



## Curiosity Guide #601

### Collisions

Accompanies Curious Crew, Season 6, Episode 1 (#601)

#### Billiard Ball Bash

Investigation #5

#### Description

Is anyone up for a game of pool? Find out how billiards balls work together!

#### Materials

- 2 meter sticks
- 3 billiard balls
- Tape

#### Procedure

- 1) Place the meter sticks on the table parallel to one another to create a track for the balls to roll in.
- 2) Add a bit of tape to the end of the sticks to hold them in place.
- 3) Place a billiard ball on each end of the track.
- 4) Predict what will happen when the balls are rolled toward one another.
- 5) Roll the balls toward one another. What did you notice?
- 6) Now put one billiard ball in the middle of the track, and then roll a second one from an end so that the balls strike.
- 4) What happens after the two balls hit?
- 5) Repeat the experiment, but this time have two billiard balls in the center and roll one billiard ball into them.
- 6) What did you notice?

## My Results

### Explanation

When the balls roll and collide, they experience an elastic collision because the balls bounce away from each other. Even though the collision is not perfectly elastic, billiard balls are very effective because they do not compress much, so more of the kinetic energy is conserved. Some of the kinetic energy is transferred into the noise when the balls hit, as well as from friction against the meter sticks. When the resting ball is struck, it begins to move, while the rolling ball nearly stops on impact. This is a good example of how the momentum, or the ball's mass in motion, is conserved, because the total momentum of the ball is the same before and after the collision. The kinetic energy and momentum are both conserved in this elastic collision. When the two balls are struck, only one ball continues, for the same reason. The moving ball has the same momentum after the collision and nearly the same kinetic energy.

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