



## Sherbet and Popping Candy

What makes sherbet fizz and what makes popping candy pop?

Stock items	Consumables
Bin bags	Citric acid
Plastic cups	Bicarbonate of soda
Plastic spoons (teaspoons, if possible)	Icing sugar
Labels and pens	Popping candy

### Presenting ideas

**Sherbet:** Invite your *edible explorer* to make their own sherbet. Make sure you have enough bicarbonate of soda, citric acid and icing sugar in clearly labelled cups before they start.

- What does sherbet taste like?
- What does it do in your mouth?
- Do you know what gas is given off?
- We're using citric acid and bicarbonate of soda – do you know anything about these ingredients?

Ask them to place 1 level spoonful of bicarbonate of soda, 1 heaped spoonful of citric acid and 3 level spoonfuls of icing sugar into a clean plastic cup. Get them to mix it very well and ask them to try some.

**Popping Candy:** Invite your *edible explorer* to try some popping candy, which you've sprinkled in the palm of their hand.

- What does it do when you put it on your tongue?
- What do you think is happening in your mouth?
- Do you know what gas is given off?
- How do you think it's made?
- Have you tried baking with it – does it work when you put it in wet mixture? If not, why not?
- Will you pop if you eat too much?

They can eat the popping candy and their DIY sherbet whilst you explain.

### What's the chemistry?

**Sherbet:** Why buy sherbet when you can make your own? It's safe to make and fun to taste.

Sherbet powder became a popular sweet in the early 19th century, initially to add to water to make drinks effervesce. These days, we get the fizzy hit by pouring



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the powder directly into our mouths; and the world just wouldn't be the same without flying saucers, sherbet lemons, sherbet fountains and Dib Dabs. It's easy to make your own sherbet using an edible acid, edible alkali and a fair amount of sugar to mask the bitterness of the citric acid and the soapiness of the bicarbonate of soda.

There are many foods (and drinks) which are acidic. We use citric acid in this case, which is roughly pH 2 and found in citrus fruits. There aren't many foods or drinks which are alkali, but bicarbonate of soda is about pH 9. A common use of bicarbonate of soda is that it makes your sponge cakes rise.

You'll need 1 level spoonful of bicarbonate of soda, one heaped spoonful of citric acid and 3 level spoonfuls of icing sugar. Give them all a really good mix, which is very important as a mouthful of citric acid isn't pleasant!

The fizzing is caused by a chemical reaction – when an acid is mixed with a carbonate, they react to form water, a salt and carbon dioxide gas, which is what you experience bursting on your tongue.



**Popping Candy:** Given that popping candy and sherbet both produce a similar experience in your mouth, you may have thought the chemistry was the same. It's the same gas, but how the bubbles are liberated in popping candy is all down to how it's made.

To make popping candy, the manufacturers firstly melt the sugar, lactose, water and colouring/flavouring mixture. Then, they blast this gooey concoction with about 600 pounds per square inch of carbon dioxide – that's about 40 times greater than atmospheric pressure! Lots of carbon dioxide gas is able to dissolve in the molten sugar mixture. The carbon dioxide is desperate to escape, just like when you open a fizzy drink, but it can't. As it cools and hardens, the mixture breaks into tiny pieces. Because the sugar has been cooling, tiny bubbles of carbon dioxide are encapsulated inside. When the sugar melts on your tongue, the bubbles of gas are released causing a popping sensation.

There's an urban myth which states if you eat lots of popping candy, followed by a hefty amount of fizzy drink, your stomach will explode. The myth became so great that General Foods, the company who patented popping candy in 1956, tried to reassure the public that this wouldn't happen and that their product had been rigorously tested. The popular television series 'Mythbusters' tried it out and the myth was busted – your stomach won't explode, although it will increase in size... and you will produce a lot of gas!

## Jo's Top Tips

Make sure you buy food-grade citric acid and bicarbonate of soda. Bicarbonate of soda is easy to get hold of on the high street. Citric acid is becoming more readily available, as it's used to alter the acidity in winemaking. However, you can buy it in bulk online and this is my preferred method.

Why not mix up the ratios? This recipe makes sherbet to my taste, but you might find it too sour. Experiment to find the optimum sherbet you enjoy.

Always make sure you know the allergy advice. I make them visible by writing allergens on chalk boards but you could print them out.

The sherbet recipe calls for plenty of sugar, so you may want to make it on a smaller scale and if you're giving it out, only do so in small amounts.

I buy popping candy from my local pound shop, where it's sold in handy little sachets; perfect for pouring a few grains into palms.



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