WIND UP RACER

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Materials and Explanations

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Step-by-Step Photo Sequence
WIND UP RACER

Potential and kinetic energy displayed in this fun hands-on experiment. Finding creative, hands-on ways to demonstrate the difference between potential and kinetic energy can be difficult. Not to worry… that's why you have us! With some simple household items and a little creativity, the Wind Up Racer will have you racing a spool across the room in no time!

Materials
Spool
Toothpick
Rubber band
Tape
Metal washer (dryer optional)
Pencil

EXPERIMENT
1. Start by attaching a rubber band to a toothpick. So lay the rubber band out flat and put the toothpick on top of it. Create a loop with one end of the rubber band and pull the other end of the rubber band up and over the toothpick and through the loop on the other side of the rubber band. Think of the rubber band as an airline luggage tag and the toothpick as the luggage handle when you loop the rubber band over the toothpick.
2. Push the toothpick and the attached end of the rubber band through the center of a spool until it comes out the other side. Make sure to hold on to the end of the rubber band so that it doesn't go into the spool.

3. Pull the rubber band taut so that the toothpick lays flat on one end of the spool. Break the ends of the toothpick off so that it doesn't stick out past the edge of the spool.

4. Tape the toothpick to the end of the spool, holding it in place.

5. Pull the other end of the rubber band through the center of a washer.

6. Stick the pencil through the rubber band and twirl the pencil. This will twist the rubber band.

7. Once the rubber band is good and twisted, put the spool down on its side on a smooth surface and let it go. The spool takes off across the surface. Cool!

How Does It Work?

When you twist the rubber band with the pencil, you stretch the rubber band and wind it up. This winding and stretching creates and stores potential energy. Potential energy is energy that has the ability to do work in the future, but is not currently performing any work. The more twisting you apply to the rubber band, the more potential energy you create. When you put the spool down on a surface, the rubber band unwinds and converts the potential energy into kinetic energy, the energy of a moving object.
SPOOL  
TAPE  
WASHER  
TOOTHPICK  
PENCIL  
RUBBER BAND  
SCISSORS
FEED THE RUBBER BAND THROUGH THE SPOOL USING A TOOTHPICK
Break your toothpick so that it is just smaller than the diameter of the spool & feed it through the rubber band loop.
CUT A SMALL PIECE OF TAPE
4 Secure the toothpick to the spool using the tape.
5

Thread the rubber band through the washer on the other end of the spool.

SICK! science.
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PUT THE PENCIL THROUGH THE RUBBER BAND LOOP
WIND THE RUBBER BAND UP WITH THE PENCIL