

Investigation Four – Heat Energy and Water

Standard I Students will understand that water changes state as it moves through the water cycle.
Objective 1 Describe the relationship between heat energy, evaporation, and condensation of water on Earth.
Intended Learning Outcomes <ol style="list-style-type: none">1. Use science process and thinking skills2. Manifest scientific attitudes and interests

**STANDARD
I**

Objective
1

Background Information

This activity is designed to develop the concept of heat's influence on solid and liquid water. The activity should also help students differentiate between heat and temperature. Heat is a form of energy that is passed from one object to another because of a difference in temperature. Solid water (ice) remains at approximately the same temperature until it is entirely melted. Heat is being applied throughout this experiment, but the ice absorbs the heat energy until it melts and then the heat increases the temperature of the water.

Pre-Assessment/Invitation to Learn

Prepare the students for this activity by brainstorming with them ideas of how to melt ice in a cup without touching the ice.

Instructional Procedure

1. Have students place a specific amount of ice in their clear plastic cup (about three cubes).
2. Have the students take the temperature of the ice and record the results on the Ice Melt Data Chart found on the worksheet, "Heat Energy and Water."
3. Using the ideas that were brainstormed, allow the students to manipulate the cups and record the ice and water temperatures as outlined in the Ice Melt Data Chart.
 1. When the ice has completely melted into liquid water, have the students Take the temperature of the water. Record and graph results.
 5. Discuss the differences and similarities of various groups' findings.
 6. Reinforce the effect of heat energy on changing the state of water (from ice to liquid to gas).

Materials

Per Group:

- 1 clear plastic cup
- 1 Thermometer
- Ice
- Worksheet, "Heat Energy, and Water"

Curriculum Extensions

Math –

- Using the data from the Ice Melt Chart, graph the change of temperature of melting ice. (*Standard IV, Objectives 1 and 2*)

Assessment Suggestions

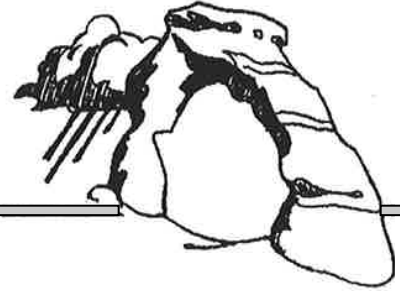
- Have students orally explain why the liquid water temperature is higher than solid water (ice) temperature.
- Have students describe the sources of heat energy that caused ice to melt.

Homework & Family Connection

Brainstorm with your family and write a list of the many ways ice is used in your family. Be sure to be specific. Discuss with your family why it melts if it is out in the warm air.

Heat Energy and Water:

What is the Best Way to Melt Ice?



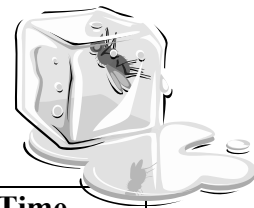
Task:

Melt ice without touching it.

What are your two best ideas for melting the ice?

1

2



Ice Melt Data Chart

Temperature Readings	Temperature	Time
1 st : temperature of solid ice		
2 nd : ice just beginning to melt		
3 rd : melting ice		
4 th : ice almost melted		
5 th : ice completely melted		



Describe what happened during this experiment.

Findin

What did you find interesting as you melted the ice?
