

TRB 4:1 - Investigation 4 - Heat Energy and Water

Summary

This activity will help students differentiate between heat and temperature.

Group Size

Small Groups

Materials

per group:

1 clear plastic cup

1 thermometer

ice

Note: Crushed ice will melt more quickly. However, cubes of ice will allow quantity of ice to be measured more accurately.

Worksheet ["Heat Energy and Water"](#) (pdf)

Background for Teachers

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.

Intended Learning Outcomes

1. Use science process and thinking skills
2. Manifest scientific attitudes and interests

Instructional Procedures

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 Procedures

Have students place a specific amount of ice in their clear plastic cup (i.e., three cubes).

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"](#) (pdf).

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.

When the ice has completely melted into liquid water. Record and graph results.

Discuss the differences and similarities of various groups' findings.

Reinforce the effect of heat energy on changing the state of water (from ice to liquid to gas).

Extensions

Math-

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

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.

Assessment Plan

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.

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