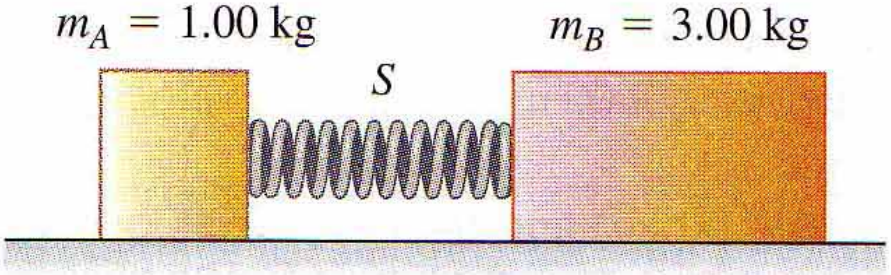
8. • Two figure skaters, one weighing 625 N and the other 725 N, push off against each other on frictionless ice. (a) If the heavier skater travels at 1.50 m/s, how fast will the lighter one travel? (b) How much kinetic energy is "created" during the skaters' maneuver, and where does this energy come from?

11. • **Baseball.** A regulation 145 g baseball can be hit at speeds of 100 mph. If a line drive is hit essentially horizontally at this speed and is caught by a 65 kg player who has leapt directly upward into the air, what horizontal speed (in cm/s) does he acquire by catching the ball?

14. •• Block A in Figure 8.36 has mass 1.00 kg, and block B has mass 3.00 kg. The blocks are forced together, compressing a spring S between them; then the system is released from rest on a level, frictionless surface. The spring, which has negligible mass, is not fastened to either block and drops to the surface after it has expanded. Block B acquires a speed of 1.20 m/s. (a) What is the final speed of block A? (b) How much potential energy was stored in the compressed spring?



▲ **FIGURE 8.36** Problem 14.

17. •• A 4.25 g bullet traveling horizontally with a velocity of magnitude 375 m/s is fired into a wooden block with mass 1.12 kg, initially at rest on a level frictionless surface. The bullet passes *through* the block and emerges with its speed reduced to 122 m/s. How fast is the block moving just after the bullet emerges from it?