

Name: _____ Date: _____

Student Exploration: 2D Collisions

Vocabulary: center of mass, conservation of energy, conservation of momentum, elasticity, kinetic energy, momentum, speed, vector, velocity

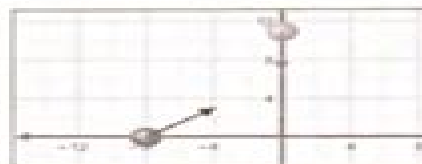
Prior Knowledge Questions (Do these BEFORE using the Gizmo.)



1. A pool cue hits the white cue ball, which travels across the table and strikes the red ball, as shown at right. Draw a solid line to show the path you would expect the red ball to take.
2. Draw a dashed line to show how you think the white ball will move after it has struck the red ball.

Gizmo Warm-up

Objects collide all the time, but often with very different results. Sometimes colliding objects will stick together. Other times, they will bounce off each other at an angle. What determines how objects will behave in a collision? You can use the 2D Collisions Gizmo to find out.



Note the arrows, or **vectors**, on each puck. Click **Play** (▶).

1. How does the direction and length of its vector relate to the motion of a puck? The length points to speed and the direction relates to the direction of momentum.
2. The **velocity** (speed and direction) of each puck is described by components in the **i** and **j** directions. The symbol for velocity is **v**. (Vector quantities are shown in bold.)
 - A. Which component represents movement in the east-west direction? \hat{i} is east - \hat{j} is west
 - B. Which component represents movement in the north-south direction? \hat{j} is North - \hat{i} is South
3. The **speed** (v) of a puck is equal to the length of its velocity vector. To calculate the speed of a puck with a velocity of $a\hat{i} + b\hat{j}$, use the *Pythagorean theorem*: $v = \sqrt{a^2 + b^2}$
 Set the velocity of the blue puck to $12.00\hat{i} + 5.00\hat{j}$ m/s. What is its speed? $v = 13.0 \text{ m/s}$



2d Collisions Gizmo Answers Key

Jessica J Manson

A red circular graphic with a gradient, appearing as a semi-circle or a partial circle, located to the right of the author's name.

2d Collisions Gizmo Answers Key:

The Enigmatic Realm of **2d Collisions Gizmo Answers Key**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing short of extraordinary. Within the captivating pages of **2d Collisions Gizmo Answers Key** a literary masterpiece penned with a renowned author, readers attempt a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting affect the hearts and minds of people who partake in its reading experience.

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2d Collisions Gizmo Answers Key Introduction

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