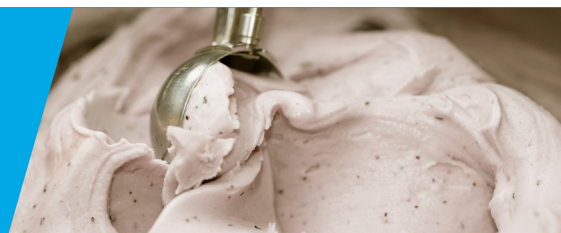


# CURIOSITY AT HOME

## ICE CREAM IN A BAG



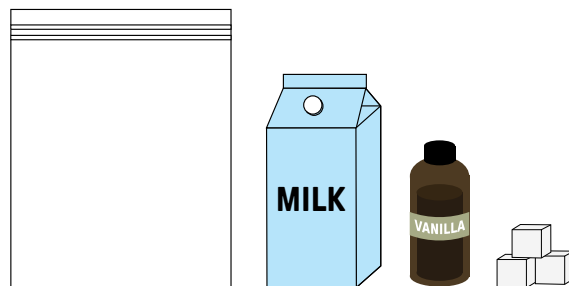
*Grab some plastic bags, combine some ingredients, and shake it up! Try out a little chemistry in the kitchen and turn liquids into solids in a tasty experiment.*

### MATERIALS

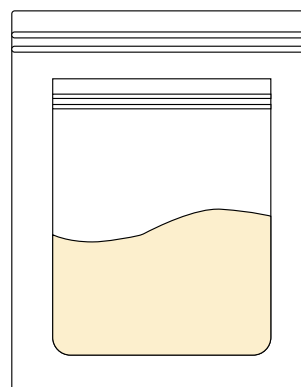
- ½ Cup Milk (Can be dairy or dairy-free. Higher fat milks work better.)
- ½ Teaspoon Vanilla extract
- 1 Tablespoon Sugar
- 4 Cups Ice
- 4 Tablespoons Rock salt
- 3 Ziploc bags (2-quart size bags and 1-gallon size bag)
- Gloves or a towel (If desired, to keep hands warm)
- Bowls and spoon to eat ice cream with when finished!
- Science notebook or paper
- Something to write with

### PROCEDURE

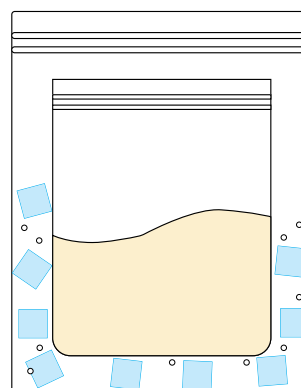
- Start by gathering your ingredients.
- Mix the milk, vanilla, and sugar together in one of the quart size bags. Seal tightly! Allow as little air to remain in the bag as possible. Too much air in the bag may cause the bag to open while shaking, which could create a big mess.
- Place the filled Ziploc bag into the other quart size bag. This extra bag is used just in case the other leaks or comes open.
- Then place your double-bagged mixture into the gallon sized bag.
- Fill the gallon bag with ice and sprinkle the rock salt on top.
- Squeeze out as much of the air as you can. Seal the gallon bag.
- Make sure the ice surrounds the ice cream mixture and shake for 5-8 minutes.



Mix the milk, vanilla and sugar together in bag.



Put doubled-up quart bags into gallon sized bag.



Fill gallon bag with ice and sprinkle the rock salt on top.



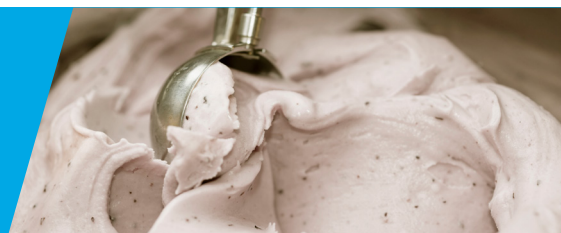
Show us how you're being curious! Share your results with us.

PACIFIC  
SCIENCE  
CENTER

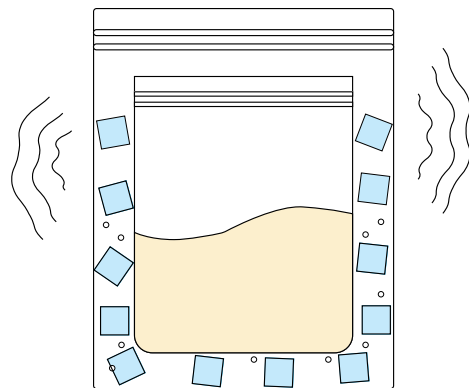


# CURIOSITY AT HOME

## ICE CREAM IN A BAG



- If your hands are cold, use gloves or a towel. Alternatively, you can roll your bag across a kitchen countertop or table.
- After you've shaken the mixture for 5-8 minutes, you should notice that the ice cream has started to firm up. If not, feel free to keep shaking it for a bit.
- When you're ready, open up the bags, scoop the ice cream into your bowls, and enjoy!



Make sure ice surrounds the ice cream mixture and shake for 5-8 minutes

### WHAT'S HAPPENING?

To create the creamy texture of ice cream, ingredients need to be quickly cooled. Adding ice helps, but salt and chemistry can make things even colder - faster! Liquids have a freezing point or temperature that when reached causes molecules to join together, phase changing into a solid. Pure liquid water has a freezing point of 32 degrees Fahrenheit, this is when solid ice forms. When salt is dissolved into water, the added particles get in the way of water molecules trying to combine. This lowers the freezing point, allowing the salt-water solution to get even colder than pure water ice cubes.



Adding salt to icy roads helps the ice melt.



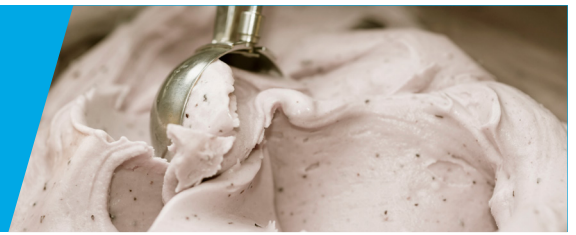
Show us how you're being curious! Share your results with us.

PACIFIC  
SCIENCE  
CENTER



# CURIOSITY AT HOME

## ICE CREAM IN A BAG



### 6–8 GRADE EXPLORATION

Explore the following questions and write your observations in your science notebook.

- Draw a diagram showing how heat moved from one place to another when you made ice cream.
- We added salt to melt the ice because cold water is better at conducting heat than ice of the same temperature is. Can you think of any other times when you might want a material that's good at conducting heat?
- Temperature is a measure of the thermal energy in a system. In other words, how fast the molecules are moving around. Are the molecules of milk and sugar in the ice cream moving faster at the beginning or end of the experiment?
- Cookies are very different from ice cream. How do you think salt could assist a cookie recipe?
- What are some other ingredients you'd like to try in ice cream?
- Make another batch of ice cream, but make a recipe modification. For example, change the amount of milk or amount of sugar, or try using another type of milk. Keep track of the changes you made to the recipe in your science notebook and which one tastes best and has the best texture.
- Food chemists have to consider what interactions different ingredients have when mixed or cooked together. How do you think chemistry played a role in the ice cream recipe you made? Take a look at the ingredients list on some packaged food. What purpose do you think each of those ingredients has in this food item? Are there any you're unfamiliar with?



Show us how you're being curious! Share your results with us.

PACIFIC  
SCIENCE  
CENTER

