

## Momentum Quiz Answer Key PDF

Momentum Quiz Answer Key PDF

*Disclaimer: The momentum quiz answer key pdf was generated with the help of StudyBlaze AI. Please be aware that AI can make mistakes. Please consult your teacher if you're unsure about your solution or think there might have been a mistake. Or reach out directly to the StudyBlaze team at [max@studyblaze.io](mailto:max@studyblaze.io).*

**Explain why momentum is considered a vector quantity and how this affects calculations.**

Momentum is considered a vector quantity because it is defined as the product of an object's mass and its velocity, where velocity is a vector that includes both speed and direction. This means that when calculating momentum, one must account for the direction of motion, which can lead to different results when combining momenta from multiple objects.

**Discuss how momentum is transferred in a game of pool when one ball strikes another.**

When the cue ball strikes another ball, it transfers its momentum to the target ball, causing the target ball to move while the cue ball slows down.

**Describe the difference between elastic and inelastic collisions with examples.**

In elastic collisions, both momentum and kinetic energy are conserved, such as in the collision of two billiard balls. In contrast, inelastic collisions conserve momentum but not kinetic energy, as seen in a car crash where the vehicles crumple and generate heat.

**Which statements about impulse are correct? (Select all that apply)**

- A. It is equal to the change in momentum ✓
- B. It is measured in Newton-seconds ✓
- C. It is a scalar quantity
- D. It can be calculated as Force x Time ✓

**How does the impulse-momentum theorem apply to safety features in vehicles?**

The impulse-momentum theorem applies to vehicle safety features by demonstrating that increasing the time over which a collision occurs (through crumple zones and airbags) reduces the force on occupants, thereby enhancing their safety.

Explain the principle of conservation of momentum and provide a real-world example.

The principle of conservation of momentum states that the total momentum of a closed system remains constant if no external forces act on it. A real-world example is a collision between two cars; the total momentum before the collision equals the total momentum after the collision.

In which type of collision is both momentum and kinetic energy conserved?

- A. Elastic Collision ✓
- B. Inelastic Collision
- C. Perfectly Inelastic Collision
- D. Partially Elastic Collision

What happens to the total momentum of a system if no external forces act on it?

- A. It increases
- B. It decreases
- C. It remains constant ✓
- D. It becomes zero

Which scientist is most associated with the laws of motion and momentum?

- A. Albert Einstein
- B. Isaac Newton ✓
- C. Galileo Galilei
- D. Niels Bohr

Which of the following best describes momentum?

- A. A scalar quantity
- B. A vector quantity ✓
- C. A constant quantity
- D. A dimensionless quantity

**What is the primary principle behind airbags in vehicles?**

- A. Conservation of Energy
- B. Conservation of Momentum
- C. Impulse-Momentum Theorem ✓**
- D. Newton's First Law

**Calculate the momentum of a 5 kg object moving at a velocity of 10 m/s.**

**The momentum is 50 kg·m/s.**

**Which of the following are true about momentum? (Select all that apply)**

- A. It is a scalar quantity
- B. It depends on both mass and velocity ✓**
- C. It can be transferred between objects ✓**
- D. It is always conserved in isolated systems ✓**

**In which situations is impulse applied? (Select all that apply)**

- A. A tennis racket hitting a ball ✓**
- B. A book resting on a table
- C. A hammer driving a nail ✓**
- D. A person standing still

**What is the unit of momentum in the International System of Units (SI)?**

- A. Newton
- B. Joule
- C. Kilogram meter per second ✓**
- D. Meter per second squared

**What is the formula for momentum?**

- A. Force x Time
- B. Mass x Velocity ✓**
- C. Mass x Acceleration

D. Velocity x Time

**Which of the following are characteristics of elastic collisions? (Select all that apply)**

- A. Total kinetic energy is conserved ✓**
- B. Objects stick together
- C. Momentum is conserved ✓**
- D. Objects bounce off each other ✓**

**Which factors affect the momentum of an object? (Select all that apply)**

- A. Mass ✓**
- B. Velocity ✓**
- C. Temperature
- D. Shape

**Which scenarios demonstrate the conservation of momentum? (Select all that apply)**

- A. A car accelerating on a highway
- B. Two ice skaters pushing off each other ✓**
- C. A ball thrown upwards
- D. A bullet being fired from a gun ✓**

**In a perfectly inelastic collision, what happens to the colliding objects?**

- A. They bounce off each other
- B. They stick together ✓**
- C. They explode
- D. They stop moving