Name: _____                                    Period: _____

### More Conservation of Momentum Problems

1. A 63 kg ice skater finishes her performance and crossed the finish line with a speed of 10.8 m/s. Suppose she accepts a huge 4.4 kg bouquet of flowers. How much does this slow her down?

2. A 15,000 kg railroad car moving at 7 m/s collides and sticks to a 2$^{nd}$ car of the with a mass of 17,000 kg that is moving in the same direction at 1.5 m/s. What is the velocity of the joined cars after the collision?

3. A dry cleaner throws a 22 kg bag of laundry onto a stationary 9 kg cart. The cart and laundry bag begin moving at 3 m/s. Determine the velocity with which the bag was thrown.

4. A 16 kg canoe traveling at 12 m/s makes a head-on collision with a 4 kg raft moving in the opposite direction at 6 m/s. After the collision the raft moves backwards at 22.7 m/s. Determine the velocity of the canoe after the collision.

Answers: 1:  0.71 m/s, 2:  4.1 m/s, 3:  4.2 m/s, 4:  4.8 m/s, 5:  0.04 m/s, 6:  0.042 m/s, 7:  2.4 m/s

5.   A tennis player places a 55 kg ball machine on a frictionless surface.  The machine fires a 0.057 kg tennis ball with a velocity of 36 m/s.  How fast does the machine roll backwards?

6.   A 0.012 kg toy car moving at 0.2 m/s has collision with a 0.02 kg toy car moving in the opposite direction at 0.3 m/s.  After the collision, the 0.012 kg car moves backwards with a velocity of 0.37 m/s.  Find the velocity of the 0.02 kg car after the collision.

7.   A 65 kg ice skater moving with a velocity of 2.5 m/s is holding a 0.15 kg snowball.  She throws the snowball forwards with a velocity of 32 m/s relative to the ground.  What is the velocity of the ice skater after throwing the snowball?