

Igloo of Salt

Standards:

CCSS.ELA-Literacy.RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CCSS.ELA-Literacy.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CCSS.ELA-Literacy.RI.7.9 Analyze how two or more authors writing about the same topic shape their presentations of key information by emphasizing different evidence or advancing different interpretations of facts.

Objectives:

*Briefly explore the Eskimo/Inuit Cultures

*Explore types of shelters used in these cultures

*Conduct an experiment, measuring and charting their findings of the effects of salt on ice

*Use *deductive reasoning skills* to synthesize and apply the knowledge acquired from the study of Eskimo/Inuit homes and the effects of salt on ice to build an igloo made of ice cubes.

Activities: Does Salt have an effect on the temperature of ice?

What you will need:

- A stopwatch
- A thermometer (digital if possible)
- A spoon
- A glass rod for stirring
- Cups
- Salt

Instructions:

- Fill a cup nearly to the top with crushed ice.
- Use the thermometer to measure the temperature of the crushed ice.
- Record the current temperature for comparison later.
- Add 5 spoons of salt and mix well.
- Check and record the temperature of the ice mixture once every minute over the next five minutes. Use your stopwatch to follow the time accurately. Chart the results into a graph and have a look at what happened.

Important Questions:

- So how cold did it get?
- How does this compare to the temperature of the original ice mixture when it had no salt?
- What kind of effect do you think the salt had on this experiment? Why?
- What applications in the real world do you think the results of this experiment could lead to?

Directions For Igloo Activity (Given to students after the activity to compare/contrast their methods to the ones described in the following directions:

What you need

- a couple of ice cube trays
- salt
- a baking tray
- water
- space in your freezer
- a teaspoon
- a 'slushie mix' (place a couple of ice cubes and a little bit of water in a blender).

What to do

You will need about 50 ice cubes in different sizes, so plan in advance. Make about half of the cubes by completely filling the trays, and make the rest of the cubes a mixture of sizes by filling the trays three-quarters full and half-full.

1. Sprinkle some salt on the tray. Arrange about 12 ice cubes in a circle on the tray and put it in the freezer until the ice cubes freeze again.
2. Prepare the ice cubes for the second layer by dipping one side of them into salt. Line up the cubes, salty side down, centering each one between two base cubes (like in a brick wall). Carefully fill in the gaps with your slushie mix and refreeze.
3. Repeat to make more layers, using smaller and smaller cubes. Soon you will see that each ring is smaller than the one under it, creating a dome. Continue until you have just a small hole in the centre of the top. (Don't forget to refreeze your masterpiece once in a while as you work!)
4. Build the doorway by lining up two rows of ice cubes lengthwise to make the walls. Place smaller ice cubes on top of the walls and fill in the gaps with slushie mix.
5. Carefully pat a thin layer of slushie mix over the whole igloo and then place it in the freezer for a couple of hours at least.

What's happening

The salt melts the ice on the area of the cube that you are attaching, helping secure the blocks in place when you freeze each layer later.

Plain water freezes at 0 °C, but salt water freezes at about -1.8 °C. That's why the oceans don't freeze, even when the temperature is below 0 °C.

The salt makes the ice cubes melt faster, because it lowers the freezing point of water. The side of the ice cube with salt on it would need to be much colder than 0 °C to stay frozen. At room temperature this is not possible, so the ice melts.

Did you know?

The term igloo, or iglu, comes from the Inuit word 'igdlu' meaning 'house'.

