



# Fizzy bottle rockets

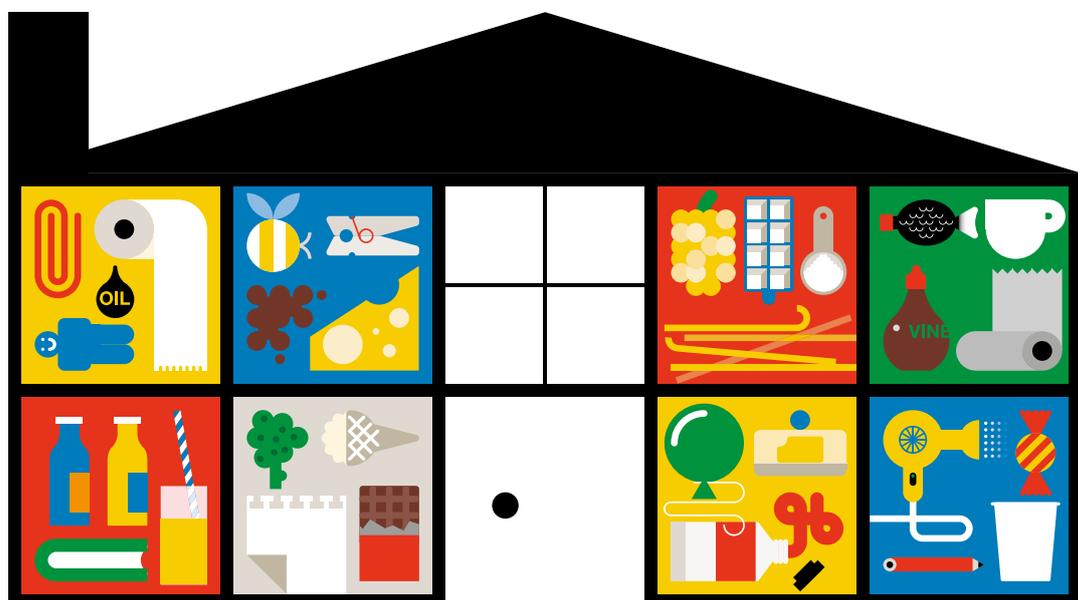


## The activity

Make a self-propelled rocket from a juice bottle.

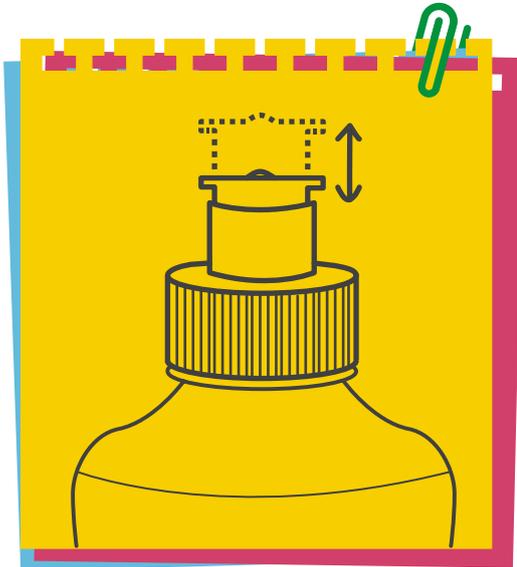
ExpeRiment with the 'fuel' for the rocket.

Learn how a chemical reaction which produces gas can be used to propel a rocket.





### What you'll need



- Small (500ml or less) drinks bottle with a sports cap lid which pops open (see left. The 200ml and 300ml Fruit Shoot bottles worked particularly well).
- Fizzy headache or vitamin tablets (Alka Seltzer or Berocca type tablets).
- Mug or glass or jar that allows upside-down bottle to fit inside, with lid touching bottom.
- Warm water from the hot tap.

**Take great care if using tablets with paracetamol or other medicines in them. They should not be consumed by children. The activity can also be done with fizzy vitamin tablets.**

### What to do

Show children what happens when you drop a tablet into a glass of cold water. Explain that the bubbles are made because the tablet and the water react to make carbon dioxide gas. If using headache tablets, explain that the liquid is not for drinking.

Repeat this with a glass of much warmer water – you should see a difference in the way the tablet reacts with the water.

Unscrew the lid of your bottle and make sure pop up lid is firmly pressed down.

Half-fill the bottle with warm water.

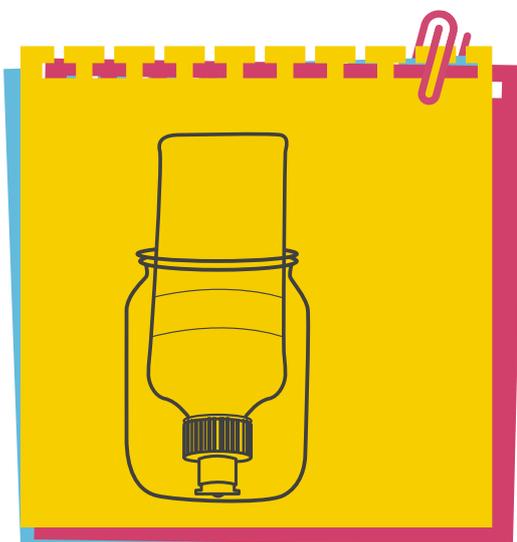
Break two fizzy tablets in half and drop them into the bottle.

Quickly screw lid back on firmly, give bottle a quick shake and place upside down in mug or glass or jar (left).

Stand back and wait.

Allow at least three minutes to pass before checking rocket. If it has not launched, try again with slightly warmer water.

You can experiment with the temperature of the water to get your perfect fuel mixture.





### Questions to ask children

#### When tablet is put in glass of water:

What do you think is in the bubbles?

Where do you think the bubbles are coming from?

What do you think would happen if we used more than one tablet? Why?

What do you think would happen if we used warm water? Why?

#### Before making rocket:

What do you think will happen if we put some tablets and water in this bottle and close the lid? Why?

What things could we change to make the rocket go higher?

### The science

Fizzy headache/vitamin tablets contain a chemical which reacts with water to produce carbon dioxide gas. This gas builds up inside the bottle until the pressure is enough to pop the lid. When the lid pops, it pushes down on the bottom of the glass, which results in an upwards push on the bottle, a bit like the way you can jump up in the air by pushing down on the ground. Once in the air, the liquid coming out of the bottle pushes it along in the same way as the gases coming out of a real rocket propel it upwards.

One of the things you can investigate with this activity is how the temperature of the water affects the reaction. You should find that the hotter the water, the more vigorously the tablets produce a gas.

This is because, in hot water, the particles of chemicals from the tablet and the water molecules have more energy and move more quickly. This means they collide with each other more often, which results in more chemical reactions in a given time.

#### Being safe

The fizzy headache tablets contain medicine which should not be consumed by children. Seek medical advice if you child accidentally eats a tablet or drinks the liquid from the rockets.



### Going further

Experiment with different sizes of bottle and different combinations of water and tablets to find out what combination gives you the highest flying rocket. Does it matter how many tablets you use? What about if you break the tablets into smaller pieces? How does the temperature of the water affect things?

Watch a flame powered bottle rocket: <http://bit.ly/FlamingBottleRockets>

Learn more about propulsion by building a balloon powered car: <http://bit.ly/BalloonCars>

