

Collision Investigation: Part I

During this investigation, you will stage a head-on collision between two collisions cars of equal mass. Be very careful not to give your cars too much speed, or they will leave the track.

Begin by assigning each member of your group a role to perform during this lab. Make sure that you read the job descriptions below so that each member is clear as to what he/she is responsible for in this activity.

Group Member #1: Materials Specialist - This group member is responsible for obtaining and returning the collision materials. If your group does not return ALL of the checked out materials, ALL group members will lose points on this assignment.

Group Member #1: _____

Group Member #2: Recorder - This group member is responsible for recording the group's answers to this worksheet. This group member must listen to all group members and record the group's consensus.

Group Member #2: _____

Group Member #3: Collision Specialist (If you do not have a third group member, leave this question blank.) This group member is responsible for setting the cars in motion for the collision. If there is no third member, Group Members #1 & #2 will take turns in this role. This group member is responsible for making sure the cars stay on the track.

Group Member #3: _____

1. Do not add any mass to either car. Set one car at the middle of the track. Give the other car a small push so that it collides with the stationary car. Describe what happened in the collision.
2. Repeat the collision you just performed, but this time give the car a larger push so that it hits the target car with greater speed.
 - a. Describe what happened in the collision.
 - b. How did the collision change when you gave the launched car more speed?
 - c. Describe a real-life situation that this collision could represent.
3. Now, add two metal spheres to each car. Repeat the two collisions that you performed when the cars had no extra mass. Compare and contrast the collisions with large masses to those with small masses.

4. Remove the spheres from the target car (the stationary car). Give the launch car a small push so that it collides with the stationary car.
 - a. Describe what happened in this collision.

 - b. Test different speeds for the launch car. Describe whether different speeds affect the results.

 - c. Describe a real-life situation that this collision could represent.

5. Add two spheres to the target (stationary) car and remove the spheres from the launch car.
 - a. Describe what happened in this collision.

 - b. Test different speeds for the launch car. Describe whether different speeds affect the results.

6. You have made observations of what happens when a massive cart hits a less massive cart and vice versa. Suppose you conducted another experiment where you did not know the mass of the target car. Describe how you would know if it had less mass than, the same mass as, or more mass than the target car.

7. A small sports car collides with a much larger truck that is not moving. Describe what you would expect to happen based on your observations in this experiment.