Inelastic Collision Problems

Name: _____ Date: _____

1. A railway car of mass 6000kg is moving to the right at 2.0m/s when it collides with an empty freight train car of mass 3000kg rolling to the left on the same track at 3.0 m/s. Calculate the speed and direction of the pair (stuck together) after the collision. Compare the total kinetic energy before and after the collision. Is it conserved? Where did the energy go? [*check with the simulator*]

2. A car is chasing after another car. The car in pursuit has a mass of 1200kg and is moving at 20 m/s. It bumps into back of the other car which is moving at 10 m/s in the same direction. The bumpers get stuck together and the two cars move together with a common speed of 12 m/s. Calculate the mass of the second car. [*check with the simulator*]

Simple Elastic Collision Problems

1. Two carts are moving along an air track towards one-another. Cart 1 has a mass of 5.0 kg and is moving at 40 m/s to the right. Cart 2 has a mass of 1.0 kg and is moving at 10 m/s to the left. After the completely elastic collision Cart 2 is moving at 73.33 m/s to the right. Calculate the speed and direction of the first cart after the collision. [*check with the simulator*]

2. Two carts are moving along an air track towards one-another. Cart 1 has a mass of 2.0 kg and is moving at 100 m/s to the right. Cart 2 is moving at 50 m/s to the left. After the completely elastic collision Cart 2 is moving at 10.0 m/s to the right and Cart 1 is moving at 140.0 m/s to the left. Calculate the mass of Cart 2. [*check with the simulator*]