Activity
6

Cold as Ice

Ice water can be pretty cold. Is it always the same temperature? Is there anything you can do to make it even colder?

OBJECTIVES

In this activity, you will

- See how salt affects the temperature of freezing water.
- See how low you can decrease the temperature of liquid water.

MATERIALS

computer with Logger Lite software installed
Go!Temp temperature probe
cup
tap water
ice cubes
plastic spoon
2 spoonfuls of table salt
paper towels or rags to clean up spills
tray (if available)

KEY QUESTION

How low can you drop the temperature of water while still keeping it liquid?

PREDICTION

I predict I can drop the temperature of water to _____°C by adding

_____ to the water.

PROCEDURE

1. Make sure the Go!Temp is connected to the computer.

2. Start Logger Lite on your computer.

3. Open the file for this activity by doing the following:
   a. Click the Open button, .
   b. Open the folder called "Elementary Science."
   c. Open the file called "06 Cold as Ice."

4. Fill your cup 1/3 full with water.
5. Do the following to find the temperature of water:
   a. Place the Go!Temp into the cup and stir carefully. Be careful not to spill the water!
   b. Click Collect.
   c. Look at the temperature values in the table on the computer screen in the column called Latest.
   d. Find the lowest temperature in the Latest column and record it in the Data Table below, in the space under the heading: Water temperature.

Data Table		
Water temperature	**Ice water temperature**	**Ice water with salt temperature**
°C	**°C**	**°C**

6. Label and store the data by doing the following:
   a. From the Insert menu, select Text Annotation. In the box that comes up, type: Water.
   b. Move the text box and arrow close to the graph line. **Tip**: By putting your cursor on the corner of the box so it turns to a small double arrow, you can change the size of the box so the words fit well.
   c. Click the Store button, , to save your data.

7. Collect data with ice in the water by doing the following:
   a. Place enough ice in the cup to bring the water level up to about 2/3 full.

b. Repeat Steps 5-6 to collect ice water data.

c. When you write down the temperature, write it under the heading: Ice water temperature, and when you label your data, type: Ice water.

8. Collect data with salt and ice in the water by doing the following:

   a. Add 2 spoonfuls of salt to the ice water.

   b. Repeat Steps 5-6 to collect data for the ice water with salt. When you write down the temperature, write it under the heading: Ice water with salt temperature, and when you label your data, type: Ice water with salt.

ANALYZE YOUR DATA

1. What happened to the temperature of the water as you added ice?

2. What do you think would happen if you continued to add ice cubes to the water? Could you ever drop the temperature below zero degrees Celsius?

3. What surprised you about the addition of salt?

4. What could you do to drop the temperature even more?

Good job!!