



Watts On Your Mind?

Solar energy educational activities for schools

Activity Overview

Grade Level: K-2

Activity: LE-6

General Description

Students will use thermometers and discuss different temperature scales.

Learning Outcome

Students will read thermometers, recognize that different materials have different temperatures and recognize that the location of objects influences temperature.

Subjects

Science, math

Process Skills

Observation, measurement

Duration

30 minutes

Key Vocabulary

Fahrenheit, Celsius

Curriculum Standards

Texas (TEKS)

112.2.a.4

Louisiana (LSCS)

ESS-E-B5

Arkansas (ASCF)

3.1.4

National (AAAS Project 2061)

The Physical Setting – 2nd grade

Using Thermometers

Materials

- thermometers
- various locations in classroom
- paper to record thermometer readings

Method

1. Discuss appropriate safety issues.
2. Discuss importance and use of thermometers.
3. Put list of locations on board for students to measure with thermometer.
 - Floor (near door, near window...)
 - Wall (high-low, interior-exterior...)
 - Window (interior-exterior, sun-shade)
 - Desk (top, legs, inside)
 - Chairs (wood, metal...)
 - Outside (sun, shade, asphalt, concrete, grass...)
 - Anything else you might want to include
4. Students should predict locations and objects that will be relatively warm and those that will be relatively cool and should give reasons for the predictions.
5. Students take temperature readings and record them on paper.
6. Discuss results.

Discussion

Measurements made with thermometers are the basis for nearly all descriptions and forecasts of weather patterns around the globe. Thermometers are sensitive instruments used by scientists to gauge the amount of thermal energy in solids, liquids, and gases.

Thermometers can be used in the classroom as well. This exercise demonstrates that objects can have different temperatures even when they are in the same room. In many cases, one side of a classroom can be



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several degrees warmer than the other side, due to the location of windows, heating and air conditioning vents, and even people (who give off heat!).

Solar energy also plays a role in every classroom. Solar energy causes walls, floors, and air on the south side of a room to warm up. In the case of air, warmer air tends to rise. When it rises, cooler air from across the room moves in to take its place. Solar energy therefore can cause air to circulate slowly within a room even without any fans.

Outside, solar energy causes the temperatures of side-by-side object to vary, too. Depending on whether objects are in the sun or shade, and on the ability of the object to absorb solar energy, these temperature differences can be very strong.

When students are predicting which locations and objects will be warmer or cooler than others, lead them in a discussion about what could cause the temperature to be different in different areas of the room. Possible causes of variable temperatures in a classroom include:

- Proximity to sunlight (drafts and thermal energy)
- Location of air flows (heating or cooling)
- Location of equipment that gives off heat (computers, lights, motors, fans, etc.)
- Location of people
- Materials with different levels of conductivity (brick, metal, wood, fabric, etc.)

Assessment

The students read thermometers and recognize that different materials and different locations have different temperatures. Teachers can use students' recorded observations as an assessment tool. Observations can be assessed for clarity of organization and accuracy.

In order to promote further student analyzing, questioning, and investigating, the following teacher questions and comments may be useful at the conclusion of any activities/investigations. These questions can be used for small/large group discussions, science log/journal entries, or as writing prompts.

How do you feel about your results? Are they valid?

What, if anything, would you change to make your results more valid?

Did your results cause you to think of more questions to explore?

Source: This activity adapted from "Thermometers" created by the Florida Solar Energy Center.