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 by doing this recipe that turns liquids into solids in a tasty experiment.

MATERIALS
- Milk (½ cup, can be dairy or dairy-free)
- Vanilla extract (½ tsp)
- Sugar (1 Tbsp)
- Ice (4 cups)
- Rock salt (4 Tbsp)
- Ziploc bags (2-quart size bags and 1-gallon size bag)
- Bowls and spoon to eat ice cream with when finished!
- Science notebook or paper
- Something to write with
- **Optional:** 1 pair disposable gloves

PROCEDURE
- Gather 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 then sprinkle the rock salt on top.
- Release all of the air and then seal the gallon bag.

Experiment continued on next page...
PROCEDURE continued...

• Make sure the ice surrounds the ice cream mixture and shake for 5–8 minutes.
• If your hands are cold, use the gloves or a towel! You may alternatively want to 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, dish up the ice cream, and chow down!

DID YOU KNOW?

While it wasn’t included in the materials list, air is a very important ingredient in ice cream. It makes up 30% to 50% of the total volume of most ice cream. Air affects the shape, texture, and even taste!

What does the salt do? Just like we use salt on icy roads in the winter, salt causes the ice to melt. When salt comes into contact with ice, the freezing point of the ice is lowered. Water will normally freeze at 32 degrees Fahrenheit. A 10% salt solution freezes at 20 degrees Fahrenheit, and a 20% solution freezes at 2 degrees Fahrenheit. By lowering the temperature at which ice is frozen, we are able to create an environment in which the milk mixture can freeze at a temperature below 32 degrees Fahrenheit into ice cream.
6–8 GRADE EXPLORATION

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

- What role do you think salt played in this recipe?
- Can you taste the salt? Why or why not?
- 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 more batches of ice cream, however change the amount of milk or amount of sugar. Try using another type of milk or a mix of different types. Keep track of the changes you made to the recipe in your science notebook and which taste best and have 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 that you might have at home. What purpose do you think each of those ingredients has in this food item? Are there any you’re unfamiliar with?