

Heat vs. Temperature: What's the Difference?

Karen Campbell, WVPT

Overview

Topic: Physical Science, Temperature, Heat. In this lesson, students will explore the difference between heat and temperature through the use of the *Eureka!* ITV series and simple experiments. Students will measure temperature and analyze data using a Calculator Based Laboratory (CBL) and a graphing calculator.

Length of Lesson

Two 45-minute class periods

Video/Technology Hardware & Software

Eureka! #20, Measuring Temperature
Eureka! #21, Temperature vs. Heat
 Calculator Based Laboratory (CBL)
 TI-80, 82, or 83 Graphing Calculator
 CBL temperature probes
 PHYSICS program for graphing calculator
 Website: Sprocket Works www.sprocketworks.com

Learning Objectives

The student will be able to:

- define heat and temperature
- understand that heat and temperature are not the same
- distinguish between heat and temperature
- demonstrate the indirect measurement of heat by measuring temperature change
- compare the amount of heat given off by various objects
- collect, record, and interpret data
 (This lesson addresses Va. SOLs Science 6.1, LS.1, PS.1, PS.5, PS.7; Math 6.9, 6.18, 7.20, 8.13; Computer/Technology 8.4)

Materials and Teacher Preparations

Per class:

- 3 beakers
- access to hot and cold water
- 2 large containers (gallon jars or plastic pails)
- 1 1000 ml beaker
- hot plate
- 2 tongs
- thermometers (Celsius scale)

Per group of 4-6 students:

- 2 beakers
- 2 bolts (1 large and 1 small)
- room temperature water
- CBL, graphing calculator, and 2 temperature probes

Per student:

- "Turn Up the Heat" worksheet
- "Temperature vs. Heat" worksheet

Preparatory/Pre-Viewing Activities

1. Before the class: Label three beakers as Beaker A, Beaker B, and Beaker C. Fill beakers with water: Beaker A — cold water (from water fountain or refrigerator), Beaker B — room temperature water, and Beaker C — warm water (from faucet). Caution: Students are going to put their fingers in the



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