Highclare School
#StayHomeSaveLives

Newton's 3rd Law – Garden Rockets

Equipment (Get this ready before you start)

A plastic bottle and a cork that will fit snuggly in the top
Vinegar (white or malt is fine)
3 wooden/plastic sticks (pencils would work) and Sticky tape
Cardboard or paper to make the fins and cone of the rocket
Bicarbonate of Soda
1 piece of toilet tissue
A small piece of blu-tak
(Stop watch – to be extra scientific)

Method

1) Turn the (empty) bottle upside down and attach 3 sticks (pencils) with tape to the sides to make a stand. See the picture to look at how it should be attached. Check it will stand freely.
2) Use the cardboard to design a cone and some fins to make your bottle look like a rocket. (Don't make it too heavy) There is a template attached if you would like a little help.
3) Lie your piece of toilet paper flat and put 1 teaspoon of bicarbonate of soda in to the middle then wrap it up in to a little packet and use the blu-tak to secure it to the end of the cork that will be in the bottle. You could (ask an adult to) use a staple if it won't stick very well. (This little packet buys you a little time to get clear of the rocket before it launches!)
4) Add approx. 5cm of vinegar to the bottom of your bottle (turn it the right way up!)
5) Take your rocket somewhere to launch it – the garden is advised or an open space outdoors.
6) Push the cork in to the bottle carefully so the bicarbonate of soda package doesn't fall in.
7) Turn the rocket upside down and place on the floor then stand clear. (If you have a stop watch you should start it now and time how long it takes to launch). 10….9….8….7….6….5…4…3…2…1….

Spectacular Science!

The bicarbonate of soda and the water react to form carbon dioxide gas. With th cork pushed in tightly, the gas being formed causes pressure to build up until the cork is forced out sending the rocket in to the air. The rocket is a great demonstration of Newton's 3rd Law of motion: "For every action there is an equal and opposite reaction". As the rocket pushes the gas out, the gas pushes against the rocket forcing it in to the sky! Now you really are a rocket scientist!

If you would like to **investigate further** think about the following: Does it matter how much vinegar we use? What about the bicarbonate of soda? What happens to the mass as we add more vinegar? How does that affect the flight of the rocket? Have fun!

Highclare School
#StayHomeSaveLives

Newton's 3rd Law – Garden Rockets