

Ice Cream Lab

FREEZING POINT DEPRESSION OF WATER

OBJECTIVE: Students will understand the effect of rock salt in depressing the freezing point of water, demonstrated by the freezing of the ice cream.

MATERIALS:

- 1/2 c whipping cream
- 1/2 c milk
- 1/4 c sugar
- 1/4 tsp vanilla
- 1 large and 1 small Ziploc bag
- Ice
- Rock salt
- Towel

PROCEDURE:

1. Mix all the ingredients into the small Ziploc bag. **SEAL WELL.**
2. Place alternating layers of ice and rock salt into the large Ziploc bag. Place the small bag into the center of the ice and salt. **SEAL WELL.** Place baggies at one end of the towel and then roll the towel up.
3. Roll the towel back and forth until the ice cream is frozen.
4. When frozen, remove the ice cream baggie. The ice cream may be consumed.



Discussion Questions

1. What happened shortly after you added the salt to the ice cubes? Was the temperature above or below the freezing temperature for water?
2. What is the only factor that could have caused the changes shown in question 1? What does this tell you about the freezing point temperature of salt water compared to fresh water?
3. Heat energy is needed to change phase from a solid to a liquid. List the possible sources of the heat needed for this phase change in your baggie. Which source do you think is the best possibility and why?
4. Explain how the energy flow of the baggie system resulted in your tasty treat for an end product. Where is the energy flowing from and where is it going to?
5. In the radiator of your car you put a combination of antifreeze and water to keep your car engine cool in the summer and prevent the radiator from freezing in the winter. Explain how you think this works in terms of what you saw in the experiment you just did.