

Assessment

Forces and the Laws of Motion**Section Quiz: Newton's Second and Third Laws**

Write the letter of the correct answer in the space provided.

- _____ 1. The change in the horizontal velocity of a 12-kg scooter is $+0.5$ m/s. What is the net horizontal force acting on it?
- $+24$ N
 - $+6.0$ N
 - greater than 0 N
 - 0 N
- _____ 2. A student holds a 6-N block of wood from a spring balance in an express elevator that maintains constant velocity traveling between floors. A spring scale reading of 5.9 N indicates that the elevator is
- starting an ascending trip.
 - ending an ascending trip.
 - ending a descending trip.
 - traveling between floors.
- _____ 3. During a three-part circus stunt, a clown holds a ball. The clown then tosses the ball upward. After releasing it, the ball is caught a few moments later from above by another clown on a trapeze. Which set of data could represent the normal force exerted by the ground on the first clown during the stunt? The force due to gravity on the clown is 680 N and that on the ball is 20 N.
- 700 N, 695 N, 720 N
 - 700 N, 695 N, 700 N
 - 700 N, 705 N, 700 N
 - 700 N, 705 N, 680 N
- _____ 4. In which situation is the net force acting on a car zero?
- The car increases speed and changes direction.
 - The car increases speed but does not change direction.
 - The car maintains its speed but changes direction.
 - The car maintains both its speed and direction.
- _____ 5. A truck and a car uniformly accelerate from rest to a velocity of 3.0 m/s in equal time intervals. The truck is ten times as massive as the car. Which of the following statements is correct?
- The acceleration of the truck is $1/10$ that of the car.
 - The truck travels $1/10$ the distance of the car.
 - The force on the truck is 10 times the force on the car.
 - all of the above

Forces and the Laws of Motion *continued*

- _____ **6.** In an action-reaction pair, the
- a.** action force is exerted first.
 - b.** action force and the reaction force are equal in magnitude and act in the same direction.
 - c.** action force and the reaction force are contact forces only.
 - d.** action force and the reaction force act on two different objects.
- _____ **7.** A batter strikes a baseball with a bat. Identify an action-reaction pair and describe the forces exerted by each.
- a.** The batter exerts a force on the bat; the ball exerts a force on the bat.
 - b.** The batter exerts a force on the bat; the bat exerts a force on the batter.
 - c.** The bat exerts a force on the batter; the bat exerts a force on the ball.
 - d.** The ball exerts a force on the bat; the bat exerts a force on the batter.
- _____ **8.** In interactions of action-reaction pairs involving Earth and everyday objects, the effect on Earth's motion is often negligible because
- a.** field forces do not obey Newton's third law.
 - b.** Earth has great inertia.
 - c.** everyday objects cannot exert forces on Earth.
 - d.** all of the above

- 9.** Explain how action-reaction pairs keep a book sitting on a table in equilibrium.

- 10.** A child tugs on a rope attached to a 0.62-kg toy with a horizontal force of 16.3 N. A puppy pulls the toy in the opposite direction with a force 15.8 N. What is the acceleration of the toy?