Study Jams Questions

1. Every time your cat’s paw hits her toy string, it swings away from her. How does this demonstrate Newton’s third law of motion?

a. Objects with mass, such as your cat’s paw and toy string, will require inertia.

b. Objects in motion, such as the toy string, will experience force.

c. For every motion from your cat’s paw, there is unbalanced inertia from the string.

d. For every action your cat makes, there is equal and opposite reaction from the string.

2. What happens when two objects such as a baseball and bat collide?

a. One remains still while the other one moves in the same direction.

b. They hit each other with the same force in opposite direction.

c. They hit each other with unequal force in opposite directions.

d. They hit each other with the same force in the same direction.

3. What does an object do when it accelerates?

a. It speeds up.

b. It moves in the opposite direction.

c. It changes speed and direction.

d. All of the above.

4. What determines an object’s mass?

a. Weight and size

b. Inertia and friction

c. Weight and force

d. Size and force

5. When two objects with unequal mass collide, what will they do?

a. accelerate at different rates

b. Accelerate in the same direction

c. Come to a complete stop

d. Continue at the same velocity

6. A softball and a volleyball collide with equal speed, then they accelerate at the same rate. What must be true about the masses of the objects?

a. The softball has more mass than the volleyball

b. The softball and the volleyball have equal mass.

c. The volleyball has more mass than the softball.

d. It is impossible to compare the mass of the softball and the volleyball.

7. During PE your soccer ball collides with the goalie. What happens to the soccer ball?

a. It stops moving completely.

b. It accelerates at the same rate and in the same direction as the goalie.

c. It accelerates more and in a different direction than the goalie.

d. It continues moving at the same velocity as before.

Reading Guide Chapter 12.3 (pgs.372-375)

1. Where is a place that you can see Newton's laws in action? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. The bumper cars in figure 15 illustrate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Newton’s third law of motion.

3. A force cannot exist alone. Forces always exist in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

4. State Newton's Third Law of Motion \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5. When you are in a bumper car and bump into another bumper car, the force your car exerts on the other car is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The force the other car exerts on your car is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

6. The two forces mentioned in number 5 are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in size and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in direction.

7. Identify the action force in figure 16.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Identify the reaction force in figure 16. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. True or False: All action and reaction forces produce motion.\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Give one example of an action-reaction force pair that does not result in motion.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. When do action and reaction forces result in a net force of zero? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. If a marble and a loaded shopping cart are both slowly rolling toward you at the same speed, which one is easier to stop? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the product of an object's mass and its velocity.

14. The momentum for any object at rest is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

15. Write the formula for momentum \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16. What are the units for momentum? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17. What is the momentum of an object that has a mass of 10 kg and is moving at a speed 4 m/s? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. Which has more momentum, a 1.5 kg baseball moving at a speed of 45 m/s, or a 9.7 kg bowling moving at a speed of 8 m/s? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_