

Sorbet in a Bag

Year 3 – Science



(Science; Yr 3, ACSSU046)

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

Sorbet in a Bag

Using salt to lower the temperature of a brine

MYO sorbet doesn't have to involve special equipment – and it's a perfect opportunity to explore changes of state, heat transfer and how we can alter the freezing point of water using salt.

Equipment:

At least 3 large snap-lock bags and 3 smaller plastic bags that can be well sealed

Ingredients for sorbet as directed in the tips below

Access to a freezer

Posters (optional)

Juice

Ice

Salt

Towels

Duration:

45 minutes

Location:

The kitchen or classroom

Notes:

Changes of State

👁 Watch **The One with the Granita**

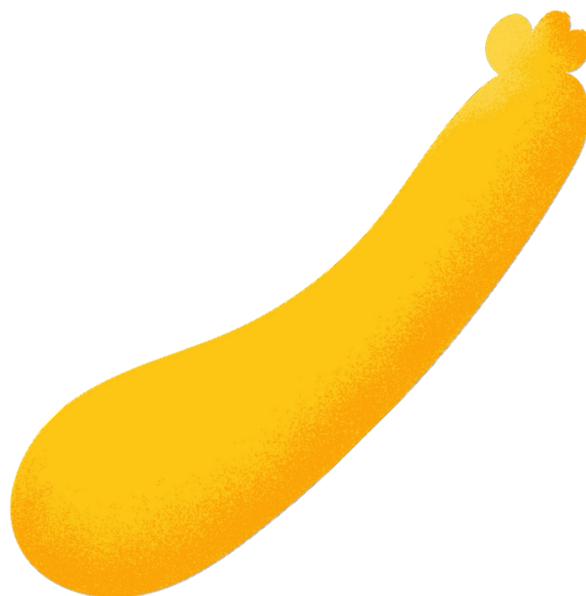


- Watch the video: Keys to Good Cooking, with Harold McGee (duration: 1:42) <https://youtu.be/m2H66z3gpK8>
- Ask students: Why do they think this works? Break down the steps and discuss why McGee might do each step.

✍ Let's be clear

Explore these science terms and concepts and create posters to display around the room:

- ◇ **Phases of matter:** What turns the liquid mixture into a solid or semi-solid?
- ◇ **Freezing point:** Why do we add salt to the ice bags? What is brine?
- ◇ **Heat transfer:** How does the thin plastic bag help us remove heat from the sorbet mixture? Would this work as well in a large block?
- ◇ **Agitation and ice crystals:** Why do we massage the sorbet mixture as it cools? (To break up large crystals and make the sorbet smoother.)
- ◇ **Reversible changes:** The mixture has changed (to a solid). How do we reverse this change? Can we separate the solution back into its constituent parts? Could we get the salt out of the water? How?



20 mins

Skills! Natural

Makes 4 shares at home (or 30 shares in class)

Carrot & Orange Sorbet in a Bag

From Alice: Plenty of cultures have their version of a frozen dessert, and this one actually originates in the Middle East where there isn't much land for raising livestock, so the "sharbat" (or what became "sorbet") is water, rather than milk based. You can make them from all sorts of ingredients, but fruit and/or vegetable sorbets are definitely my pick of the bunch!

Stuff

Chopping board and **peeler** and **grater** and **small serrated knife** and **electric juicer** and **1 large snap-lock bag** and **1 small bag**



What

6 large carrots, peeled and chopped

2 oranges, peeled and chopped

Ice

Salt

Top Tips

Salt helps to make the ice even colder, turning the bags into your very own ice-cream machine! If it seems to be taking too long, add a splash of cold water to your larger bag.

How

- Prepare all ingredients as per ingredient list.
- Set up the juicer.
- Start the juicer and press the carrots and oranges through.
- Get the bigger snap-lock bag and fill one third of the bag with 1 cup of salt and 2 cups of ice (if your bag doesn't fit as much, just remember that it's twice as much ice to salt and adjust accordingly).
- Half-fill your small bag with juice and add a tablespoon of ice (crushing it will help speed up the process).
- Put the smaller bag into the larger one and shake the whole thing together until a slushie forms and serve (about 3 mins).

