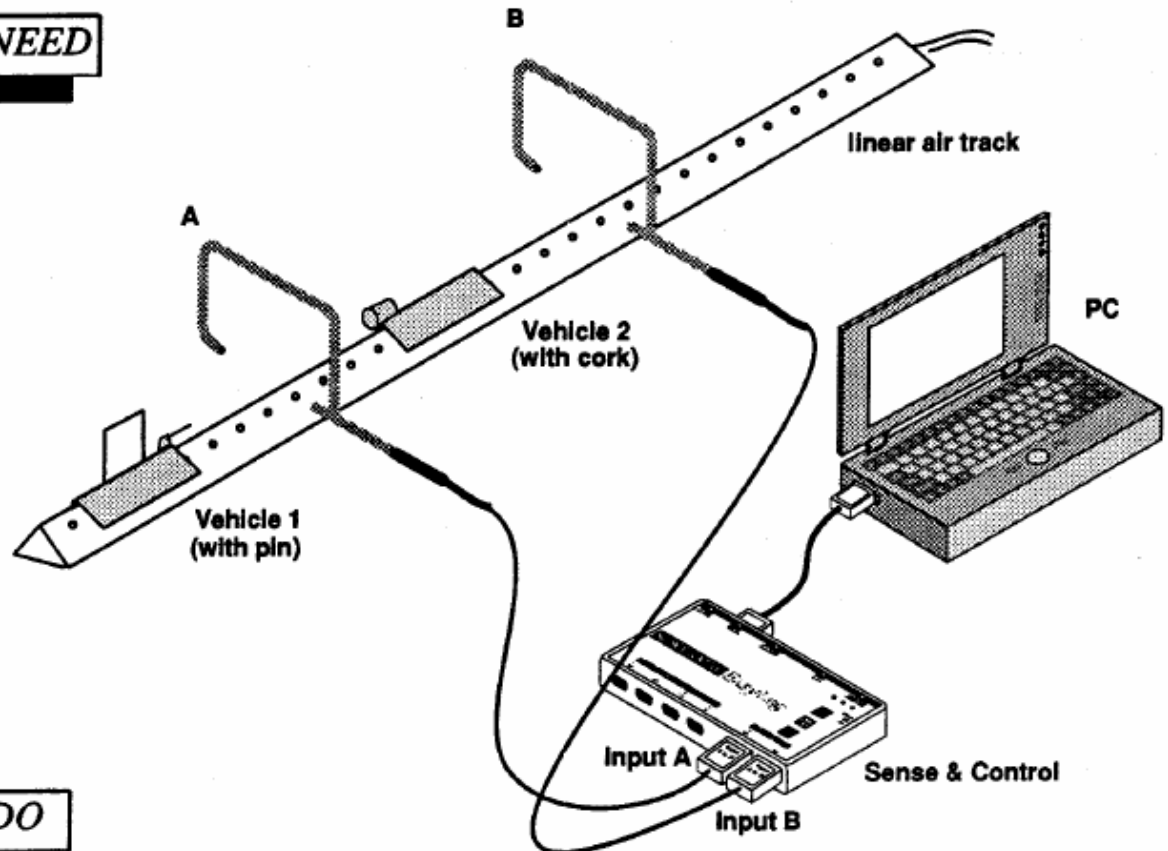


Inelastic Collisions.

READ

In this experiment you will discover how the velocities of two "vehicles" moving along a "frictionless" air track change when they collide "head on". After the collision the vehicles stick together and move off at a common speed. The velocities before and after collisions are found and you will analyse the results to investigate the momentum and kinetic energy before and after the collision.

WHAT YOU NEED



WHAT TO DO

1. Set-up the Apparatus as shown above and as directed in pre-lab
2. Click-on the *Data Studio* icon on the desktop and open the program
3. Click-on the *Create an Experiment* icon and add the photogates to the software as directed in pre-lab. Make the adjustments and bring-up the tables as also directed in pre-lab.

Procedure:

1. Mass Cart 1 and Cart 2 using the triple beam balance and place these values below.

Mass Cart 1 _____ Kg Mass Cart 2 _____ Kg

2. Mass a mass bar and place this value below

Mass of Mass Bar _____ Kg

- Place Cart #2 in-between the photogates
- Press START to run the program and gently push Cart #1 towards cart #2. The carts should stick together and move through photogate #2.
- Calculate the velocity by dividing the length of the index card running through the photogate by the elapsed time. Record these velocities in the table below.
- Calculate the Total Momentum BEFORE and Total Momentum AFTER the collision and place these values in the table. Show all work in the provided areas.
- Repeat the experiment varying the masses as shown below.

	Mass of Incoming Cart (Kg)	Mass of Target Cart (Kg)	Velocity of Incoming Cart (m/s) BEFORE Collision	Velocity of combined Mass (m/s) AFTER collision
Carts only				
Mass on cart 1				
Mass on cart 2				

Calculate the Momentum BEFORE and AFTER the Collision

Trial #1 Carts Only

Momentum BEFORE Collision

Momentum After Collision

Trial #2 Mass on Cart 1

Momentum BEFORE Collision

Momentum After Collision

Trial #3 Mass on Cart 2

Momentum BEFORE Collision

Momentum After Collision

Momentum Table

	Momentum Before	Momentum After
Trial 1		
Trial 2		
Trial 3		

Questions:

1. How do you your AFTER values compare to your BEFORE values? _____

2. What sources of error do you think account for the difference in values? _____

3. What modifications could you make to this experiment to possible achieve better results? _____
