

Momentum and Impulse

Name: _____ T.A. _____

Partners: _____

Course Number: _____ Section Number: _____ Date: _____



1. Collisions (Please discuss with your group member.)

• Experiment 1

Hit one glider against a glider which has the equal mass.

Before collision	After collision?
	<p>Describe qualitatively the motions after the collision.</p>

• Experiment 2

Hit one glider against a glider which has a different mass.

Before collision	After collision?
	<p>Describe qualitatively the motions after the collision.</p>

Before collision	After collision?
	<p>Describe qualitatively the motions after the collision.</p>

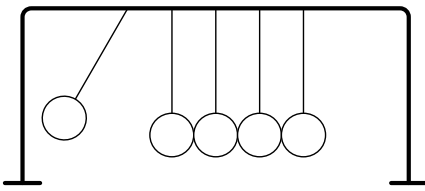
Question:

How different are above two collisions? Do you find any rule of collisions?

2. Conservation of Momentum

- **Experiment 1**

Try the following case.

Before collision	After collision?
	Sketch the picture after the collision.

Question:

Momentum is defined by $\text{mass} \times \text{velocity}$. In this experiment, you can recognize that the velocity depends on the height where you drop the suspended ball. Obtain the momenta of before and after collisions respectively. If each value of momentum is equal, you can say, "Momentum is conserved."

- **Experiment 2**

Try two more different cases, and verify that the momenta are conserved.

Before collision	After collision?
Sketch the picture before the collision.	Sketch the picture after the collision.

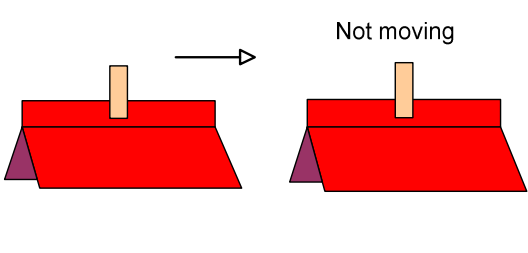
Before collision	After collision?
Sketch the picture before the collision.	Sketch the picture after the collision.

Question:

Are the momenta conserved?

3. Summary

Try this collision.

Before collision	After collision?
 <p>The diagram shows two red gliders on a purple air track. The left glider has a wooden peg and is moving to the right, as indicated by a black arrow. The right glider is stationary and labeled "Not moving".</p>	<p>Sketch the motion of gliders.</p>

Question:

Describe the above whole motion by using “momentum”, “conservation” and “transfer.”

Discussion:

Discuss the first part of experiment with the knowledge you obtained in the second and third parts.