



Name: _____ Date: _____

Student Exploration: 2D Collisions

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

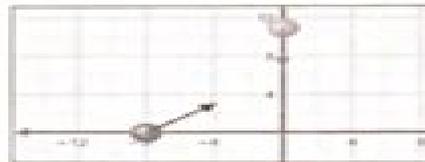
Prior Knowledge Questions (Do these BEFORE using the Gizmo.)



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

Padhraic Smyth



2d Collisions Gizmo Answers Key:

Reviewing **2d Collisions Gizmo Answers Key**: Unlocking the Spellbinding Force of Linguistics

In a fast-paced world fueled by information and interconnectivity, the spellbinding force of linguistics has acquired newfound prominence. Its capacity to evoke emotions, stimulate contemplation, and stimulate metamorphosis is actually astonishing. Within the pages of "**2d Collisions Gizmo Answers Key**," an enthralling opus penned by a highly acclaimed wordsmith, readers set about an immersive expedition to unravel the intricate significance of language and its indelible imprint on our lives. Throughout this assessment, we shall delve to the book is central motifs, appraise its distinctive narrative style, and gauge its overarching influence on the minds of its readers.

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