Ice: The Hard Facts! 1 OF 2

When water freezes, the water molecules arrange themselves in a special way to form ice crystals. The crystals repeat themselves over and over again to form a nice hard piece of ice. But what happens if water has something dissolved in it already like salt or sugar? Let's do an experiment to find out!

Materials:

- Water
- 3 clear plastic cups
- Salt
- Sugar
- Tablespoon
- Masking tape
- Pen
- Popsicle stick

Procedures:

1. Use your masking tape and a pen to label your three cups fresh, salt, and sugar. Add about ¼ cup of water to each cup. Do not add anything to the cup marked "fresh".

2. Add 1 tablespoon of salt and 1 tablespoon of sugar to their labeled cups. Stir until no more salt or sugar will dissolve.

3. Make a prediction about which liquid you think will freeze first. How about which one you think will freeze the hardest? Why do you think that?

4. Carefully place the three cups in the freezer where they will not spill. Allow the cups to stay undisturbed in the freezer overnight.

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5. The next day, take the cups out of the freezer and observe the ice in each cup. Does all the ice look the same?

6. Try scraping or poking the ice with a Popsicle stick. What do you notice?

Think about this …

Have you ever noticed how a Popsicle is frozen but it is easier to bite than an ice cube? Based on the activity you just did, what do you think is one of the main ingredients in Popsicles that make them pretty easy to bite even when they are frozen?

Where's the Chemistry?

Water molecules arrange themselves in an orderly pattern when they freeze. But when salt or sugar is dissolved into the water, these substances interfere with the regular ice crystal structure. This makes it take longer for the liquid to freeze and can make the frozen liquid less hard once it does freeze.