

This activity was contributed by Daniel Ferron of Charles Hayes Secondary School in Prince Rupert. It addresses BC Learning Outcomes in Science 8, Earth Science 11 and Science

The Melting Ice Paradox

Salt is used in the winter to melt the ice and snow covering roads. Usually, ice melts when the temperature rises above 0° C. In this experiment you will observe how we can speed up the melting of ice with salt.

Purpose: To measure the rate of temperature change of ice melted with salt

Materials:

- Crushed ice (or snow)
- Stopwatch or timer
- 100 -150 mL beaker
- stirring rod
- thermometer
- safety goggles
- 15 mL of salt

Procedures:

1. put some crushed ice in the beaker
2. put the thermometer in
3. observe the temperature going down and record the temperature it stops at
4. leave the thermometer in the ice
5. pour the salt over the ice and start the stopwatch.
6. mix the solution with the stirring rod
7. touch the beaker. What do you notice?
8. turn the stopwatch off and record the temperature again when it stops changing. Record the new temperature
9. calculate the rate of temperature change

Observations:

Results:

- A. _____ temperature of ice **before** salt was added (see #3)
- B. _____ temperature of ice **after** the salt was added
- C. _____ elapsed time (between A and B)

Calculations:

1. Temperature difference. Subtract the A and B _____ ° C
2. Calculate the rate of change.

Rate of temperature = temperature change divided by elapsed time

Rate _____ °C/second

Questions:

1. what did you notice when touching the side of the beaker (#7)
2. What did you observe with the temperature after the salt was added?
3. What was the rate of temperature change?
4. Was this a cooling rate or a heating rate? Explain.

Follow-up: Research the reasons why the temperature did what it did even though the ice melted.