Rubber Band-Powered Car

Mechanical Power

Ages 7–10

Approx. 1 hr

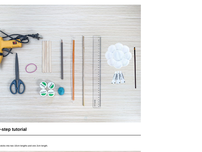
Intermediate difficulty

Elementary school

In this activity, you'll design a small car powered solely by rubber bands. How would you design it to make it run faster or farther? There are many physical principles hidden in this little device—let's explore them together!

Materials Needed

- hot glue gun
- scissors
- wooden skewers
- 9 lolly sticks
- rubber bands
- pencil
- ruler
- drinking straws
- cardboard tube
- cups
- paper towels
- glue sticks
- pliers
- paintbrush



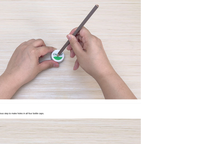
Step-by-step tutorial

Step 1

Cut the wooden skewer into 12cm lengths (and one 3cm length).

Step 2

Place a wooden under the bottle cap. Use a sharpened pencil to make a hole in the center of the bottle cap, ensuring the hole is large enough so the wooden stick is able to fit through.

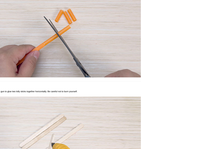


Step 3

Repeat the previous step to make holes in all four bottle caps.

Step 4

Cut four 12 cm pieces from the drinking straw.



Step 5

Use the hot glue to glue two lolly sticks together horizontally. Be careful not to burn yourself!

Step 6

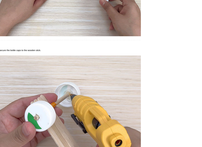
After the hot glue has solidified on the lolly sticks, glue the four 12cm straw sections into the lolly sticks as shown in the diagram.

Step 7

Repeat a third wooden stick through one bottle cap.

Step 8

As shown in the diagram, thread the wooden stick from the previous step through the straws on the top lolly sticks. Then insert another bottle cap into the other end of the wooden stick.



Step 9

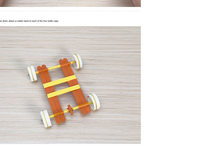
Use the pliers to bend a small hook in one end of the wooden stick so that it can fit into the bottle cap hole.

Step 10

Use the glue to attach the 3cm wooden stick in the middle of the wooden stick on the right-hand side of the pressure car.

Step 11

Cut two thick straws in half, then use them to attach them to the middle section of the pressure car as shown in the diagram. Once the car and the rubber band are in place (rubber band is included in the next instruction), it will resemble this:

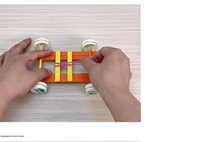


Step 12

After the glue has dried, attach a rubber band to each end that has bottle caps.

Step 13

Finally, secure the rubber band to the middle lolly stick as shown in the diagram.



Step 14

Finally, secure each rubber band around the wooden axle the 12cm wooden axle.

Step 15

Insert the 12cm bamboo/wooden axle straws.

Step 16

Your pressure car is now ready to go—release it and watch it move!

The Science Behind It

When you pull back the car, you're storing energy in the rubber band, much like a stretched spring. When the rubber band is released, this potential energy rapidly converts to kinetic energy, causing the wheels to rotate and begin moving. Whether the car moves forward also depends on the friction between the wheels and the ground. Friction is the resistance force created when two surfaces rub against each other. If the wheels have enough friction with the ground, they can grip it and push the car forward. However, if friction is too high, the car might not move smoothly. If it is too low, the wheels might spin without gripping.

This is why we put rubber bands around the wheels. Try testing the powered car with and without rubber bands on the wheels on both smooth and rough surfaces—what conclusions can you draw?

Try redesigning your wheels using different materials and test them to find the optimal design for your car!

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