



Curiosity Guide #403

Kinetic Energy

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

Spool Racers

Investigation #5

Description

Unleash the potential energy of a fun toy!

Materials

- Wooden spool
- Metal washer
- Toothpick
- Tape
- Rubber band
- Unsharpened pencil
- Scissors

Procedure

1. Slide one end of the rubber band through the hole in the center of the spool. Pull the rubber band through so there is a loop sticking out both ends.
2. Cut a toothpick so that it is shorter than the diameter of the spool.
3. Slide the cut toothpick through the rubber band loop on one end of the spool.
4. Tape the toothpick in place.
5. On the other end of the spool, feed the remaining rubber-band loop through a metal washer.
6. Place the unsharpened pencil on top of the washer and through the rubber-band loop.

7. Pull the rubber band a bit further. Make a knot in the band so that the pencil is pressed firmly against the metal washer.
8. Turn the pencil to wind the rubber band up.
9. Lay the spool on the floor and let go of the pencil.
10. Could you get the spool racer to move?

My Results

Explanation

Have you ever stretched a rubber band and held it in place? When you do, you can feel the tension in the band as it tries to shrink to its original shape. A rubber band has the potential to spring back when you let it go because of its elasticity. This is called elastic potential energy. Rotating the pencil twists and stretches the rubber band, creating elastic potential energy. Letting go of the pencil unwinds the rubber band and causes the spool to rotate on the floor. The energy transfers from potential energy to motion, or kinetic, energy.

Think about this! When an object is in motion, we say that the object has kinetic energy. That total energy is related to how fast an object is going and how much mass the object has.

When you compare someone driving a car to a person on a bicycle, which one has more kinetic energy? If you thought the car would have more, you're right! The car has a lot more mass and can go much faster than a bicycle can, so the car would have more kinetic energy. What is surprising is that if you double the mass of the moving object, the kinetic energy doubles too. However, if you double the speed of the object, the kinetic energy is four times more! Amazing!

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