Name: _____ Class: _____ Date: _____

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?
   a. +24 N
   b. +6.0 N
   c. greater than 0 N
   d. 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
   a. starting an ascending trip.
   b. ending an ascending trip.
   c. ending a descending trip.
   d. 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.
   a. 700 N, 695 N, 720 N
   b. 700 N, 695 N, 700 N
   c. 700 N, 705 N, 700 N
   d. 700 N, 705 N, 680 N

_____ 4. In which situation is the net force acting on a car zero?
   a. The car increases speed and changes direction.
   b. The car increases speed but does not change direction.
   c. The car maintains its speed but changes direction.
   d. 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?
   a. The acceleration of the truck is 1/10 that of the car.
   b. The truck travels 1/10 the distance of the car.
   c. The force on the truck is 10 times the force on the car.
   d. all of the above

_____ 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.

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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?