

How to Make a Rubber Band Car

Energy is neither created nor destroyed: it is only transformed. There are many different forms of energy, including **kinetic energy** (the energy of motion), **potential energy** (energy that is considered *stored* because of an object's position), **mechanical energy** (energy that performs work), and **thermal** (heat) energy. Kinetic and potential energy are often paired together in simple demonstrations, like dropping a book, jumping on a trampoline, or building cool machines like rubber band cars.

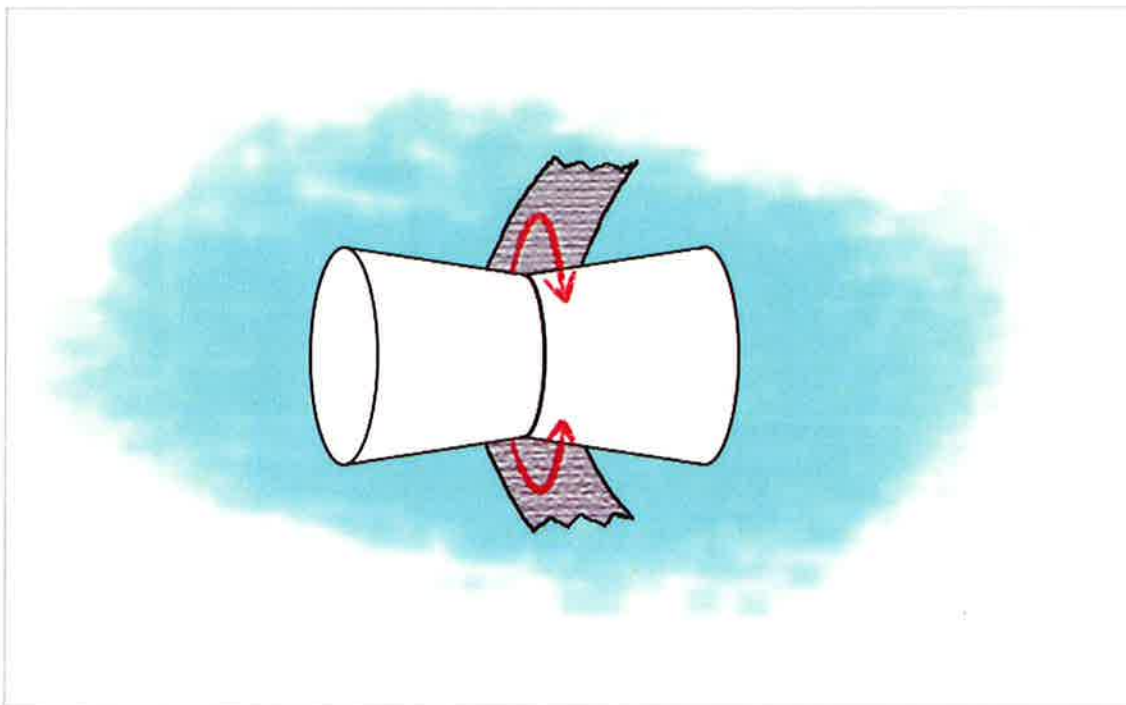
Problem: Learn how to make a rubber band car.

Materials

- Paper coffee cups or Styrofoam cups with lids (at least 2)
- Scissors
- Duct tape
- Disposable chopsticks
- Rubber bands (at least 3)
- Paperclips
- Pony beads
- Pencil or pen
- Metal washer
- Coin

Procedure

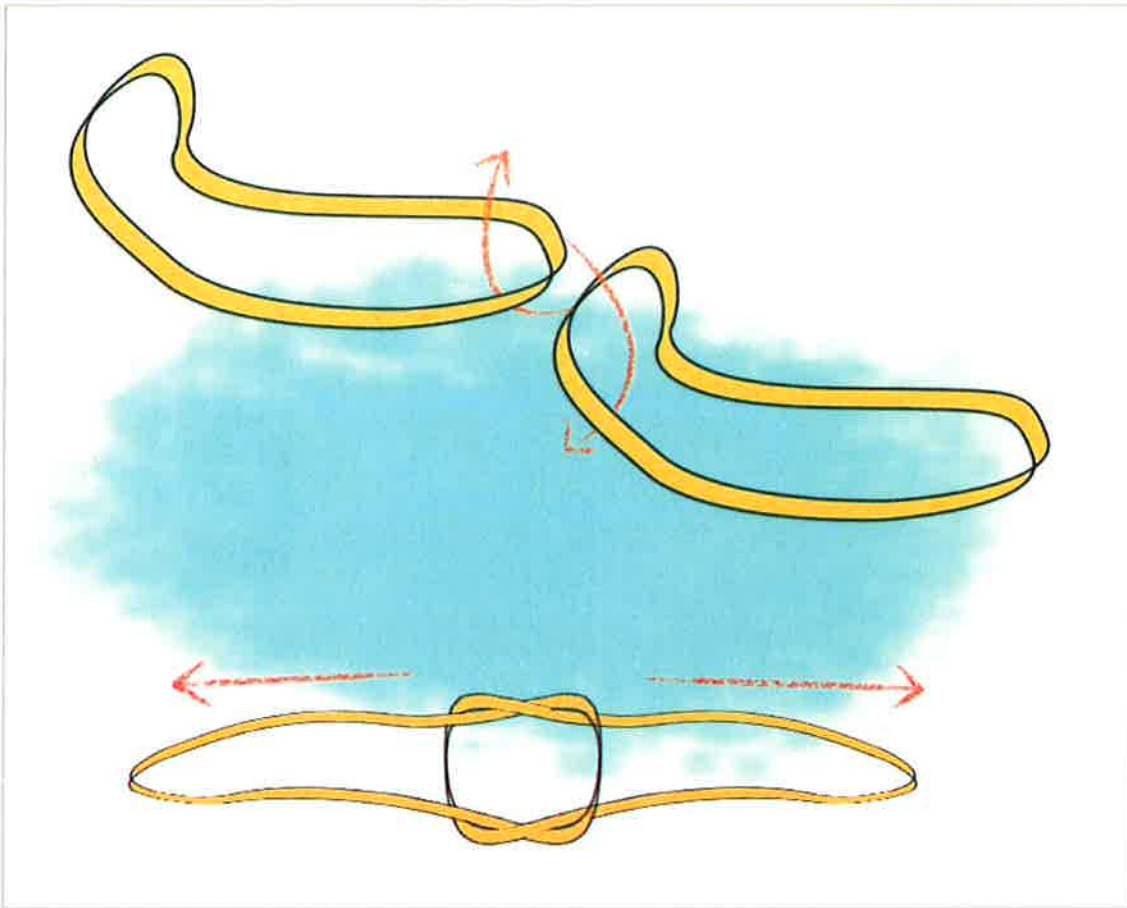
1. Gather the necessary materials.
2. Use a pencil to trace a circle on the bottom of each paper cup. Use the coin for a template.
3. Ask an adult to help you cut out the circles.
4. Put the bottoms of the cups together so the holes align. Use the duct tape to secure the cups together at the bases.



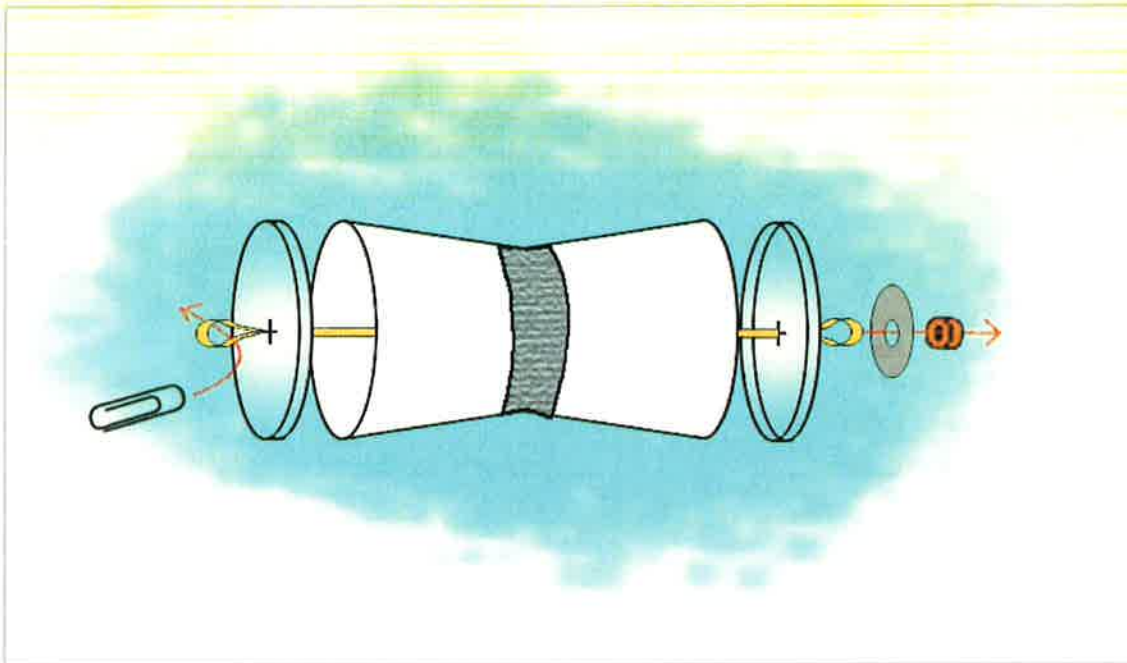
5. Using the pencil or pen, poke holes in the center of the plastic cup lids. If it is too difficult, ask an adult to help

you by using a knife or a pair of scissors.

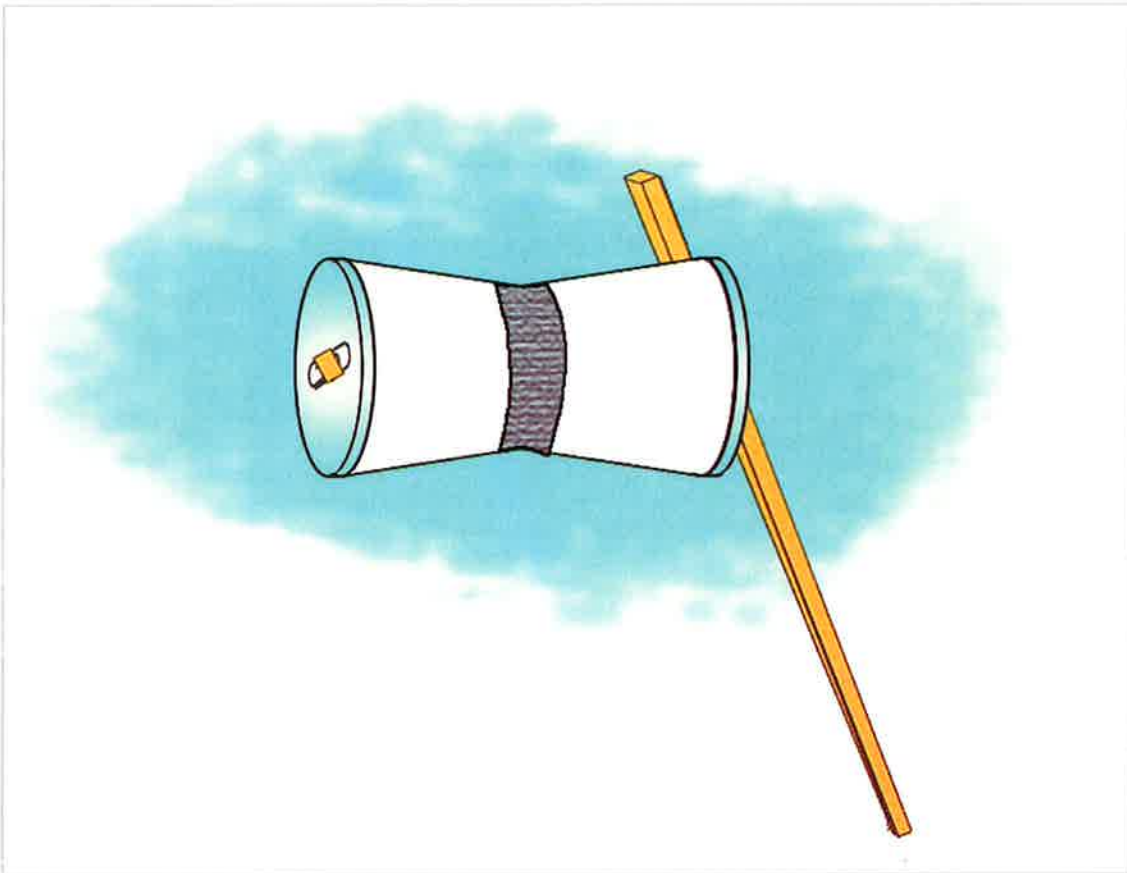
6. Connect 3 rubber bands together. To do this, insert one rubber band half way through the middle of another, and then tuck one side through the center of itself, like this:

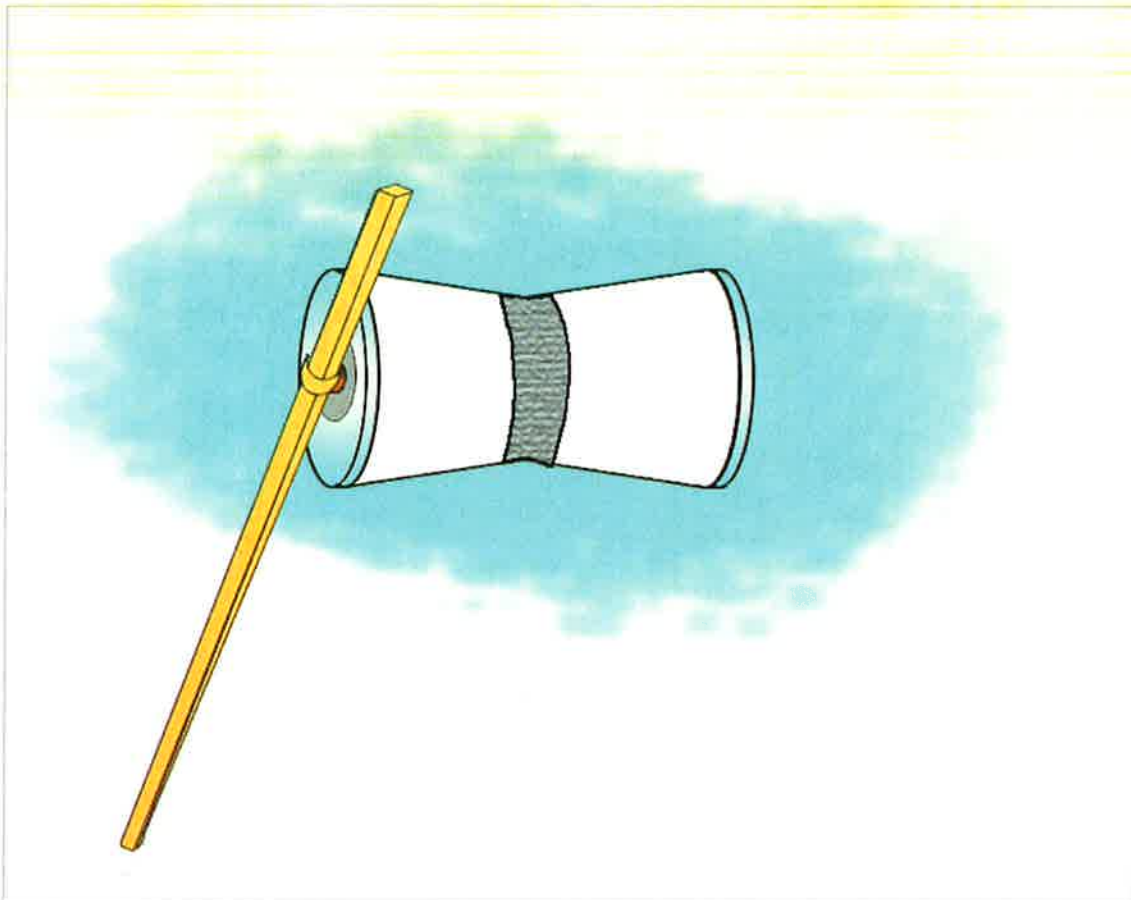


7. Insert your rubber band chain through the holes in the bottom of the cups.
8. Feed each end of the rubber band chain through the hole in each lid.
9. Attach the lids to the cups.
10. On one side, attach a paperclip to the rubber band so it cannot fall back into the cup.
11. On the other side, insert the rubber band through the middle of the washer.
12. After the washer, thread the rubber band through a pony bead. There will be a little loop coming out of the pony bead.



13. Thread a chopstick through the rubber band loop coming out of the pony bead.





14. Twist it up!
15. Set it on a surface and watch it go!

Extra: Try the experiment with different sized cups, or different sized rubber bands to see if the speed or behavior of your racer changes.

Extra: This same machine can be made with a plastic trashcan, a broomstick, and a bungee cord. If you're feeling particularly ambitious, give it a shot!

Results

The rubber band racer will speed forward.

Why?

Elastic **potential energy** is stored in the rubber band when you use the straw to twist it up. When the rubber band is released, the potential energy built up in twisting gets unloaded and turned into **mechanical energy**. The chopstick pushes against the ground as the rubber band unwinds so that the only place the mechanical energy has left to go is into the cups in the form of **torque**, or force around an axis. This enables your car to roll forward.