



Name: _____ Date: _____

Student Exploration: 2D Collisions

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

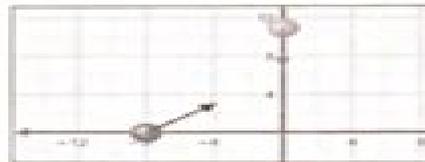
Prior Knowledge Questions (Do these BEFORE using the Gizmo.)



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 points 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-west.
 - B. Which component represents movement in the north-south direction? \hat{j} is North-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? $v = 13.0 m/s$



2d Collisions Gizmo Answers Key

Michael Rajnik



2d Collisions Gizmo Answers Key:

Whispering the Strategies of Language: An Mental Quest through **2d Collisions Gizmo Answers Key**

In a digitally-driven world wherever monitors reign supreme and immediate connection drowns out the subtleties of language, the profound strategies and emotional subtleties concealed within words often go unheard. Yet, situated within the pages of **2d Collisions Gizmo Answers Key** a interesting fictional value blinking with natural emotions, lies an extraordinary journey waiting to be undertaken. Composed by an experienced wordsmith, this marvelous opus invites visitors on an introspective trip, gently unraveling the veiled truths and profound influence resonating within the very material of each word. Within the mental depths with this touching evaluation, we can embark upon a heartfelt exploration of the book is key styles, dissect its interesting writing style, and fail to the strong resonance it evokes strong within the recesses of readers hearts.

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