BALLOON POWERED CAR

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BALLOON POWERED CAR

The power of air pressure propels a racer across the room

Materials
• Foam core or corrugated cardboard
• Wooden barbeque skewers
• Regular cardboard
• Straws
• Tape
• Balloons
• Scissors

EXPERIMENT
1. Start off by cutting the chassis of your car. We don't condone the use of blow torches or saws during Sick Science experiments, so you have to create the chassis using scissors and foam core (corrugated cardboard works great, too). Cut a 6x3 inch piece of your chosen material using the scissors.
2. A car is nothing without axles. Given the size of your car, wooden barbeque skewers will make perfect axles. Use wire cutters to snip two 4" pieces of skewer.
3. You need to mount the axles to your chassis in a way that allows the axles to turn freely. For mounts, cut two 3" sections of straw and use tape to fix the mounts to the front and back (3" sides) of your chassis.
4. Now that you have axle mounts, mount your axles! Slide the wooden skewers through the middle of the straws.
5. Axles are great, but humans invented the wheel for a reason. The wheel was invented for use on the Balloon Powered Car! Use scissors to cut four quarter-sized pieces of regular cardboard. If it helps, you can trace a quarter or circle of similar size to give yourself some guidelines.
6. Push the cardboard circles onto the skewers, one on each end of both skewers. Without needing lug nuts or a compression wrench, you've mounted your wheels!

Anyone who has ever built a car from scratch will tell you that the engine is the most complicated piece, and the balloon powered car is no different. Hope you're ready!

1. Cut the mouth ring (the lip that you blow into) off of the balloon. This will allow for a better seal between the balloon and the exhaust pipe.
2. For the exhaust pipe, insert a straw approximately 1" into the balloon. Use tape to securely fasten the straw inside the balloon. The tighter the seal, the better your exhaust pipe is going to work, so make sure as little air as possible can escape.
3. Mount the exhaust pipe so that the point where the straw and balloon connect is about 1" from the end of your chassis. Taping it at this point is your best bet. Secure the straw so that it points straight out from the chassis.
4. Inflate the balloon and pinch the straw to keep air inside the balloon. Place the racer on the ground and let it go!

To personalize and adjust your car:
• Make a fun design on your chassis to make it look funky and fresh (if that's what the kids are calling it these days).
• Adjust the size of your wheels to see if size affects the distance your car can go.
• Trim your straw or try different straw sizes to see which exhaust system supplies the most thrust.
HOW DOES IT WORK?
The concept behind the Balloon Powered Car is pretty simple, but that doesn't make it any less impressive! When you blow up the balloon, set your racer down, and let it go, escaping air from the balloon rushes out of the straw causing propulsion. The principle at work is Newton's Third Law of Motion, which states that for every action, there is an equal and opposite reaction. In the case of the Balloon Powered Car, the action is the air rushing from the straw. The reaction is the movement of the car!

The moving Balloon Powered Car has kinetic energy, but even an object that isn't moving has energy. This energy is called potential energy. The potential energy of the car is in the elastic material of the balloon. As the balloon fills with air, it builds more potential energy. As the air flows from the balloon, it changes to kinetic energy. This is the conservation of energy.
HERE IS WHAT YOU NEED

FOAM CORE 3”x6” inches
STRONG TAPE
CAP
2 STRAWS
X-ACTO BLADE
PENCIL
WOODEN SKEWER
SCISSORS
RULER
CARDBOARD
BALLOON
1. Measure two 3 inch pieces of straw.

CUT TWO 3" PIECES OF STRAW
2. Tape the two straws to the base.

3. Cut the end off the balloon.
4. Place the balloon over the end of the straw and tape it so that it is airtight.

5. Tape the straw to the top of the base.
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Measure two 4 inch pieces of BBQ skewer.

Cut the measured axles.
ATTACH THE AXLES

USE A CAP TO TRACE 4 WHEELS OUT OF CARDBOARD

CUT OUT THE WHEELS
USE THE REMAINING END OF THE SKEWER TO POKE HOLES IN THE WHEELS

ATTACH THE WHEELS TO YOUR RACER
FUEL UP YOUR RACER BY INFLATING THE BALLOON
TRY SOME DIFFERENT CUSTOMIZED CAR DESIGNS

HOW WOULD YOU CHANGE THE DESIGN TO MAKE THE CAR GO FURTHER
WHY DO YOU THINK THIS WOULD WORK