2d collisions gizmo answers key

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2D Collisions Gizmo Answers Key

The 2D Collisions Gizmo is a virtual laboratory that allows students to explore the principles of elastic and inelastic collisions in two dimensions. By manipulating variables such as mass, velocity, and the coefficient of restitution, students can observe the effects of these parameters on the outcome of collisions.

Question 1: What is the coefficient of restitution?

Answer: The coefficient of restitution is a measure of the elasticity of a collision. It is defined as the ratio of the relative velocity of the objects after the collision to the relative velocity before the collision. A coefficient of restitution of 1 indicates a perfectly elastic collision, while a coefficient of restitution of 0 indicates a perfectly inelastic collision.

Question 2: How does the mass of an object affect the outcome of a collision?

Answer: The mass of an object affects the outcome of a collision in two ways. First, the heavier an object is, the more momentum it has. This means that a heavier object will have a greater impact on a lighter object in a collision. Second, the mass of an object affects its velocity. A heavier object will have a lower velocity than a lighter object with the same momentum. This is because momentum is equal to mass times velocity.

Question 3: How does the velocity of an object affect the outcome of a collision?

Answer: The velocity of an object affects the outcome of a collision in three ways. First, the faster an object is moving, the more kinetic energy it has. This means that a faster object will have a greater impact on a slower object in a collision. Second,

the velocity of an object affects its momentum. A faster object will have a greater momentum than a slower object with the same mass. Third, the velocity of an object affects the angle at which it collides with another object. This can affect the direction of the objects after the collision.

Question 4: What is the difference between an elastic and an inelastic collision?

Answer: An elastic collision is a collision in which the total kinetic energy of the objects is conserved. This means that the objects bounce off of each other without losing any energy. An inelastic collision is a collision in which the total kinetic energy of the objects is not conserved. This means that the objects lose some energy during the collision.

Question 5: How can the 2D Collisions Gizmo be used to study collisions?

Answer: The 2D Collisions Gizmo can be used to study collisions by allowing students to manipulate the variables that affect the outcome of collisions. By observing the results of different collisions, students can learn about the principles of momentum, energy, and elasticity.

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