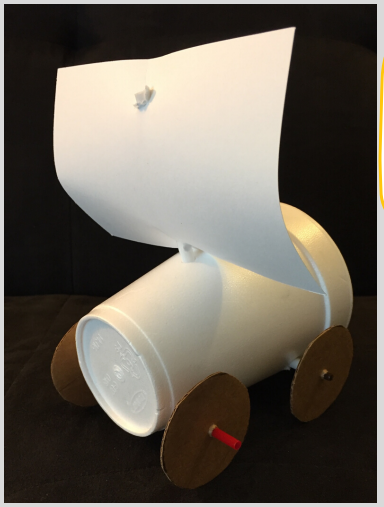
MAKER EXCHANGE
AT CORONA PUBLIC LIBRARY

activity

RECYCLED CAR: WIND POWER

THE CHALLENGE:

Build a moving vehicle from household parts that moves with the wind!



Follow along with the video! youtube.com/user/coronapublib

RECOMMENDED AGE

Ages 10 and up

TIME NEEDED

30 min - 1 hr

TOOLS & MATERIALS

- Styrofoam cup
- Thick paper or other stiff material
- Plastic Straws
- Skewer sticks or thinner straws
- Cardboard
- Scissors
- Ruler
- Tape

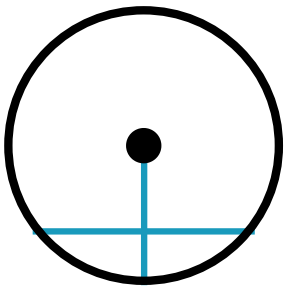
* * *

SECRET CODE
EXAMINE

To redeem your secret code, or to sign up for the Summer Reading Challenge, visit Corona.Bookpoints.org

GETTING STARTED-INSTRUCTIONS

STEP 1:PREP THE BODY



Using a ruler, mark a single line from the center of the nose of the cup to the outer edge. Halfway across this mark, make a straight line across the nose of the cup.

Then, continue each line from the nose to the wider mouth of the cup. Finally, poke the straws through the sides of the cup along this line, with one straw near the nose, and another near the mouth.

STEP 2:PREP YOUR WHEELS

Using a circular object (bottom of a soda can), trace and cut out 4 circles from a cardboard box.

PRO TIP: Need to make small holes in cardboard but not sure of the size? Start by poking it with a thumbtack and slowly insert the tip of a sharpened pencil to increase the diameter!

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QUESTIONS TO CONSIDER ???

Does it matter how large your wheels are?

Does it matter what shape your sail is? Or where you place it?

KEY TERMS

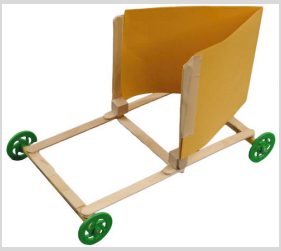
- Force
- Friction
- Potential Energy

SIMPLIFY

Have any toy cars laying around? Try finding creative ways to attach a sail to them!

EXTRA CHALLENGE

Play around with different sail shapes and angles! Do you see how it could make a difference?



RELATED RESOURCES

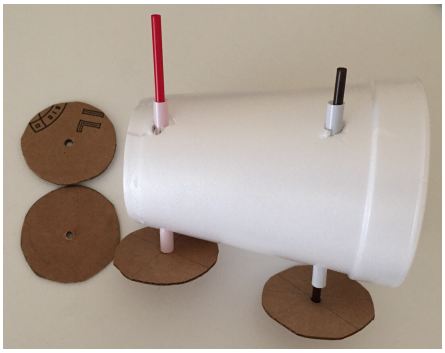
Lesson Video: https://bit.ly/2Uzzq3L

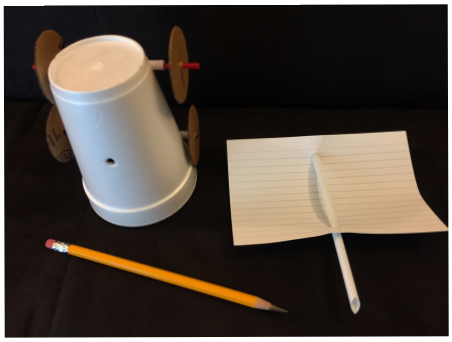
Build a Wind-Powered Car: https://www.scientificamerican.com/article/build-a-wind-powered-car/

INSTRUCTIONS CONTINUED...

STEP 3:PUT 'EM TOGETHER

Slide your skewers, or other axle material, through each straw. Use the ruler to mark the center of each cardboard circle, and poke each end of the skewer through the cardboard to make wheels.





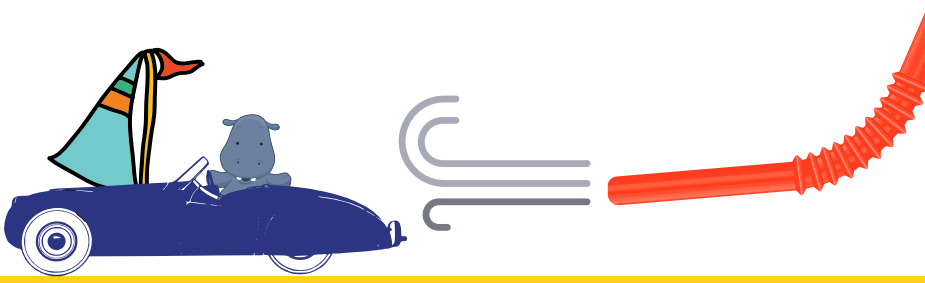
Mr. Martin poked a straw through the sail for a cool effect!

STEP 4:ADD THE SAIL

Cut out a rectangle of the size of your choosing from an index card, or piece of paper. You may fold your paper and tape down the open end for better stability. Tape this sail to another straw, skewer, or stick-like object and ta-daa!

STEP 5:RACE IT!

Grab an extra straw, and use it to blow air right onto your sail to move your car forward!



MAKER EXCHANGE
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activity

RECYCLED RACECAR: RUBBER BAND EDITION

THE CHALLENGE:

Create a modern adaptation of a classic toy, the spool racer, using recycled household items.

RECOMMENDED AGE

12 and up

TIME NEEDED

30 mins -1 hr

TOOLS & MATERIALS

- Options for creating the "spool": cylindrical device, popsicle sticks, cardboard, old CDs
- Options for wind up mechanism: pencil, pen, dowel, straw
- Options to hold rubber band in place: paperclip, toothpick, tape, washer or bottlecap with hole in the middle, hot glue
- Rubber bands

SECRET CODE
EXAMINE

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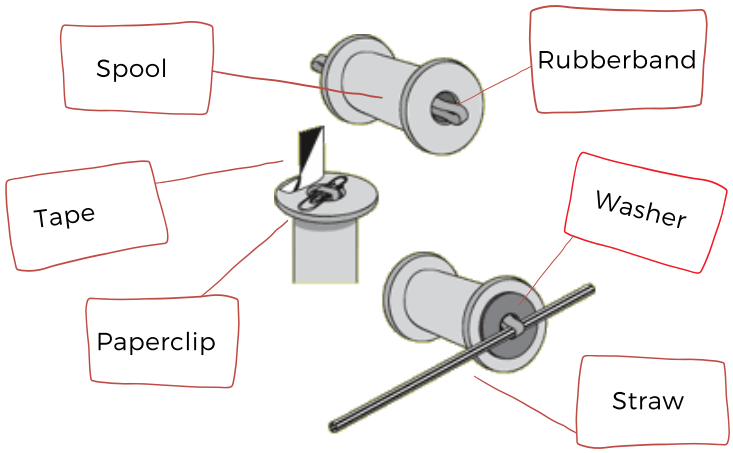
GETTING STARTED-INSTRUCTIONS

STEP 1: UNDERSTANDING A CLASSIC TOY

A spool racer is a simple wind up toy that requires a few household items.



STEP 2: DESIGNING YOUR OWN VERSION

Gather your materials. There are many variations of a spool racer. Each item can be substituted for other items to create your own version. The important thing is that they function the same way.

STEP 3: BUILD YOUR RACER

- Create your "spool".

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RECYCLED RACECAR: RUBBERBAND EDITION

QUESTIONS TO CONSIDER

- How straight does the racer go?
- How can I optimize my racer's performance for either distance or speed?

KEY TERMS

- Potential energy
- Kinetic energy

SIMPLIFY

Try the classic version by making your race car with a spool of thread.

EXTRA CHALLENGE

- Improve your racer's traction and power to go up a cardboard ramp.
- Give your race car a paint job.

RELATED RESOURCES

- Lesson Video: https://bit.ly/2Uzzq3L
- Plastic Bottle Option: https://www.exploratorium.edu/snacks/bottle-racer
- CD Race Car: https://www.instructables.com/id/Recycling-CDs-Into-Race-Cars/
- Science Max Giant Racer: https://www.youtube.com/watch?v=zjbrVWlRoBQ

INSTRUCTIONS CONTINUED...

- Ms. April used a can of corn as a base by opening the can from both sides. With hot glue, she attached old CDs to each end to create wheels.

- Slip the rubber band through the center of the "spool". If it gets stuck, use a pencil or dowel to push it through. The rubber band should be a little longer than the spool. You can loop rubber bands together to create a longer rubber band.
- Slide the paper clip or toothpick through one loop of the rubber band. Tape or glue it down.
- Pull the other end of the rubber band through the washer. Glue it down if using a bottlecap. Then, slide the pencil or dowel through the rubber band loop. *See images on page 1 for examples

STEP 4: LAUNCH YOUR RACER

Wind up the dowel or pencil 20 times or so. This will create and store potential energy in the rubber band. Put the racer on the floor or a tabletop and let it go. As the rubber band unwinds, this potential energy transforms into motion energy called kinetic energy.

STEP 5: CLICK AND SHARE

Take a photo or video of your racecar and share with us!

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