

3. A railroad car of mass 2.00×10^4 kg moving at 3.00 m/s collides and couples with two coupled railroad cars, each of the same mass as the single car and moving in the same direction at 1.20 m/s. (a) What is the speed of the three coupled cars after the collision? (b) How much kinetic energy is lost in the collision?

4. A 2.35 kg ball moving at 4.20 m/s to the right hits a 3.45 kg ball head-on that is traveling at 3.50 m/s to the left. The second ball ends up going to the right with a velocity of 2.50 m/s. What is the velocity of the first ball after the collision?

5. A 10.5 g bullet is fired into a 8.50 kg wooden block that is hanging straight down, suspended by a 1.50 m length of light line. The bullet stays in the block. The block swings outward, so that the line it hangs from makes an angle of 7.00° to the vertical. (a) What is the velocity of the bullet before it strikes the block? (b) What is the loss of energy in the collision?

