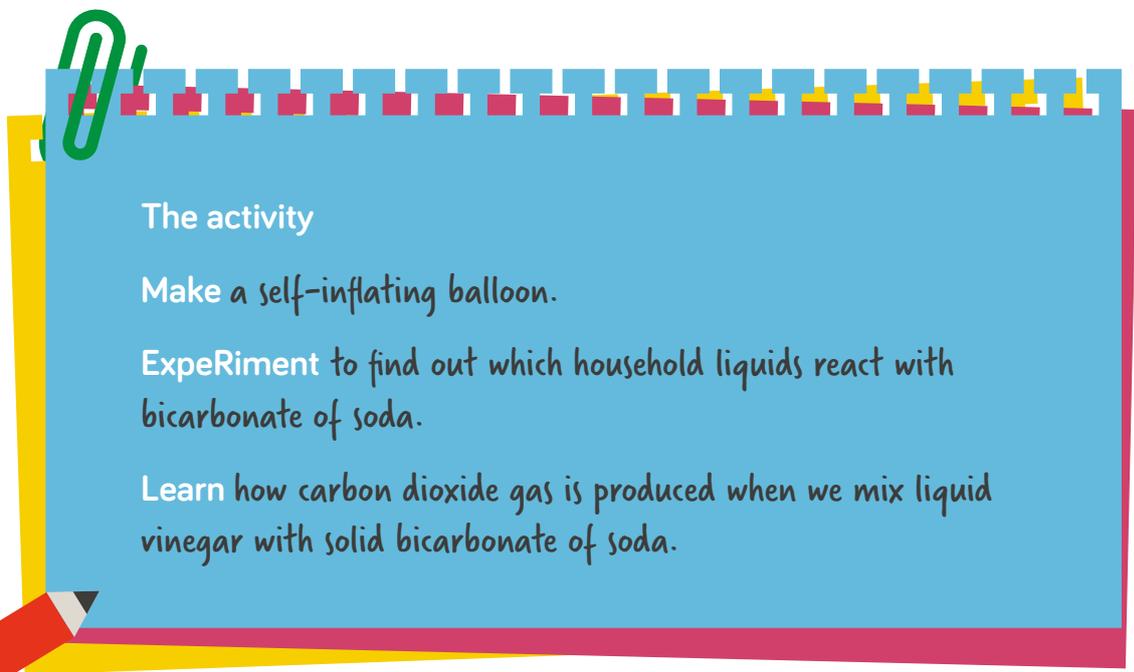
A yellow rectangular piece of paper with a scalloped top edge, held by a pink paperclip in the top right corner. The text "Fizzy cubes" is written in purple on the paper.

# Fizzy cubes

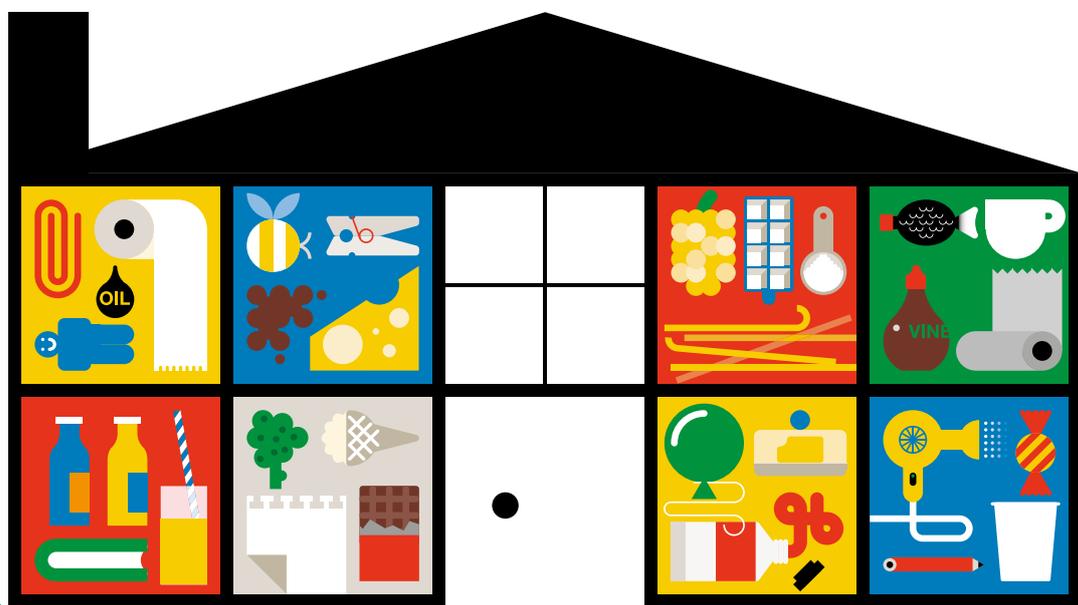
A blue rectangular piece of paper with a scalloped top edge, held by a green paperclip in the top left corner. A red pencil is positioned diagonally across the bottom left corner of the paper. The text "The activity" and its description is written in white on the paper.

The activity

Make a self-inflating balloon.

ExpeRiment to find out which household liquids react with bicarbonate of soda.

Learn how carbon dioxide gas is produced when we mix liquid vinegar with solid bicarbonate of soda.





### What you'll need

- Bicarbonate of soda
- Ice cube tray
- Vinegar
- Balloon
- Empty soft drink bottle (500ml)
- Funnel or sheet of paper
- Other household liquids to test, e.g., soy sauce, fruit juices, oil, honey

### What to do

#### Investigating the reaction between bicarbonate of soda and household liquids

Prepare an ice-cube tray by putting a little of each liquid you plan to test in a compartment of the ice cube tray.

Use a teaspoon to pour some bicarbonate of soda into one of the liquids in the ice cube tray. Look closely at what happens.

Repeat this with the other liquids.

#### Making a self-inflating balloon

Pour vinegar into the empty drinks bottle so that it is about one third full.

Stretch the skin of the balloon a few times by pulling it.

Using a funnel or a rolled up bit of paper like Olympia in the video, spoon bicarbonate of soda into the balloon so that the round part of the balloon is at least half full of powder.

Carefully pull the mouth of the balloon over the open end of the bottle, taking care not to spill any of the bicarbonate of soda into the vinegar.

Once the mouth of the balloon is sealed around the top of the bottle, tip the rest of the balloon up so the powder falls into the vinegar. The gas produced when the bicarbonate of soda reacts with the vinegar should inflate the balloon.

#### Being safe

If you're using liquid which can be used for cooking, your child might be tempted to taste them. It's unlikely that children will like the taste of vinegar or bicarbonate of soda, but take care to ensure your child doesn't eat too much of any of the substances you are using.

Avoid using cleaning products.



---

**Questions to ask children**

What do you think will happen when we add bicarbonate of soda to this liquid?

What do you see happening?

What do you hear happening?

When bubbles form: What do you think is inside the bubbles?

Where do you think the gas inside the bubbles is coming from?

Do the liquids that fizz with the bicarbonate of soda have anything in common?

Before inflating the balloon: what do you think will happen to the balloon when we tip the powder into the vinegar? Why?

---

**The science**

The fizzing you see when baking powder is added to some of the liquids is the result of a chemical reaction. In simple terms, this is when two (or more) substances make a new substance when they are combined.

When bicarbonate of soda reacts with substances like vinegar, one of the new things that is made is carbon dioxide gas. As this gas is produced, it makes bubbles in the liquid – this is what causes the fizzing we see and hear.

The bicarbonate of soda does not react with all liquids. The liquids it does react with have something in common. They all tend to be sour or ‘sharp’ tasting and are what scientists call acidic.

When we make the reaction take place inside the bottle with the balloon, the carbon dioxide gas is trapped. As more and more gas is produced, it starts to fill the balloon in the same way as when you blow it up with your mouth.

---



**Going further**

The reaction between bicarbonate of soda and vinegar can be used for lots of other things.

Make a bubble bomb from bicarbonate of soda and vinegar: <http://bit.ly/BubbleBomb>

Make a fire extinguisher: <http://bit.ly/FireExtIn>

Try using the reaction to fuel a fizzy bottle rocket: <http://bit.ly/FizzyRockets>

