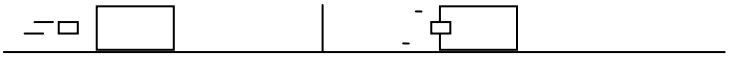
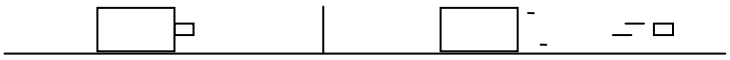
**Quizlette 6.2 - Conservation of Momentum** **Name**_____



1) A 6.10 g bullet going 830. m/s imbeds in a stationary 310. g block of wood. What is the velocity of the block of wood just after the collision? (16.0 m/s)

2) A 6.50 g bullet imbeds in a stationary 170. g block of wood. The bullet and block combo are going 21.0 m/s after the collision. What was the velocity of the bullet before the collision? (570. m/s)



3) A person at rest fires a 1.70 g rifle bullet to the right at 1320. m/s. The person recoils at 0.0290 m/s to the left after this. What must be the mass of the person? (77.4 kg)

4) A 52.0 kg person at rest fires a 1.80 g rifle bullet to the right. The person recoils at 0.0720 m/s to the left after this. What must be the velocity of the bullet? (2080 m/s)

5) A 61.0 kg person fires a 5.40 g rifle shell at 870. m/s. If the person is initially at rest on a frictionless surface, what is their recoil velocity after firing? (0.0770 m/s)

6) A 3500 kg car going 23.0 m/s strikes a 1400 kg car traveling in the same direction at 13.0 m/s from behind. The two cars stick together. What velocity are they going after the collision? (20.1 m/s)

7) A 3800 kg car (going an unknown velocity) strikes a 1100 kg car traveling in the same direction at 17.0 m/s from behind. The two cars stick together and have a velocity of 23.0 m/s. What velocity was the first car going before the collision? (24.7 m/s)

8) A 1200 kg car going 24.0 m/s strikes a 2600 kg car traveling in the same direction from behind. The two cars stick together and are going 19.0 m/s just after the collision. What velocity did the other car have before the collision? (16.7 m/s)

Don't forget to do the EXCITING second side!!!

## Draw your own picture!

9) Two football players strike each other head on. Player 1 has a mass of 120. kg and is running 3.30 m/s to the East, and player 2 has a mass of 95.0 kg is running 6.20 m/s to the West. What is their post-collision velocity if they stick together? (Speed and direction)
(0.898 m/s west)

10) Two football players strike each other head on. Player 1 has a mass of 110. kg and is running 3.50 m/s to the East, and player 2 has a mass of 85.0 kg is running to the West. If they stick together, and are together moving 1.90 m/s to the **West** after the collision, was the velocity of player 2 before the collision? (Speed and direction) (8.89 m/s west)

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11) Bumper car A (340. Kg) with velocity 4.50 m/s East collides with the rear of car B (610. Kg) which has a velocity of 2.40 m/s East. After the collision, car A has a velocity of 1.40 m/s to the West. What is the velocity of car B after the collision? (Speed and direction) (5.69 m/s east)

12) Bumper car A (480. Kg) with velocity 3.90 m/s East collides with the front of car B (410. Kg) which has a velocity of 5.10 m/s West. After the collision, car B has a velocity of 1.50 m/s to the East. What is the velocity of car A after the collision? (Speed and direction) (1.74 m/s west)

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13) 85.0 kg Thor is standing on a 35.0 kg cart, and is holding a 6.40 kg hammer. Everything is moving to the right at 3.40 m/s. What is the velocity of Thor and cart if he throws the hammer 25.0 m/s to the left? (Speed and direction) (4.91 m/s right)

14) 82.0 kg Thor is standing on a 25.0 kg cart, and is holding a 6.20 kg hammer. Everything is moving to the right at 2.40 m/s. What is the velocity of Thor and cart if he throws the hammer 18.0 m/s to the left? (3.58 m/s right)

15) 88.0 kg Thor is standing on a 42.0 kg cart, and is holding a 8.40 kg hammer. Everything is moving to the right at 4.30 m/s. After he throws the hammer, he and the cart are moving 6.60 m/s to the right. What speed and in what direction did he throw the hammer? (31.3 m/s left)