Coffee Creamer Ice Cream

Background
The melting and freezing point of water is 0°C. When you add a substance to the water it will change the melting, freezing, and boiling point.

Pre-lab Questions
1. Did you know that people put salt on icy roads to help melt the ice? Why does that work?

2. Why don’t the oceans freeze?

Objective
In this experiment, you will investigate how dissolving chemicals in water changes the freezing point of a solution.

Materials
- Liquid Non-Dairy Creamer
- Empty Wide Mouthed Bottle With Lid
- Water
- Sodium Chloride (salt),
- Ice
- Thermometer

Safety
- Safety goggles should be worn during this activity
- Do not drink the salt water solution
- Wash your hands thoroughly before leaving the lab.
- When you complete the activity, dispose of the salt water into a sink.

Procedure
1. Place your creamer cup in the bottle.
2. Fill your bottle or bag ½ full with ice.
3. Pour the ¼ cup of sodium chloride (salt) into your bottle.
4. Fill the bottle with ice.
5. Add water about ½ full.
6. Measure the temperature of the mixture in your bottle.
7. Record the temperature in your data table below.
8. Place the lid on your container.
9. Shake your bottle for 1 minute to mix everything together.
10. Measure the temperature again and record in your data table.
11. Shake your bottle for 3 minutes.
12. Measure the temperature again and record in your data table.
13. Shake for another 2 minutes.
14. Measure the temperature again and record in your data table.
15. Remove the creamer and, without opening it, check for firmness either by
squeezing the sides or shaking the cup near your ear. If you feel or hear liquid sloshing, place the creamer back in the bottle for 2 more minutes.

16. Open and enjoy!

### Data

<table>
<thead>
<tr>
<th></th>
<th>Temperature After 1 minute (°C)</th>
<th>Temperature After 4 minutes (°C)</th>
<th>Temperature After 6 minutes (°C)</th>
<th>Total Temperature change (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting Temperature (°C)</td>
<td></td>
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### Calculations

How much did the temperature change during this experiment? Subtract your final temperature from your starting temperature.

### Analysis

1. What happened to your creamer cup when you added the salt and ice to your bottle/bag?

2. Why did this happen?

### Conclusion

Write a few sentences summarizing what you learned from this activity.

- What did you like the best? Why?
- What did you not like? Why?