

Science Demo: Heat, Temperature, and Energy Lab Activity

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BACKGROUND INFORMATION

Subject(s): Science

Topic or Unit of Study: Heat transfer.

Grade/Level: 7

STANDARDS & ASSESSMENT

Standards:

- ■ ■ **NJ- New Jersey Core Curriculum Content Standards**
 - **Subject :** Science (2009)
 - **Standard :** 5.1 Science Practices: Science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.
 - **Range/Grade Level :** By the end of grade 8
 - **Strand :** A. Understand Scientific Explanations: Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.
 - **Cumulative Progress Indicator :** 5.1.8.A.2 Use mathematical, physical, and computational tools to build conceptual-based models and to pose theories.
 - **Standard :** 5.2 Physical Science: Physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science.
 - **Range/Grade Level :** By the end of grade 8
 - **Strand :** C. Forms of Energy: Knowing the characteristics of familiar forms of energy, including potential and kinetic energy, is useful in coming to the understanding that, for the most part, the natural world can be explained and is predictable.
 - **Cumulative Progress Indicator :** 5.2.8.C.2 Model and explain current technologies used to capture solar energy for the purposes of converting it to electrical energy.

Assessment Plan: Teacher observation/Class Participation, Mastery of science concept.

Assessment/Rubrics:

IMPLEMENTATION

Goal(s): The students will develop a better understanding of one concept of heat transfer called radiation.

Objective: How does heat transfer through radiation?

Can the student identify radiation as a type of heat transfer?

The objectives of this lesson are of the cognitive domain as outlined in Bloom's taxonomy.

Purpose: The purpose of this lesson is to build upon the student's prior knowledge of heat transfer through radiation. Energy is transferred from place to place. Energy from the sun travels in the form of electromagnetic energy which contains ultraviolet radiation.

Procedure: **Science Lab:**

Heat Transfer Lab Activity: Radiation

In this lab activity you will investigate the way heat is transferred by radiation.

Make sure to follow all directions *in italics letters* and answer all questions in **bold letters**.

Materials: Lamp

Ruler

Procedure: (5 minutes)

1. Turn the lamp on. Wait about a minute.
2. Hold the palm of your hand about 10cm from the side of the bulb for about 15 seconds. Remove it if gets too warm.
3. Now hold the palm of your hand about 10cm above the top of the bulb for about 15 seconds.

Remove it sooner if it gets to warm.

4. In which location did your hand feel warmer (above or on the side of the light bulb)? _____

5. Explain your observations in terms of radiation. Explain how the heat RADIATED from the light bulb to warm your hand. _____

Two things I learned today... _____

Attachments

- | |
|---|
| 1. radiation graphic organizer.docx Radiation graphic organizer |
|---|

Special Needs Component [modification(s)]:

Student will work with a "lab buddy" and be given extra time to complete the lab activity.

Sample Student Products:

Model(s) of Instruction:

The model of instruction for this lesson is discovery/inquiry.

Time Allotment:

1 class period. 10 Min. per class.

Author's Reflection (s)/Critical Analysis:

MATERIALS AND RESOURCES

Instructional Materials:

Resources:

- Materials and resources:
Lab worksheet.
Lamp.
Ruler.