

Classroom Chemistry – Ice Cream in a Bag

Cooking food involves chemistry but so does cooling food. Today we'll learn how to make ice cream in a bag.

Materials: 125 ml = ½ cup

- 125 ml milk
- 1.25 ml vanilla flavouring
- Very large (1 litre) zip locking plastic bag
- 125 ml whipping cream
- 125 ml table salt
- Measuring cups & spoons
- Medium (500 ml) zip locking plastic bag
- 60 ml sugar
- Water
- 2 cups of ice cubes
- Thermometer
- Cloth towel



Procedure: (Remember to have your parent's permission and have them watch and help you.)

- Add the sugar, milk, whipping cream, and vanilla to the medium sized zip locking bag. Seal the bag (check for leaks).
- Put 2 cups of ice into the large zip locking bag.
- Use a thermometer to measure and record the temperature of the ice in the large bag.
- Add the salt (NaCl) to the bag of ice.
- Place the medium sealed bag inside the large bag of ice and salt. Seal the gallon bag securely.
- Gently rock the large bag from side to side. Use a towel because it gets very cold and hold it by the top seal.
- Rock the bag for 10-15 minutes. As the ice melts the contents of the smaller inside bag solidifies into ice cream.
- Open the large bag and use the thermometer to measure and record the temperature of the ice/salt mixture. Water turns to ice at zero degrees. What is the temperature of your ice/salt mixture?
- Remove the inner bag, open it, and ENJOY!

What's happening?

Ice has to absorb energy to melt. 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 inner bag (and hands) to melt the ice. This makes the ice colder than zero degrees which freezes your ice cream.

The salt lowers the point at which water will re-freeze into ice but you can't add salt to very cold ice and expect it to melt because water has to be present! This is why NaCl isn't used to de-ice sidewalks on very cold days.

Extension:

You could use other types of salt, but not sugar because among other reasons sugar doesn't dissolve well in cold water. Salt dissolved in water causes a greater the disruption to properties like freezing point depression, boiling point elevation and osmotic pressure.

This activity is based on our "Classroom Chemistry" kit that is currently under development. The source for this lab is: <http://easyscienceexperiments.co.uk/make-ice-cream>. Our teaching kits (described on our website) are loaned out FREE to provide classroom teachers and parents of home schooled children an opportunity to explore Science in interesting ways. Please consider volunteering as a classroom speaker or allow your business as a field trip location.

Lorne Cooper, Regional Executive Director

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