Freezing Point Depression Lab

Background: Pure water freezes at 0◦ C at sea level. Below 0◦C, pure water cannot exist as a liquid, but rather as a solid. Adding impurities (anything dissolved in water) can depress its freezing/melting point. This means that water can then still be liquid at temperatures less than 0◦ C. We call this **freezing point depression**.

Purpose: Investigate how impurities (e.g. salt) in water affect its freezing/melting point

Hypothesis: If salt is added to ice mixture, temperature (freezing point depression) will then drop, and ice cream will be frozen more rapidly.

Materials:

Whole Milk	½ and ½	sugar
Salt	vanilla	whipping cream
Toppings	bowls	spoons
Thermometers	napkins	qt./gal. zip lock bags
Rock salt		

Procedure: See overhead

Observations and Questions:

1. Once you've got ice cream, measure the temperature of the salt water in the bottom of the ziploc. Record it here: _____°C.

2. How does this temperature compare to the freezing point of pure water?

3. What was the solution(s) in this lab? _____
   What was the solvent? _____ What was the solute? _____

4. Do you think we could have made ice cream just as well in pure ice water? Why or why not?

5. Based on your answer to the last question, why do you think we added salt to the ice?

6. Why do you think they sprinkle salt on icy roads near the ski resorts at Lake Tahoe?

$C_6H_{12}O_6$

7. One form of sugar (glucose) has a chemical formula of C6H12O6. How many carbon atoms are there in glucose? _____ hydrogen atoms? _____ oxygen atoms?