

Sauce Bottle Rocket

On SCOPE's On the Move episode, Julia turns a sauce bottle into an air-powered rocket!
Here's how you can do it at home:



What you need:

Scissors
Empty sauce bottles of different sizes
Thick plastic straws
Thin plastic straws
Plasticine

What to do:

1. Cut the thicker straw so it is shorter than the thinner straw.
2. Twist open one sauce bottle and attach the thin straw to the top using plasticine.
3. Test squeeze the bottle to make sure air is coming out through the straw (and not through gaps in the plasticine).
4. Cover the end of the thick straw with a piece of plasticine.
5. Place the thick straw over the top of the thinner straw attached to the bottle.

Squeeze the bottle.

6. Watch as your straw rocket flies high in the air!
7. Repeat using different lengths of straws and different size bottles – you'll notice a difference in how high the straw goes.



What's happening?

When you squeeze the sauce bottle, all the air in the bottle is forced to travel through a small hole, so the air comes out at a high pressure and speed. The air then hits the blocked end of the thick straw and creates enough force for the straw to be launched upwards.

When you change the size of the bottles, you are changing the size of the air chamber. A larger bottle has a larger chamber, so there will be more air to squeeze out. A smaller bottle will have less air inside the pressure chamber and less air to power the rocket. But does more air mean the rocket flies higher? Well maybe not. In larger bottles, the air might get trapped in creases of the plastic and won't shoot out the top.

There are a few other factors that come into play – for one thing, the thickness of the bottle. Thicker plastic will be harder to squeeze, and the restriction will cause the air to move slower and have less pressure. This means the straw won't travel as high. Thinner plastic will be easier to squeeze and the air should move faster.

And don't forget to consider the physical strength of the scientist behind the bottle. Different people will squeeze the bottle with a different amount of force. As hard as they try, the same person will even squeeze the same bottle differently in different trials.

So many possibilities! Young scientists will have to experiment with many different kinds of bottles to find out which one makes the best rocket.