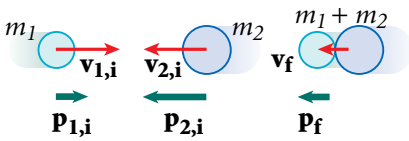
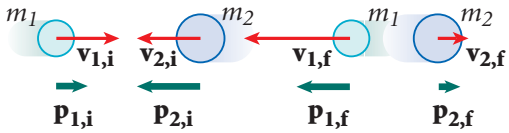
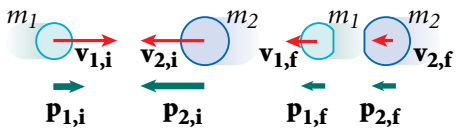
Table 2 Types of Collisions

Type of collision	Diagram	What happens	Conserved quantity
perfectly inelastic		The two objects stick together after the collision so that their final velocities are the same.	momentum
elastic		The two objects bounce after the collision so that they move separately.	momentum kinetic energy
inelastic		The two objects deform during the collision so that the total kinetic energy decreases, but the objects move separately after the collision.	momentum

SECTION REVIEW

1. Give two examples of elastic collisions and two examples of perfectly inelastic collisions.
2. A 95.0 kg fullback moving south with a speed of 5.0 m/s has a perfectly inelastic collision with a 90.0 kg opponent running north at 3.0 m/s.
   a. Calculate the velocity of the players just after the tackle.
   b. Calculate the decrease in total kinetic energy as a result of the collision.
3. Two 0.40 kg soccer balls collide elastically in a head-on collision. The first ball starts at rest, and the second ball has a speed of 3.5 m/s. After the collision, the second ball is at rest.
   a. What is the final speed of the first ball?
   b. What is the kinetic energy of the first ball before the collision?
   c. What is the kinetic energy of the second ball after the collision?
4. **Critical Thinking** If two automobiles collide, they usually do not stick together. Does this mean the collision is elastic?
5. **Critical Thinking** A rubber ball collides elastically with the sidewalk.
   a. Does each object have the same kinetic energy after the collision as it had before the collision? Explain.
   b. Does each object have the same momentum after the collision as it had before the collision? Explain.