Fun in the Sun & Shade

Summary

The students will compare temperatures of soil and water in and out of the sun, and recognize that the sun heats the land and water.

Materials

For each group:

Four white bowls -- disposable plastic or Styrofoam bowls work best. White is used so color of the bowl doesn't influence the amount of heat absorbed.
soil
2 liter bottle filled with water room temperature
Two thermometers (one used for shade and one used for sun -- cleaning off soil before placing in water.)
marker

- Scribe recording sheet (pdf)
- Recording pages (pdf)
for each student *Fun in the Sun and Shade*.

Books:

- *Sun*
by Melanie Mitchell. ISBN: 978-0822535935
- *The Sun*
by Laura Hamilton Waxman. ISBN-13: 978-0761349877
- *Hello Sun!*
by Hans Wilhelm. ISBN-13: 978-1575053486

Background for Teachers

The sun is the primary source of heat for the Earth. It heats the air, land, and water. Land heats up more quickly than water, but it also cools down more quickly.

Intended Learning Outcomes

1. Use science process and thinking skills.
f. Conduct a simple investigation when given directions.
h. Use observations to construct a reasonable explanation.
3. Understand science concepts and principles.
a. Know science information specified for their grade level.
c. Explain science concepts and principles using their own words and explanations.
4. Communicate effectively using science language and reasoning.

Instructional Procedures

Invitation to Learn:
Have students close their eyes and imagine a hot, sunny day. Sweat is starting to form on their forehead. They can feel the heat through their clothing. Nothing sounds better than a big, tall, cold class of lemonade or water. Ask: "Where outside would you like to drink your lemonade?" After playing a fast paced game of basketball, where do you want to rest?" Ask other questions that will lead them to answer that they would like to be in the shade. Then discuss why they would like to be in the shade. Talk about the differences between the temperature in the shade and the temperature in the sun. Have them write in their journal about how they feel in the sun and shade on a hot day.

Reverse this idea and talk about a cool, breezy day. Compare the temperature of the sun and shaded areas. On a cold day, where would they rather be -- The sunny spot or the shady spot?

Instructional Procedures:

Fun in the Sun & Shade:

Ask students, "What causes land and water to be warmed?"

Tell students that they will be experimenting to see how much the sun warms land and water.

Distribute four bowls to each group of students. Have students write their names on the sides of the bowls. Label one bowl "Sun -- soil" and one bowl "Shade -- soil." Tell them that they are to fill these bowls with soil. Allow time or two students from each group to go to the area where the soil is to fill their bowls. The other two bowls need to be labeled "Sun -- water" and "Shade -- water."

Inform students that one bowl of soil will be placed in the shade and the other bowl will be placed in the sun. Tell them that they will do the same thing with bowls of water; however, to prevent spills, they will pour the water into the bowls once they are outdoors. Also have them decide who in their group will be the scribe. The scribe will need to take out the recording sheet and thermometers.

Take the students to the preselected area and have each group put one set of bowls in the sun and one set in the shade. Have them fill each empty bowls with ½ cup water from the 2liter bottles. Make sure they add the same amount of water to the bowl as there is soil in the companion bowl. Students need to take the temperature of each bowl. Have the scribe for the group, record the temperatures of each bowl before going back inside.

Upon returning to the classroom, have students fill out the Before section on their recording sheet.

Have students discuss and predict what will happen to the temperatures of the water and soil. They can record these on their recording sheet.

Have students look over and read their observation sheet and see what observations and questions they are going to need to answer once they return inside. (I would suggest they read it together as a group.)

After 2530 minutes, go back outside and have each group gathers their bowls. Be sure the scribe takes their thermometers and recording sheet to record the temperature. First students need to compare the temperatures of the bowls by placing their hands in each bowl labeled "Soil." Can they feel the temperature difference? They will need to record this observation when they return to class. Have students take the temperatures of both soils and both water. The scribe should record the temperature in the chart provided.

Next have students pick up their bowls and empty the water on nearby plants or the grass then return to the classroom where they will put the soil back in the container.

Students can then share their findings and complete the recoding sheet "Fun in the Sun and Shade."

Have groups share as a whole class their findings and compare their experiences.

Lesson and Activity Time Schedule:

Each lesson is 55 minutes.

Each activity is 35 minutes.

Total lesson and activity time is 90 minutes.

Extensions

Look at the effect color has on how hot something gets when placed in the sun. Compare dark soil with light soil or put water in bowls of different colors and/or materials. Does water in a metal bowl get hotter than water in a plastic bowl? Does lightcolored sand stay cooler than dark potting soil?

Use three or four different materials (wood, metal, plastic, etc.) and order them from hottest to coolest after 30 minutes in the sun.

Family Connections:

Assignments to do with parents:

Discuss with parents activities done in the sun and shade.

Discuss with parents how life would be different without the sun.

Research different states or countries that have a warm climate vs. those that have a cold climate. How do those differences affect the activities people can choose?

Assessment Plan

Fun in the Sun Recording Sheet

Discussion/questions about the sun

Authors

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