

What Matters??

Ice Cream

1. Eureka! Molecules in Solids!

Introduction:

- Believe it or not, the simple process of making ice cream involves chemistry!
- Today, you will be making your own ice cream, while toying around with these basic scientific principles.
- And yes... you can eat the ice cream!

History of Ice Cream:

- The origin of ice cream is unknown, though most suspect it was originally discovered by the Roman emperor, Nero.
- Runners would carry snow and ice from the mountains and he would coat it with fruit and sweet toppings.
- Others believe ice cream was invented in China and brought to the US and Europe by Marco Polo.

History of Ice Cream:

- It has been changed and modified over the years, with many different recipes and ice cream parlors opening up.
- It is rumored that George Washington once paid \$200 (a whole lotta money back then) for a secret ice cream recipe.
- In 1846, Nancy Johnson developed and patented the first hand-crank ice cream maker.
- Eventually, ice cream became commercialized and many new stores and entrepreneurs took advantage of its popularity.

Background Information:

- Remember what we learned about changing states. Freezing is the change of state when a liquid turns into a solid.
- Often, a liquid turns into a crystalline solid. In a crystalline solid, the particles are arranged in an orderly fashion.
- Salt is also called Sodium Chloride, or NaCl. This is because it is made up of 1 sodium atom and 1 chloride atom.
- When you add salt to ice, something interesting happens. You will be exploring this idea today.

Purpose:

- After completing this lab, every student will be able to explain the concept of state changes.
- Also, every student will be able to describe the effects of adding salt to water.

Materials

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| Zip Lock Bags: | Ice Cream Mixture |
| <ul style="list-style-type: none">▪ 1 gallon-size▪ 1 quart-size▪ 1 sandwich-size | <ul style="list-style-type: none">• 1 tablespoon of sugar• 1/2 teaspoon of vanilla• 1/2 cup of whole milk |
| <ul style="list-style-type: none">▪ 2 cups of ice▪ 6 tablespoons of rock salt (NaCl) | |

Hypothesis:

- Predict what may happen after
- 1 min
- 5 min
- 10 min

Lab Directions:

In the smaller baggie:

- Mix the milk, the sugar and vanilla
- Seal this baggie **TIGHT!**
- And then put it into the quart bag

Lab Directions:

In the large baggie:

- Put **ONLY** the salt and the ice

Lab Directions:

- Place the sealed smaller baggie into the quart baggie then put these into the 1 gallon ice & salt bag.
- Seal the 1 gallon ice & salt bag.
- Roll the baggies, back and forth over and over until the milk-sugar-vanilla mixture becomes hardened.

- Record your ice cream observations at:

1-5-10 minutes

- Record the temperature in the ice bag :
- Before rock salt
- After rock salt
- Change (Before minus After)

After the 10 minutes of rolling

- Pull out the quart bag which holds the smaller milk, etc bag & wipe off on the towel.
- Pull out the sandwich bag and record your observations...
- THEN ...Enjoy your results!
- Complete your lab analysis questions & conclusion sentences