

Name:

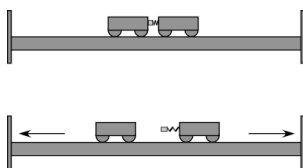
Period:

Conservation of Momentum (Collisions Lab)

The product of the mass of a moving object and its velocity is called its momentum. In this experiment you will study the momentum of two carts with unequal and equal masses. The carts will be placed together and will move apart when a compressed spring between them is released. You will find the velocity of each cart in order to compare the momentum before and after the carts move apart.

At Rest (Explosion)

Level your track and attach carts to each other Velcro side. Make sure correct weights are attached to the carts. The carts should meet at the 60 cm line on the track. Make sure the timer on your photogate is reset. Press spring release button with your pencil. Observe the motion of the carts and collect your data.



To solve for the final velocity of cart 2 use the $V = D/T$. The photogate should be set to interval.

Trial	Distance	Time	Final Velocity Cart 2
1	0.076 m		
2	0.076 m		

Trial	Cart 1 Mass	Cart 2 Mass	Initial Velocity Cart 1	Initial Velocity Cart 2	Final Velocity Cart 1	Final Velocity Cart 2
1	0.500 kg	0.750 kg	0 m/s	0 m/s		
2	0.750 kg	0.750 kg	0 m/s	0 m/s		

Use the conservation of momentum formulas to solve for the final velocity of cart 1. Show work below.

Use your data collected to solve for the momentum before and after the explosion.

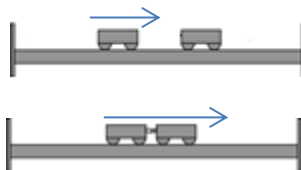
Trial	P Initial Cart 1	P Initial Cart 2	Total Initial P	P Final Cart 1	P Final Cart 2	Total Final P
1.						
2.						

Name:

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Inelastic Collision

In this experiment you will study the momentum of two carts with unequal masses. Cart 1 will have an initial velocity while Cart 2 will be at rest at the 60 cm mark. The two carts should stick to create a new mass. You will find the velocity of each cart in order to compare the momentum before and after the carts collide



Trial	Cart 1 Mass	Cart 2 Mass	Initial Velocity Cart 1	Initial Velocity Cart 2	Final Velocity Cart 1 + 2
2.	0.500 kg	0.750 kg		0 m/s	
3.	0.750 kg	0.750 kg		0 m/s	

To solve for the final velocity of (cart 1 + cart 2) use the $V = D/T$. The photogate should be set to interval.

Trial	Distance	Time	Final Velocity
1.	0.076 m		
2.	0.076 m		

Use you conservation of momentum formulas to solve for the final velocity of cart 1. Show work below.

Use your data collected to solve for the momentum before and after the explosion.

Trial	P Initial Cart 1	P Initial Cart 2	Total Initial P	P Final Cart 1 + 2	Total Final P Cart 1 + 2
1.					
2.					

Name:

Period:

At Rest (Explosion)

1. Compare the initial and final momentum. Is momentum conserved in this experiment? Support your answer with data from the experiment.
2. For each run of your inelastic collision experiment, calculate the percent difference between the initial momentum and the final momentum. Does your data indicate conservation of momentum?

P Initial	P Final	% Difference

2. What source of experimental error might have affected your results?

Inelastic Collision

1. Compare the initial and final momentum. Is momentum conserved in this experiment? Support your answer with data from the experiment.
2. For each run of your explosion experiment, calculate the percent difference between the initial momentum and the final momentum. Does your data indicate conservation of momentum?

P Initial	P Final	% Difference

2. What source of experimental error might have affected your results?