



Curiosity Guide #403

Kinetic Energy

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

Kinetic Yo-Yo

Investigation #4

Description

Unleash the potential energy of a fun toy!

Materials

- Yo-yo

Procedure

1. Wind up the yo-yo on the string.
2. Let the yo-yo drop.
3. Can you get the yo-yo to come back up without moving your hand?
Why?

My Results

Explanation

Yo-yos are a great example of the transfer from potential to kinetic energy and back again. When the yo-yo is held above the ground, the yo-yo has potential energy from the gravity that is already pulling it down. As the yo-yo falls, that potential energy changes to kinetic energy, which increases as the yo-yo falls down. As the toy climbs back up, the kinetic energy changes back to potential energy.

You might have noticed that for the yo-yo to come all the way back up, we need to push our hand down on the release and jerk the yo-yo upward to give the yo-yo additional kinetic energy. Otherwise, the yo-yo will not climb all the way back up. In addition to the potential energy and kinetic energy, there is also rotational kinetic energy, which makes the yo-yo spin. With each drop, you push the yo-yo down and jerk it back upward to provide enough kinetic energy to make the yo-yo come back up to your hand.

Think about this! Have you ever noticed that when you toss a ball up in the air, it appears to stop moving for just a moment before it begins to fall back down? This is a great example of energy transferring. You see when you toss the ball, you are adding kinetic, or motion energy, to the ball. There is a lot of motion energy at first when you let go, but as the ball goes higher, gravity is still pulling the ball down. The force of gravity decreases the ball's motion, and the ball's kinetic energy decreases and changes to potential energy. At the top of the toss, the ball has no more kinetic energy. All the energy has been stored as potential energy. But as the ball falls, the potential energy transfers back to kinetic energy.

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