

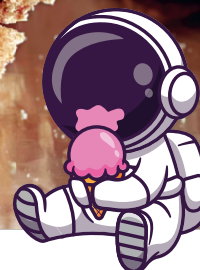
THE LAB

Three things to make and do

Kitchen chemistry

KEEP COOL

The temperature on the International Space Station is kept at around 23°C.



1 Make astronaut “ice-cream”

Blast off with a meringue taste sensation made for a space mission.

What you need

- 500g caster sugar
- 250g **egg whites**
- 1 tsp cream of tartar

- Roasting tray
- Baking parchment
- Electric whisk
- Baking tray
- Greaseproof paper
- Ice-cream scoop

Allergy warning!

Ingredients in **bold** are allergens (substances that cause allergic reactions). Learn more at tinyurl.com/SN-allergy

Instructions

- 1** Heat your oven to 200°C/180°C fan/gas 6. Put the caster sugar in a roasting tray, lined with baking parchment, and heat for five minutes.
- 2** Meanwhile, beat the egg whites with an electric whisk. Once they're stiff, add the cream of tartar. Then beat the egg whites again.
- 3** Next, add the caster sugar to the eggs, one tablespoon at a time. Continue beating the eggs with the whisk as you do so. The mixture is ready once it is stiff enough to stand up and hold its shape.
- 4** Line a baking tray with greaseproof paper. Plop scoops of the mixture onto the paper using an ice-cream scoop. This can be a bit fiddly, so you may want to get an adult to help.
- 5** Bake your meringue “ice creams” for 40–50 minutes, or until they're dry and crispy on the outside. Take out, let them cool and then enjoy.



How does it work?

Freeze-dried food is food that has had most of the moisture removed from it. It is ideal for spaceflights because it's light, easy to transport, and doesn't spill or melt in zero-gravity. Freeze-dried ice cream was developed by NASA for their Apollo missions to the Moon. Astronauts needed to add water to it before they ate it. However, most people don't have a freeze dryer at home, so in this experiment you use an oven to remove the moisture. Also, instead of a dairy-based treat, your dry “ice cream” is actually a meringue mixture. There's loads of lovely science in meringues. Whisking egg whites unravels the long protein molecules (tiny particles) that make it up. When they relink, they trap pockets of air that make the mixture light and fluffy. Sugar makes the mixture more stable. It also pulls moisture out of the egg whites, making your meringues crispy.

DAVE KELSALL - REX SHUTTERSTOCK