I Scream, You Scream…We All Scream for Ice Cream!

Lesson Concept Salts are compounds made of metals and nonmetals. They have properties such as hardness, brittleness, high melting point, and solubility in water.

Link In previous lesson students learned about compounds.

Time 1 hour 30 minutes

Materials

Whole Group

Document camera

Per Group (groups of 2-4)

10 heavy duty gallon Ziploc™ bags

10 heavy duty quart size Ziploc™ bags

1 measuring cup

1 measuring Tablespoon

240 mL (1 cup) whole milk

45 mL (3 T) sugar

15 mL chocolate syrup

90 mL (6 T) rock salt

720 mL (2-3 cups) ice (enough to fill the gallon bag)

1 thermometer

1 timer

Individual

Ice Cream Lab paper

Science notebook

Pencil

1 spoon and 1 cup for each student to eat ice cream

Advance Preparation

1. Prepare ice cream supplies in enough groups for the entire class.
2. Fill heavy duty Ziploc™ bags with ice.

Procedure:

Engage ***(15-20 minutes) Salts are compounds made of metals and nonmetals. They have properties such as hardness, brittleness, high melting point, and solubility in water.***

1. Distribute Ice Cream Lab Paper. Ask students "What do you know about salt?" Have students individually record what they know on their lab sheets. After about 2 minutes, have students share out loud and teacher records on circle chart.
2. Review previous lesson 5.11 highlighting students' knowledge of compounds and their properties.
3. Discuss how salt is made of a metal and a nonmetal (NaCl).
4. Discuss salt properties: hardness, brittleness, high melting points, and solubility in water. You may demonstrate brittleness by breaking a piece of rock salt. You may also demonstrate solubility by mixing salt with water.
5. Introduce Lab: "Did you know that you need salt to make ice cream?!"

Explore ***(45 minutes) Salts are compounds made of metals and nonmetals. They have properties such as hardness, brittleness, high melting point, and solubility in water.***

6. Have students use a quart size Ziploc™ bag to mix milk, chocolate syrup, and sugar.
7. Have students seal the bag very tightly.
8. Have students use a gallon bag to mix ice and rock salt, leaving room for the quart size bag.
9. Have students place quart size bag with milk mixture inside of the gallon size bag and seal.
10. Have each student hold the bag at the top corners (to prevent cold, wet hands) and turn the bag 20 times. Have other students record observations on lab sheet including temperature and state of matter. After 20 turns, have the next student turn the bag. Explain to students that they will continue turning the bag until the liquid mixture becomes a solid. This should take approximately 10 minutes.
11. Once all students are finished, students may open bag and distribute ice cream evenly into cups for consumption.
12. Call students back to desks for discussion questions.

Explain ***(15 minutes) Salts are compounds made of metals and nonmetals. They have properties such as hardness, brittleness, high melting point, and solubility in water.***

13. Discuss students' observations including temperature and changes in states of matter.

14. Ask students, “What was the role of the salt?” 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 environment in order for the ice to melt. This makes the ice colder than it was before, which is how your ice cream freezes.

Extend ***(5-10 minutes) Salts are compounds made of metals and nonmetals. They have properties such as hardness, brittleness, high melting point, and solubility in water.***

15. Ask the students, “Why do you think people in colder climates use salt on icy roads? Why is black ice dangerous? See picture below.

Evaluate **(15-20 minutes) know the common properties of salts, such as sodium chloride (NaCl)**

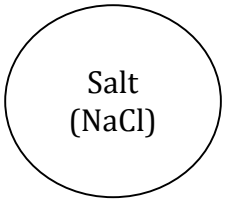
16. Name at least two properties of salt. How do you know these are properties of salt?
17. Describe the process we used to make ice cream. What states of matter did you observe?

Name: _____

Ice Cream Lab Paper

1. What do you know about salt?

Circle Chart:



2. Lab Data

Turns	Temperature	Ice (State of Matter)	Milk (State of Matter)
1-20			
21-40			
41-60			
61-80			
81-100			
101-120			
121-140			
141-160			
161-180			
181-200			

3. Post Lab Questions:

1. Name at least two properties of salt. How do you know these are properties of salt? _____

2. Describe the process we used to make ice cream. What changes in the states of matter did you observe? _____