

Launch a rocket

Make rockets out of baking soda and vinegar and see which one soars the highest!

Suitable for Beavers, Cubs and Scouts

You will need (per rocket)

- large plastic bottle
- three sturdy paper drinking straws
- red, yellow and green vinyl tape
- clear sticky tape
- a cork
- cardboard
- white vinegar
- baking soda (bicarbonate of soda)
- funnel
- scissors
- paper towels

Instructions

1 Divide your section into small groups. Ask each group to take a bottle and tape three straws to it. They should be positioned at the drinking end so they act as a stand for the upside-down bottle. The straws are secured in place by wrapping tape around both them and the bottle several times.

2 Next, ask the young people to draw four rocket fins on a piece of cardboard and cut them out. Each one should then be wrapped with a layer of red vinyl tape, making sure the fin shape is retained. Using clear tape, stick a fin to each side of the bottle.

3 Ask the group to make a cone out of cardboard for the top of the rocket, securing it with clear tape. It should fit over the bottom of the bottle. Cover the cone with red tape then stick a layer of yellow tape over the tip. Cover the join with a strip of green tape then secure the cone to the bottle.

4 Next, ask the young people to make sure the cork fits the bottle correctly. If necessary, they can use some tape to make it fit more securely. The cork needs to be tight enough to allow pressure to build up in the bottle once baking soda is added, but not so tight it won't be forced out by the pressure.

5 Ask the young people to take the bottle outside, along with the baking soda, paper towels and vinegar. Find a safe place to launch the rocket, keeping away from any walls and windows.

6 Pour a tablespoon of baking soda into a paper towel. Wrap the soda with the towel, making a sausage shape so it can be inserted in through the neck of the bottle (but don't do this yet). The paper towel acts as a time release, allowing enough time to step away from the bottle before it takes off. Make sure the group stands at least five feet away from the rocket.

Time needed
45 minutes

Badge



Rolls-Royce partners the Cub Scientist Activity Badge

Partner



Outcomes

Talk to your section about the chemical reaction that occurs within the bottle. The baking soda contains sodium bicarbonate and the vinegar contains acetic acid. When these two elements are mixed, carbon dioxide forms and builds up inside the corked bottle. The pressure forces the top off and causes the rocket to 'fly'.

Taking it further

Suggest the young people discuss the shape of the rocket they built and think about why it is important for flight, especially the fins and the nose. Ask them what they would change about the design to make the rocket reach a certain height. If they were to design a rocket that had the capacity to carry a fragile object, such as an egg, what kind of design changes would that need?

More information

Rolls-Royce partners the Cub Scientist Activity Badge to inspire young people about science, technology, engineering and maths. Fun and educational activities like this aim to take the fear out of science for Cub leaders and support Cubs in achieving their Scientist Activity Badge. Learn more at: scouts.org.uk/rollsroyce.

7 Pour the vinegar into the bottle until it is half full, then insert the parcel of baking soda. At the same time, replace the cork swiftly and then turn the bottle upside down. Step back quickly and watch as the rocket launches into the air!