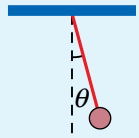
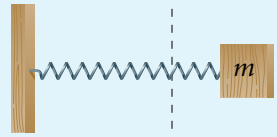
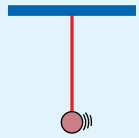
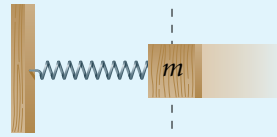
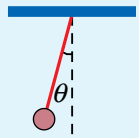
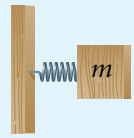
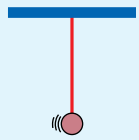
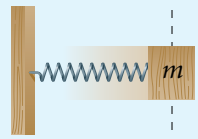
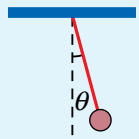
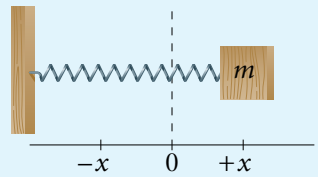
Table 1 Simple Harmonic Motion

maximum displacement			$F_x = F_{max}$ ← $a = a_{max}$ ← $v = 0$
equilibrium			$F_x = 0$ $a = 0$ $v = v_{max}$ ←
maximum displacement			$F_x = F_{max}$ → $a = a_{max}$ → $v = 0$
equilibrium			$F_x = 0$ $a = 0$ $v = v_{max}$ →
maximum displacement			$F_x = F_{max}$ ← $a = a_{max}$ ← $v = 0$

SECTION REVIEW

1. Which of these periodic motions are simple harmonic?
   - **a.** a child swinging on a playground swing ($\theta = 45°$)
   - **b.** a CD rotating in a player
   - **c.** an oscillating clock pendulum ($\theta = 10°$)
2. A pinball machine uses a spring that is compressed 4.0 cm to launch a ball. If the spring constant is 13 N/m, what is the force on the ball at the moment the spring is released?
3. How does the restoring force acting on a pendulum bob change as the bob swings toward the equilibrium position? How do the bob's acceleration (along the direction of motion) and velocity change?
4. **Critical Thinking** When an acrobat reaches the equilibrium position, the net force acting along the direction of motion is zero. Why does the acrobat swing past the equilibrium position?