BALLOON CAR EXPERIMENT

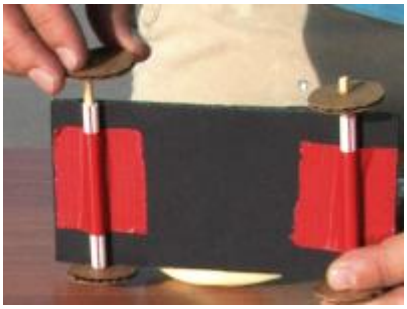
MATERIALS

- 2-3 DRINKING STRAWS
- HEAVY TAPE
- SCISSORS
- 2 WOODEN BBQ SKEWERS
- CARDBOARD OR FOAM CORE BOARD
- BALLOON
- WIRE CUTTERS

THE PROCESS

1. Start off by cutting the chassis of your car from a piece of foam core or heavy duty cardboard. Have your parents help you use scissors to cut a 6x3 inch piece of your chosen material.
2. A car is nothing without axles. Given the size of your car, wooden barbeque skewers will make perfect axles. Get your parent's help to 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 of your chassis. Slide the wooden skewers through the middle of the straws.

4. Axles are great, but humans invented the wheel for a reason. Get help using 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.
5. 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. (Make sure your car still has its wheels. They were only removed in this photo to show you where to tape your engine!)

4. Inflate the balloon and pinch the straw to keep air inside the balloon. Place the racer on the ground and let it go!

MAKE IT YOUR OWN!

There are a ton of things you can do to personalize and adjust your car:

- 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.
- Create a competition with a group of friends or family members. First decide if the fastest car or the car that travels the furthest is the winner. Have everyone design and construct their own cars for the contest.

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.

Adapted from: http://www.stevespanglerscience.com/lab/experiments/balloon-powered-race-car#sthash.ThkDbwPl.dpuf