

Activity

Bouncing Balls

Lab Preview

Directions: Answer these questions before you begin the activity.

1. Why is it important to drop both balls from the same height?

2. How is the cardboard box used in this activity?

What happens when you drop a ball on to a hard, flat surface? It starts with potential energy. It bounces up and down until it finally comes to a rest. Where did the energy go?

What You'll Investigate

How do balls differ in their bouncing behavior?

Materials

tennis ball
 rubber ball
 balance
 masking tape
 meterstick
 cardboard box

*shoe box

*Alternate materials

Goals

- Identify the energy forms observed in a bouncing ball.
- Infer why the ball stops bouncing.

Safety Precautions

Procedure

1. Determine the mass of the two balls.
2. Have a friend drop one ball from 1 m. Measure how high the ball bounced. Repeat this two more times so that you can calculate an average bounce height. Record your values on the data table.
3. Repeat step 2 for the other ball.

4. Predict whether the balls would bounce higher or lower if they were dropped onto the cardboard box. Design an experiment to measure how high the balls would bounce off the surface of a cardboard box.

Data and Observations

Bounce Height			
Type of ball	Surface	Trial	Height (cm)

Activity (continued)**Conclude and Apply**

1. Calculate the gravitational potential energy of each ball before dropping them.

2. As the balls fall, what happens to their gravitational potential energy and kinetic energy? What happens to their kinetic energy when they hit the floor?

3. Calculate the average bounce height for the three trials under each condition. Describe your observations.

4. How did the bounce heights compare when dropped on a cardboard box instead of the floor? Why? Hint: *Did you observe any movement of the box when the balls bounced?*

5. Use elastic potential energy to explain why the balls bounced to different heights.

Communicating Your Data

Meet with three other lab teams and compare average bounce height for the tennis ball on the floor. Discuss why your results might differ. **For more help, refer to the Science Skill Handbook.**