Curiosity Guide #403
Kinetic Energy

Accompanies Curious Crew, Season 4, Episode 3 (#403)

Bowling-Ball Pendulum

Investigation #3

Description

When is a bowling ball not a bowling ball? When it's a pendulum!

Materials

- Bowling ball
- Bowling pin
- Rope
- Screw eye
- Drill
- $\frac{1}{4}$-inch drill bit
- Swing set
- Small table

Procedure

1. Use a $\frac{1}{2}$-inch drill bit to drill a shallow hole in the bowling ball.
2. Twist the screw eye into the ball until the threading on the screw eye is no longer visible.
3. Tie one end of the rope through the screw eye.
4. Set the table up to one side of the swing set.
5. Place the bowling pin on the edge of the table.
6. Tie the rope over the swing set so that the ball hangs above the ground and when pulled back is directly beside the pin.
7. Pull back the ball so that the ball is touching the pin.
8. Let the ball go, but don't push.

9. What happened? Did the ball hit the pin? How close did the ball come?

My Results

Explanation

The action of lifting and pulling back the bowling ball creates gravitational potential energy, ready to swing down. At that point, the ball has maximum potential energy. As the ball begins to move, the potential energy changes to kinetic, or motion, energy. The total energy does not change, so when the ball gets to the bottom of the swing, it also has maximum kinetic energy. The ball will come close to the pin, but the ball won't hit the pin because that would require more energy than what was there at the start. Pushing the ball adds more energy, and the ball could hit the pin.

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