



Curiosity Guide #601

Collisions

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

Bouncy Ball Drop

Investigation #3

Description

How bouncy is this ball? How about that ball? Bounce, bounce, bounce!

Materials

- Superball
- Ping-pong ball
- Tennis ball
- Golf ball
- Clay ball
- Deflated basketball
- Meter stick
- A friend

Procedure

- 1) Hold the meter stick so one end is on the ground.
- 2) Drop each ball one at a time from the top of the meter stick.
- 3) How close to the top of the meter stick did the ball bounce?
- 4) What happened with the clay ball or deflated basketball?

My Results

Explanation

When objects collide, they react different ways in the collisions. In an elastic collision, both momentum and kinetic energy are conserved, so the objects move apart with the same speed they had before they collided. Because there are other forces involved like gravity and friction, we can't observe a perfectly elastic collision in this investigation. If we had a perfectly elastic collision, the balls would bounce back to the same height as they were when dropped.

Before being dropped, each ball has potential energy, which changes to kinetic energy when released. At the point of impact, the ball has accelerated to its greatest kinetic energy. Some of the ball's kinetic energy is transferred into thermal energy from friction with the ground and minor squish of the ball's surface, creating a sound.

Any ball that bounces greater than 50 cm of the meter stick would be more elastic than inelastic. The superball tends to perform well because there is little compression and less energy transfer than with some of the other balls. The clay ball and deflated basketball are more inelastic because their shape compresses so much on impact that much of the kinetic energy is transferred. When molecules collide, they can have elastic collisions, conserving both momentum and kinetic energy.

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