

# 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

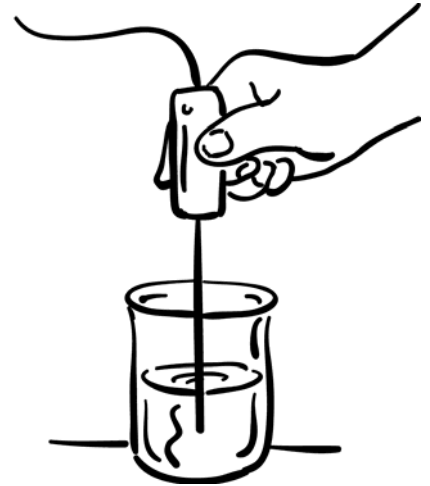
\_\_\_\_\_ to the water.

## PROCEDURE


1. Make sure the Go!Temp is connected to the computer.
2. Start Logger Lite on your computer.

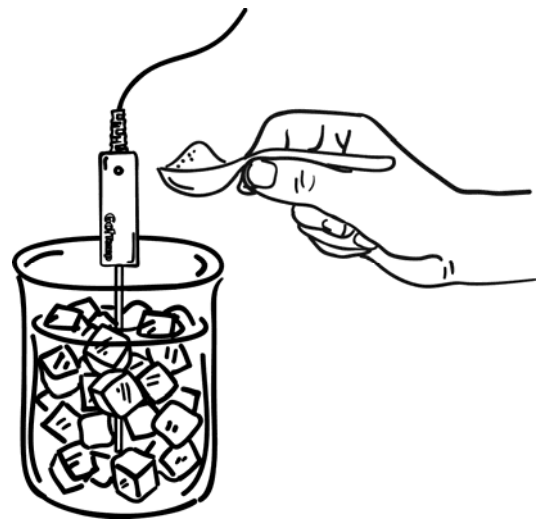
## Activity 6

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?

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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?

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3. What surprised you about the addition of salt?

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

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Good job!!