

### Kinetic Energy in Perfectly Inelastic Collisions

- 1.** A 0.25 kg arrow with a velocity of 12 m/s to the west strikes and pierces the center of a 6.8 kg target.
  - a.** What is the final velocity of the combined mass?
  - b.** What is the decrease in kinetic energy during the collision?
  
- 2.** During practice, a student kicks a 0.40 kg soccer ball with a velocity of 8.5 m/s to the south into a 0.15 kg bucket lying on its side. The bucket travels with the ball after the collision.
  - a.** What is the final velocity of the combined mass?
  - b.** What is the decrease in kinetic energy during the collision?
  
- 3.** A 56 kg ice skater traveling at 4.0 m/s to the north meets and joins hands with a 65 kg skater traveling at 12.0 m/s in the opposite direction. Without rotating, the two skaters continue skating together with joined hands.
  - a.** What is the final velocity of the two skaters?
  - b.** What is the decrease in kinetic energy during the collision?