



Ice Cream in a Bag

Today, we will be having fun, eating ice cream, and learning about how salt is used to lower the melting point of ice. This project actually makes lots of ice cream – definitely enough for a group of three or four. Since the project only takes about 20 minutes total, it would be best to have larger groups and make two batches of ice cream. Then, the teams will share each batch of the ice cream.

Material List

- 1/2 cup milk
- 1/2 cup whipping cream (heavy cream)
- 1/4 cup sugar
- 1/4 teaspoon vanilla
- 1/2 to 3/4 cup rock salt
- 2 cups ice
- 1-quart Ziploc bag *The Ziploc Easy Zipper bags hold their seal the best*
- 1-gallon Ziploc bag
- measuring cups/spoons
- cups and spoons for eating!

Procedure:

1. Add 1/4 cup sugar, 1/2 cup milk, 1/2 cup whipping cream, and 1/4 teaspoon vanilla to the quart Ziploc bag. Seal the bag securely.
2. Put 2 cups of ice into the gallon Ziploc bag.
3. Add 1/2 to 3/4 cup rock salt to the bag of ice.
4. Place the sealed quart bag inside the gallon bag of ice and salt. Seal the gallon bag securely.
5. Gently rock the gallon bag from side to side. It is best to hold it by the top seal or to have gloves or a cloth between the bag and your hands because the bag will be cold enough to damage your skin. Pass it to your partner or mentor if it gets too cold.
WARNING: This bag gets really COLD!
6. Continue to rock the bag for 10-15 minutes or until the contents of the quart bag have solidified into ice cream.
7. Remove the quart bag, open it, serve the contents into cups with spoons and ENJOY!

Engineering Relation:

When combined with salt, water's freezing point is lowered below the everyday 32° Fahrenheit. With the temperature in the outer gallon-size bag a few degrees colder, the water-based milk and cream from the inside bag are then cooled to 32 degrees and below, therefore freezing the contents. The higher the salinity (salt concentration) of water, the lower the freezing temperature will be.

How can we use our knowledge of salt and freezing temperature in the real world?

Answer: In situations where unwanted ice is present, such as on roads and sidewalks in the winter. This is why you see salt on sleety roads (roads with thin layers of ice). Even if the saltwater concentration lowered the freezing temperature, the salt will not prevent the water from freezing if the winter temperature is less than that.