



Balloon Jet Car

Let's make a simple car structure: two axles with wheels that turn, that can be used for lots of different types of car.

Then let's turn this simple car into a jet car!

It's not difficult - and the car should be able to travel more than 6 metres. That makes it a good contender for a distance event in a 'Vehicle Olympics'.



Equipment

1. A small box or carton, for example a milk or fruit juice carton. It should be approximately 5cm x 5cm x 12cm in size.
2. Two small drinking straws (each about 6cm long). Alternatively you could cut a longer straw in half.
3. One longer drinking straw (about 10cm long).
4. Two wooden dowels or rods (8cm long, and 5mm in diameter). Dowel is a special type of wood that is round, like a pencil. You can buy dowel cheaply from any 'Do-it-yourself' store.
5. Four plastic bottle tops, a balloon, two elastic bands, some sticky tape, a hammer and a small nail.

Safety Stuff

Make sure you check with an adult before you begin any of these projects, because you'll probably need their help for parts of them.

Working with items such as scissors can be dangerous, so be very careful when you use them, and make sure that you never leave them open or lying around where smaller children can reach them. When you use dangerous tools like these, always make sure you put them down in a safe place where you can easily see them. Don't lose them under your bits of paper, or fabric, or other stuff that you're working with: do that and you'll end up tripping over them or cutting yourself!

Before starting any of these projects, cover the work surface you're going to use with some newspaper or an old cloth, and make sure that you're wearing an apron or some old clothes. Gather together all the items you'll need before you begin. Most of the things you'll need can be found by simply hunting around the house, but remember to check with an adult before you take anything. Otherwise you might not be very popular!

Don't forget to tidy up afterwards and don't leave any of the vehicles lying around when you have finished making them. If any are left on the floor, other people could trip over them and injure themselves.

Steps

Step One

Start by gluing the sides of the two short straws onto the bottom of the box. These will form the first part of the axles for your vehicle.

Then make the wheels. First, ask an adult to help you make a small hole in the centre of each of the four bottle tops, using a hammer and small nail. Push one of the bottle tops onto the end of one of the wooden dowels. It needs to be pushed on quite tightly, as these will form the wheels and axles of your vehicle. Repeat this with the second dowel.



Step Two

Next, push each dowel through one of the straws on the bottom of the box. Then attach the other two bottle tops onto the other ends of the dowels.

This is the base of your vehicle. The front wheels (on one axle) move independently of the back wheels, but the vehicle is difficult to steer, as all of the wheels do not move independently.

Can you design and make a car with four wheels that all turn independently so that the vehicle can be steered?



Step Three

Now attach the balloon to the car to make it move.

Put the long straw into the neck of the balloon. Push it in about 2cm and then secure it with an elastic band.

Make a hole in one end of the box and push the straw and balloon through. Set the straw at an angle so that the end of it is pointing towards the floor. Hold the straw in place by wrapping an elastic band around it on the outside of the box.

Step Four - Driving

Your balloon jet car is now ready to be raced!

To use your balloon jet car and see how far it will travel, start by blowing through the straw to inflate the balloon. When it is inflated as much as you dare (!), pinch the end of the straw to stop the air from escaping.

Now put the car on the floor and let it go!



Enter the Vehicle Olympics!

When you have built some vehicles you can test them to see how they perform. You could compare the vehicles you have made against each other, or you could test your vehicles against some that your friends have designed and made. The competition can be held between individuals or with small teams working on different vehicles.

Find a large open space to hold your Vehicle Olympics. For a water event you will need to find a bath or body of water, such as a small pond, that you can hold the race on. You should make sure that an adult is present if you are using an open body of water, as this can be dangerous.

Start by allowing each team to have a trial run. The teams can then have some time to carry out any improvements to the design of their vehicles.

Then hold the final race run. How far did the furthest vehicle travel? Did they all make it past a certain distance? Which vehicle travelled the fastest? Which vehicle won?

After the race, get the different teams together and see if you can think about why some of the vehicles did better than others. What improvements could you make to the various designs? Can you combine the best of each design to build a super-vehicle?