

# Making ice cream without a freezer

You can freeze an ice cream mixture using ice and salt rather than a freezer.

## You will need:

- 1 tablespoon sugar
- 120 ml milk, 120 ml double cream
- ¼ teaspoon vanilla extract
- About 1 kg ice cubes
- 7 tablespoons salt (see below)
- 2 re-sealable food bags (e.g. zip-lock)
- Towel
- Bowl or large jug
- Whisk

(The salt with big crystals used in salt grinders is best; if you use normal table salt add another couple of spoonsful.)

## What you do

Whisk the milk, cream, sugar and vanilla in a bowl or large jug. Pour the mixture into one of the re-sealable bags and set it aside.

Put some of the ice and the salt into the second bag. Put the sealed bag with the ice cream mixture inside the ice bag and then add more ice and salt. The ice cream mixture should be sealed in its bag and not get in contact with the salt.

Wrap this bag in a towel and shake until the cream mixture has frozen. This will probably take about 10 minutes. Eat it straight away.

## How it works

Ice has to absorb heat energy in order to melt and change from a solid to a liquid – it is an endothermic process. If you hold ice, you can feel your hand get cold as the ice absorbs heat from your hand. In the same way, the heat from the ice cream mix is absorbed by the ice and so it cools and freezes.

When you add salt to the ice, it lowers the freezing point of the ice, so even more energy has to be absorbed from the environment (and the ice cream mix) in order for the ice to melt. This makes the ice colder than it was before, which is how your ice cream freezes. You use large salt crystals as they take more time to dissolve in the water around the ice, which allows for even more cooling of the ice cream.

*Vicky Wong is Chemistry editor of Catalyst.*



*Whisk the ice cream mix and place inside a bag. Place this bag in a second bag filled with ice and salt.*



*The ingredients*



*Ice cream mix in a bag*



*Ready to eat*

## Look here!

Ice cream can be made even faster using liquid nitrogen, which is at  $-196^{\circ}\text{C}$ . Look here to see the chef Heston Blumenthal and a record breaking litre of ice cream: <http://tinyurl.com/q6bvxfb>