

Investigation Three: What happens when salt water freezes?

Extension Activity:

Why do salt water and fresh water freeze differently?

In winter, in places where it snows, sidewalks and front steps can become slippery when they are covered with ice. In order to prevent accidents, many people spread salt on steps and walks. This melts the ice. Why do you think this works?

Materials

- Fresh water solution from Looking Closer, *What happens when salt water freezes?*
- Salt water solution from Looking Closer, *What happens when salt water freezes?*
- thermometer

Procedure and Record Sheet

1. Use a thermometer to check the temperature of both solutions. Record the temperatures in the table below.

Temperature of salt water before freezing	
Temperature of fresh water before freezing	
Temperature of freezer compartment	

2. Record the temperature of the freezer in the table above, then place both bottles in the freezer for 12-24 hours.
3. If you can, examine the bottles every hour or so as they freeze. **Do not leave glass thermometers in the bottles of water in the freezer.** Record the temperature of the solutions along with your observations. You can graph on paper or use the online graphing tool.
4. Your teacher will give you a frozen fresh water bottle and a frozen salt water bottle. Look carefully at both.

Think about it Questions

1. *What differences do you see between the fresh water ice core and the salt water ice core? Be as specific as possible.*

2. *Consider the temperature readings recorded in your table above. Did both bottles start at the same temperature? Did the two ice cores stay in the freezer for the same amount of time? If both your answers are "yes", then how do you explain the differences in the ways the fresh water and salt water freeze?*