

Ice Cream in a Bag

Materials

- Measuring spoons
- Measuring cup
- Sugar
- Half-and-half
Alternatively, you can use milk, heavy whipping cream or alternative milk.
- Vanilla extract
- Salt
Different types of salts, such as table salt or rock salt, will all work, but may give slightly different results.
- Ice cubes (8 cups)
- Pint or sandwich-sized sealable bags (2)
- Gallon-sized sealable bags (2)
- Oven mitts or small towel
- Timer or clock

Procedure



1. In each small, sealable bag, place 1 tablespoon sugar, 1/2 cup milk and 1/4 teaspoon vanilla extract. Seal both bags well.
2. Experiment 1: Use Salt (use 1st small bag & 1st gallon-sized bag):
 - Add 4 cups ice cubes to one of the large, gallon-sized bags.
 - Add 1/2 cup salt to the large, gallon-sized bag containing ice.
 - Place one of the small bags into the large bag with ice cubes. Be sure both bags are sealed.
 - After putting on oven mitts or wrapping the bag in a small towel, shake the bag for 5 minutes. Feel the small bag every couple of minutes while you shake it. Observe what happens to the smaller bag as you shake it.
3. Experiment 2: No Salt (use 2nd small bag & 2nd gallon-sized bag):
 - Add 4 cups of ice cubes to other large, gallon-sized bag. This time, do not add any salt.
 - Place the other small bag prepared in step 1 in the large bag. Be sure both bags are sealed
 - After putting on oven mitts or wrapping the bag in a small towel, shake the bag for 5 minutes. Feel the small bag every couple of minutes while you shake it. Observe what happens to the smaller bag as you shake it.
4. One of these methods made ice cream to enjoy. Which one?

Things to Observe

- How cold does the ice cube bag from with salt feel in comparison to the bag without salt?
- What happens to the both bags over time? What happens to the ice cubes? How do they look at the end?
- How did adding salt make a difference?

How Does it Work?



Salt lowers the freezing point of water. Adding salt to ice will melt faster than pure ice.

Freezing temp of pure H₂O: 0°C (32°F)

Freezing temp of H₂O + salt: < 0°C

The ice cream bag using salt should have hardened quickly and turned into ice cream.

The ice cream bag without salt should remain liquid. You can turn this into ice cream by placing in a larger bag with salt and ice!

Fun Fact: This is why we add salt to icy roads to melt the ice.