

# Blizzards (the ice cream kind)

## 4<sup>th</sup> Grade

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### References:

- Mary Allison's ice cream lesson
- <http://www.science-house.org/learn/CountertopChem/exp15.html>
- <http://chemistry.about.com/cs/howtos/a/aa020404a.htm>

### Benchmarks:

- SLC/GLI #: PS-1

### Objectives:

In this lesson, students will describe physical properties of ingredients used to make ice cream. Students will use beakers and graduated cylinders to make volume measurements. Students will record their observations in their science journal. In this experiment, they will use the lowered freezing point of water to chill another mixture (ice cream) to the solid state.

### Materials:

- Various kinds of candy to put in blizzards: M&M's, Kit Kat's, Butterfingers, etc
- 1 quart plastic bag
- 1 gallon plastic bag
- 1/2 cup (125 mL) Half and Half
- 1/2 cup (125 mL) whipping cream
- 1/4 cup (62.5 mL) sugar
- 1/4 teaspoon (1.25 mL) vanilla flavoring
- sodium chloride, or rock salt
- ice
- thermometer
- measuring cups (1, 1/2, and 1/4 cups)
- Styrofoam cups
- plastic spoons

Makes about 3-5 small servings

### Initial Demonstration:

Students will identify the states of matter of the materials. They should recognize solids and liquids. Tell them they will be mixing the ingredients to make ice cream. Ask them if they think a physical or chemical change might occur. Describe what effect ice will have on the ingredients and their temperature.

### Target Observations:

- Identify states of matter: solid, liquid, and gas
- Describe physical properties of states
- Melting ice is a physical change

- Salt dissolves in ice water, does not melt

**Target Model:**

A physical change requires a change in the size, shape of the object, or state of matter. Ice is water in its solid state of matter, but changes states (into a liquid) when it melts. When salt is added to an ice water mixture, the salt dissolves into the water instead of disappearing. The mixture becomes salt water.

**Procedure :**

1. Place 1/4 cup sugar, 1/2 cup milk, 1/2 cup whipping cream, and 1/4 teaspoon vanilla into a one-quart plastic bag
2. Securely seal the bag and mix well
3. Place 2 cups of ice into a one-gallon plastic bag
4. Using the thermometer, measure and record in your journal the ice temperature
5. Add between 1/2 and 3/4 cups of sodium chloride to the gallon bag
6. Place the sealed quart bag into the gallon bag. Close the larger bag securely.
7. Holding the large bag by the top seal, gently rock the bag from side to side. Do not hold the bag in your hands—it will be cold enough to cause tissue damage to your hands
8. Continue rocking the bag until the contents of the quart bag have solidified (10-15 minutes)
9. Measure the temperature of the salt/ice mixture in the gallon bag and record the temperature
10. Remove the frozen contents from quart bag into Styrofoam™ cups. Consume the contents of the cups

**Data and Observations**

Initial temperature of ice \_\_\_\_\_

Final temperature of ice mixture \_\_\_\_\_

Change in temperature \_\_\_\_\_

**Summary:**

Combining cream, milk, and sugar is a physical change that makes ice cream. The mixture changes state into a solid. The physical change occurs when ice is used to lower the temperature of the ice cream's ingredients.