deSTEMber
SCIENCE ★ TECHNOLOGY ★ ENGINEERING ★ MATH
PRESENTED BY: girlstart

Marshmallow Slingshot

How far do you think you can launch a marshmallow across the room? Use your knowledge of potential and kinetic energy to make your own marshmallow slingshot!

TEKS:

4.6A: Force, motion, and energy. The student knows that energy exists in many forms and can be observed in cycles, patterns, and systems. The student is expected to differentiate among forms of energy, including mechanical, sound, electrical, light, and heat/thermal.
6.8A: Force, motion, and energy. The student knows force and motion are related to potential and kinetic energy. The student is expected to compare and contrast potential and kinetic energy.

Materials:

- Golf pencil
- Hole puncher
- Jumbo marshmallow (or other object to launch, like a small ball)
- Pen or marker
- Scissors
- Tape
- 2 thin rubber bands
- 2 toilet paper tubes, or one paper towel tube cut in half

How To:

1. Cut one toilet paper tube in half lengthwise and squeeze it so that it makes a tube about half of its original diameter. Tape it closed so that it doesn't uncurl.
2. Punch two holes half an inch in from one end of the tube you just made, opposite from each other. The holes should both be on the same end of the tube, just on opposite sides.
3. Push the pencil through the two holes. Be careful not to tear the holes! If you do, you'll need to make new ones.

4. On one end of the other toilet paper tube, draw two short lines (about half an inch long each) straight down from the rim, about as far apart as the width of your pointer finger. Cut each line, making two slits. Do the same thing on the other side of the same rim, opposite the first set.
5. Push one rubber band onto each set of slits. Try not to bend the cardboard! If they bend open, tape them in place with the rubber band wrapped around them.
6. Slide the smaller tube (the plunger) into the larger tube (the grip) so that the small tube's pencil end is sticking out of the end of the big tube that does not have slits. The pencil should be on the opposite end of the rubber bands.
7. Stretch each rubber band and hook it around the end of the pencil.
8. Load a marshmallow into your slingshot. It should be resting on top of the plunger. Holding the outer tube, pull the pencil back to stretch the rubber bands. Release the plunger and watch your marshmallow fly across the room!
9. Do you think your marshmallow would go even farther if you pulled the slingshot back more? Compare how far your marshmallow flies when you pull the plunger back different amounts. Do you think it would make a difference if you used a smaller marshmallow?

STEM Explanation:

Things like slingshots work by storing energy in elastic materials, such as the rubber bands in this activity. The stored energy is called potential energy. The farther the rubber bands are stretched, the more potential energy is stored. When the rubber bands are released, the potential energy that has been stored up is converted into kinetic energy, which causes motion. This is how your marshmallow slingshot works! Some other things that work like this are trampolines, bows-and-arrows, and the shock absorbers on a bike.

Career Connection:

Physicists are scientists who do research in physics, which involves the study of matter and its motion through space and time, along with related concepts such as energy and force. More broadly, it is the general analysis of nature conducted in order to understand how the universe behaves.

Resource:

http://pbskids.org/designsquad/build/indoor-slingshot/