

Ice Crystal Crunch-Time!

Year 3 – Science

Year 5 – Science

Year 6 – Science



(Science; Yr 3, ACSSU046)

A change of state between solid and liquid can be caused by adding or removing heat

(Science; Yr 5, ACSSU077)

Solids, liquids and gases have different observable properties and behave in different ways

(Science; Yr 6, ACSSU095)

Changes to materials can be reversible or irreversible

Ice Crystal Crunch-Time!

How ice crystals form

In this activity we discover how ice crystals form in a freezing solution. It's designed to complement the knowledge gained from the resources about the science of ice creams, sorbets and freezing foods.

Equipment:

Small bowls/containers of a crunchy granita, slightly grainy sorbet, and smooth creamy ice cream. These can be desserts the students have made themselves

Provide spoons for tasting just a small spoonful per person (this is not an ice cream gorging!)

If several students are tasting from one container, ensure the 'no double dipping' rule is explained and enforced before tastings begin

Duration:

30 minutes, with optional cooking extension

Location:

The classroom or wet area, with optional cooking extension

Notes:

What to do

- 🔍 Ask students: would you eat a mouthful of crystals? Wait for their answers (It's likely someone will say "no!")
- What would it be like? (We hope someone says "crunchy"!)
- Would you eat a bowl of ice cream? Or a sorbet? ("Yes!")
- Reply: Oh, but you said you wouldn't eat crystals...

👁 Watch **The One with the Granita**



- Explain that ice cream, sorbet, gelato and granita are all desserts that take advantage of the ways cold water forms crystals.
- **Ask:** what's a water crystal called? (Ice.)
- Discuss students' experiences of frozen foods, such as gelato, ice cream and sorbet.

- Draw a line on the board and write 'Crunchy' at one end, and 'Smooth' at the other. Discuss and locate where these styles of frozen concoctions go along the line. Add any other options students want to add, such as slushies and milk shakes (ask if they've ever had a milk shake with tiny crunchy ice granules in it).



Crunchy



Smooth

- What do students think is in ice cream? (Traditional homemade ice cream only contains sugar, milk or cream, fruit/veg or flavourings, and sometimes cooked eggs.)
- Provide bowls of crushed ice cubes, crunchy granita, grainy sorbet, and smooth ice cream to TASTE (not scooping, this is tasting... make a play for scientific research here - *we're wearing labcoats, so it's science*).
- Provide students with small spoons. Get them to taste-test each one and record their observations about the **texture**. Could they detect ice crystals?
- Which item seemed to have the biggest crystals, and which the smallest? Students note their observations.

Think about this!

- 🔍 Find out how a granita is traditionally served. (In a glass, with a long spoon.)
- 🔍 Would you (could you) serve a granita in a thin, baked biscuit cone like a traditional ice cream cone? Make your case for or against.
- 🔍 Cultural traditions for serving specific foods usually match the physical properties of the food. Can you think of any other examples?

Get cooling

Watch **The One with the Green Spot Sorbet**



Resources

- ◇ From Gelato to Granita – Frozen Treats Explained: <http://hereandnow.legacy.wbur.org/2013/06/18/frozen-treats-gunst>
- ◇ Keys to Good Cooking with Harold McGee – Ice Cream: <https://youtu.be/m2H66z3gpK8>
- ◇ Making Vegetable Ice cream: <https://youtu.be/V4374vin91Y>

- Finish the class with a cooking session, making a crunchy granita and a smoother sorbet or ice cream.
- While making their frozen concoctions, students could measure the temperature of the solution at half hour intervals. Get them to record this data on a collection sheet. Think about any differences in temperature (or cooling rates) that may be caused by different variables such as ingredients and the starting temperature of the mixture.

