Name _____ Date _____ Class _____

Key Concept Builder

LESSON 4

Newton's Third Law

Key Concept What is the law of conservation of momentum?

Momentum Equation

momentum (in kg·m/s) = mass (in kg) × velocity (in m/s)

$$p = m \times v$$

Directions: *Answer each question or respond to each statement on the lines provided.*

1. Use the equation above to calculate the momentum of a 0.145-kg baseball being thrown at a speed of 40 m/s.

_____

2. Would an oil ship moving at a speed of 10 km/h have more or less momentum than a car moving at a speed of 100 km/h? Explain your answer.

_____

_____

3. **Consider** two kinds of collisions—between two billiard balls on a pool table and between two football players, one of them tackling the other. Which collision is elastic, and which one is inelastic? Explain your answer.

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4. When moving objects collide, their total momentum is conserved unless an outside force acts on them. What outside force brings most colliding objects, such as billiard balls, to a stop?

_____

Name _____ Date _____ Class _____

Content Practice A

LESSON 4

Newton's Third Law

Directions: *On the line before each statement, write* T *if the statement is true or* F *if the statement is false.*

_____ **1.** Newton's third law of motion states that when an object exerts a force on another object, the second object exerts an equal force in the same direction.

_____ **2.** The forces that two objects exert on each other are called a force pair.

_____ **3.** Forces in a force pair never cancel each other.

_____ **4.** The force that a hammer exerts on a nail is the reaction force.

_____ **5.** If an object experiences a net unbalanced force, the object accelerates.

_____ **6.** In the equation $p = m \times v$, the letter p stands for momentum.

_____ **7.** A bullet has more momentum than a moving ship.

_____ **8.** In collisions, momentum is seldom conserved unless an outside force acts on the colliding objects.

_____ **9.** A collision between two billiard balls is an elastic collision.

_____ **10.** A force that causes objects to gain momentum is friction.