Name: Date: Period:

Momentum #3

1. In a NERF war, a foam dart with a mass of 0.13 kg is shot out of the gun at 3.5 m/s. If the gun has a mass of 1.8 kg, with what velocity does it recoil?

2. A soccer player applies a force of 270 N for 0.05 s. to a 0.434-kg ball initially at rest. What is its final velocity of the ball?

3. A small car with a mass of 800 kg is driving eastwith a velocity of 32 m/s, rear-ends a 1300 kg microbus also traveling east with a velocity of 10 m/s. If the small car has a final velocity of 18 m/s, what is the final velocity of the microbus?

4. **Challenge:** A truck with a mass of 5000 kg is traveling *north* with a velocity of 13 m/s. At an intersection, it collides with a car (m = 1500 kg) traveling *east* with a velocity of 20 m/s. What is the velocity of the vehicles after the collision? Assume they stick together after the crash.