

Name: _____ Date: _____

m_r^β **Physics Practice: Right angle collisions**

Car accidents often occur with the cars striking each other at nearly perpendicular angles. For this investigation, we will use <http://www.mrbenson.org/pde/carCrash/>.

To study these collisions, we will need to understand the idea of *headings*.

1. Suppose the red car has a mass of 1000kg, and is traveling 20 m/s. Suppose the blue car has a mass of 2000kg, and is moving 10 m/s.

a. Calculate the momentum and kinetic energy of each car before the collision.

b. Calculate the momentum and kinetic energy of the cars after the collision.

c. Is kinetic energy conserved?

d. Which car loses more kinetic energy?

2. Under what general conditions do the cars move away on a 45° heading? Why?

3. When objects are on paths that are 90° apart, is it possible for total momentum to be zero? Explain.

4. When objects collide, must both objects slow down? Explain.

5. When objects collide, can both objects speed up? Explain.
