

**Title of lesson:** I Scream, You Scream, We all Scream for Ice Cream Science!

**Grade level(s):** Fourth through sixth

**NJ Core Curriculum Content Standard:**

5.6 Physical Science-Chemistry A3 Recognize that water, as an example of matter, can exist as a solid, liquid or gas and can be transformed from one state to another by heating or cooling.

5.6 Physical Science-Chemistry A4 Measure characteristic physical properties such as boiling point, melting point, and solubility, and recognize that the property is independent of the amount of sample.

**Length:** 15-20 minutes

**Objective:** The students will be able to understand the basic physical reaction involved in making ice cream.

**Materials:**

- \*This recipe is for each group:
  - 1 pre-measured quart-sized Zip-loc bag with:
    - ½ cup milk
    - 2 teaspoons of sugar
    - 2 drops of vanilla flavoring
  - 4 cups of ice
  - 5oz, 7oz, or 10oz of salt
  - 1 gallon-size Zip-loc freezer bag
  - a towel to keep fingers from freezing
- \*Chart to track estimated and real freeze times
- \*Markers: permanent and dry-erase
- \*Spoons

**Procedures:**

**Introduction:**

- First I will see what they know about ice cream by asking them a few questions:
- \*What do you know about ice cream?
  - \*How does homemade ice cream become frozen without using a freezer?
  - \*What do you know about salt and ice when they are together?
- (I will write their ideas on the board)

**Development:**

- \* I will tell the class that we are going to test why salt is crucial to ice cream making.
- \* I will break the class into three groups and assign them group numbers.
- \* I will pass out the pre-measured bags of ice cream mix, salt, bags of ice, towels, and directions on how to make ice cream.
- \* I will tell the class that each group has a different amount of salt, have each group guess how long they think it will take for their ice cream to freeze, and record them on the chart.
- \* I will choose a student to read the directions to the class and I will ask if there are any questions before we begin.
- \* Their directions are:
  1. Open your bag of ice and pour the salt on the ice.
  2. Put your small bag of ice cream mix in the large bag.
  3. Completely seal the large bag.
  4. Wrap the large bag with a towel.
  5. Take turns shaking your bag very fast.
  6. Check every couple of minutes to see whether your ice cream is frozen. When it is, call out "Ice cream!"
  7. Open the large bag and take the bag of ice cream out and dispose of the big bag.
  8. Enjoy your ice cream and look at the information on the chart from the other groups. Which teams' ice cream froze fastest? Slowest? Why?Your teacher will lead a discussion about ice and salt and how they work together to freeze.

**Closure:** After the groups had time to think about why one group's ice cream froze fastest or slowest, I will ask them to share their ideas with the class. Then I will explain the science behind the salt and ice combination and how it helped to freeze the ice cream.

**Assessment:** I will ask the class what they learned about making ice cream and why salt is important when making it.



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