

# Weather Whys

**Standard II**

Students will gain an understanding of Earth and Space Science through the study of earth materials, celestial movement, and weather.

**Objective 3**

Observe, describe, and measure seasonal weather patterns and local variations.

**Intended Learning Outcomes**

Generating evidence: Using the processes of scientific investigation (i.e. framing questions, designing investigations, conducting investigations, collecting data, drawing conclusions)

Communicating Science: Communicating effectively using science language and reasoning.

Knowing in Science: Understanding the nature of science.

Content Connections: Language Arts, Math

## Background Information

The purpose of this lesson is to heighten students' awareness of weather by allowing them to observe weather conditions and to discover weather-related phenomena in their immediate environment. These investigations should be fun and exciting, thus opening doors of inquiry and the desire to know more.

We are especially conscious of the change of seasons when we are deciding what to wear and what to do. What do we wear in the summer? We wear light-colored fabrics because they reflect the light of the sun away from us. Thus, heat is also reflected away from us. When the weather becomes cool, we put on heavier, darker clothing. Heat from our bodies does not escape as easily from heavy clothing as from light clothing. Heat from the sun is not reflected away from us by dark clothing.

## Research Basis

Davenport, M.R., Jaeger, M., & Lauritzen, C. (1997). Integrating Curriculum. *The Reading Teacher*, 50(4).

This article views curriculum in three aspects: curriculum in action provides a rich context for inquiry and exploration, beliefs into action emphasizes that teachers do not simply transmit information to learners; they take on the role of facilitating students' construction of their own knowledge, caring communicates to students that their background, experience, interest, and inquiries are worth exploring.

Marzano, R.J., Pickering, D.J., Pollock, J.E. (2001). *Nonlinguistic Representations. Classroom Instruction That Works: Research Based Strategies for Increasing Student Achievement*, pages 72-83.

The more we use linguistic and nonlinguistic representations, the better we are able to think about and recall knowledge. Explicitly engaging students in the creation of nonlinguistic representations stimulates and increases activity in the brain.

## Assessment Suggestions

- Science Journal/Foldables/Graphic Organizers:
  - Students define weather vocabulary.
  - Students make graphs showing temperature comparisons and precipitation totals using tally and nonstandard measure.
  - Students develop a K-W-H-L or K-W-L chart.
  - Writing Activity:
    - Hot (or Cold) Smells Like \_\_\_\_\_
    - Hot Feels Like \_\_\_\_\_
    - Hot Tastes Like \_\_\_\_\_
    - Hot Sounds Like \_\_\_\_\_
    - Hot Looks Like \_\_\_\_\_
  - Students draw a picture of what they look like at 90° and 32°.

### Materials

- Suitcase of seasonal clothing

## Invitation to Learn

1. Prepare a suitcase of clothing.  
Say: "It is \_\_\_\_\_ degrees outside. What will I wear?"  
Invite students to select and dress in clothing.  
*Variation:* Pack a suitcase of clothing. Have students predict where you might be traveling to by what is packed.  
Somewhere warm? Somewhere cold? Why?
2. Who Cares About the Weather?
  - Brainstorm as a class who would care about the weather and why.
  - Make a mural of pictures of how weather conditions affect us.
  - Make a class book (possibly ABC book) about "Who Cares About the Weather?"

## ***Instructional Procedures***

### **Thermometer Practice**

Most students are interested in watching the daily temperature. They hear about it on the radio and television. They feel it when they are walking to school. Temperature determines whether they can go ice skating or swimming. Can your students individually read a thermometer?

1. Place the thermometer in a bowl of ice. What happens? (If the thermometer is accurate, it should register close to 32° F. Crushed ice works best to reduce the amount of air surrounding the ice.) Place it in the warm water. Observe the temperature difference. Try the same experiment by placing the thermometer outdoors on a cool day and then in the warm classroom.
2. Place identical thermometers in four different parts of the room. Make a chart. Record the temperatures every hour during the school day. Are they always in the same relationship? Discuss factors affecting the changes, such as an open classroom door, the position of the sun, and the heat from the heater. Does having students in the room tend to lower or raise the temperature?

### **People and the Seasons**

1. From observation and previous experience, develop a chart showing different temperature, weather conditions, and appropriate clothing. Use symbols and words (e.g., one entry might say 90 degrees-very hot; wear light-weight clothing).
2. Place the wooden board in a sunny place. Lay both a black paper and a white one on it. Touch the papers fifteen minutes later. Do they feel the same? Why or why not? Lift the papers and touch the board under each. The part of the board under the white paper is cool, but it is warmer where the dark paper rested. Why?

*Variation:* Experiment with different colors of paper.

3. Fill two bottles with hot water and put the caps on them. Wrap one with a woolen cloth. Place both bottles in a cool place. After an hour, check the temperature of the bottles. Which bottle is warmer? Why?

#### **Materials**

- Large weather thermometer
- Bowl of crushed ice
- Bowl of warm water

#### **Materials**

- Wooden board
- White paper
- Black paper
- Pan of hot water
- Woolen cloth
- 2 unbreakable bottles

**Materials**

- Snow
- Clear cups
- Paper clips, toothpicks, or other nonstandard tools of measurement

**Investigating Snow**

1. Most children living in Utah have experienced snow. If you live in a location that doesn't receive snow, adapt this activity to more discussion.

Children love snow, so make the most of it. At the first sign of snow, have your students classify it as wet or dry. (Wet snow is sticky or partially melted. Dry snow is firmly frozen.) Can your students find out why the snow is wet or dry? (Wet snow occurs when the temperature outside is near or a little above freezing and the temperature in the upper atmosphere is at the freezing point. When the snow falls and hits the warmer air it begins to melt. Dry snow occurs when the temperature outside is at or below the freezing point.) Have students classify the beautiful white substance as powdery snow or pellet snow (snow in hard, little balls similar to hail).

2. This is an appropriate time to discuss the difference in the types of snow storms. What is a blizzard as opposed to a snowfall? (A blizzard is an intensely strong cold wind filled with fine snow.) What kind of storm would be more likely to form snowdrifts? What causes a snowdrift? (Snowdrifts can occur during any type of snow storm, and they are caused by the wind. You usually get much bigger drifts formed during a blizzard because of the strong winds.)
3. How much water does snow contain? Mark the side of a clear cup using nonstandard measures (e.g., paper clips, toothpicks, etc.). Ask the students to gather enough snow in the cup to equal one nonstandard measure when melted.
4. How clean is the snow? Collect two cups of snow while it is still falling or right after it stops. Let it melt. Put a clean paper towel over your collecting can. Pour the snow water into the glass through the towel. How clean is the towel?

**Curriculum Extensions/Adaptations/Integration**

- **Comparing Weather**

1. Write to a person (or an entire class) in a town 300 miles to the east or west of your town. (Try to choose a town that is at nearly the same latitude.) Arrange with the person or class to keep a chart for two weeks. Make sure that you agree on a starting day.

2. Each person or class should fill in the chart once in the morning and once in in the afternoon. After two weeks, make a copy of your weather chart and mail it to the other person or class.
3. After you receive their chart, compare the two. Did both towns have the same weather at the same time? Did one town get the same kind of weather after the other town? Did both towns never receive the same weather? From this information, can you see which direction air masses tend to move? Which direction is it? How could you use this information to predict local weather?

- **Reflections of Weather**

Sunglasses are worn in all seasons to reflect the sun's bright rays. They may also be worn in the winter to reflect the bright snow.

1. Make copies of the *Sun Pattern* for each student.
2. Students color then cut along the dotted lines in the sunglasses.
3. Pictures are drawn on a strip of paper 1" x 12" that slides through the sunglasses showing what would be seen in hot weather.

## Resources

### Books

*Who Cares About the Weather?*, by Melvin Berger;  
ISBN 1-56784-029-9

*The How and Why Wonder Book of Beginning Science*,  
by Jerome J. Notkin; ISBN 0843130407

*Weather*, by Lisa Miller Molengraft; ISBN 0-88012-902-6

## Family Connections

- Help a family member sort your clothes in piles for hot weather, cold, or in-between. Make a list of your clothing using those categories.
- *Scavenger Hunt:* In this activity, students go outside and collect, list, or sketch things that are weather related. This activity is best done on a sunny day. Some clues can be collected in bags; most can be drawn or described on paper.

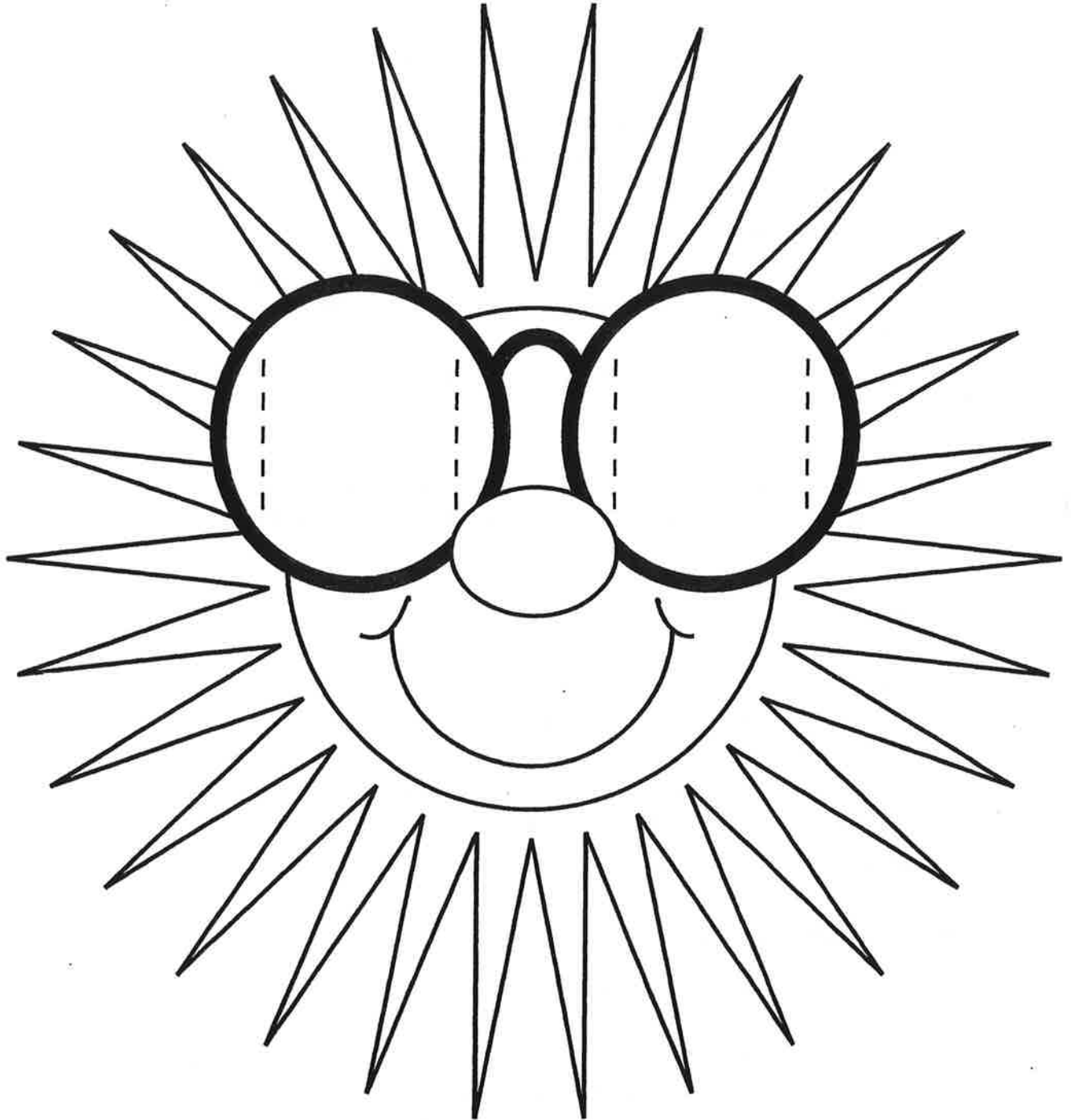
### Materials

- *Sun Pattern*

### Materials

- *Scavenger Hunt Clues*
- Paper/notebook
- Pencil

# Sun Pattern



2nd 2-3 4.6

Name \_\_\_\_\_

## *Scavenger Hunt Clues*

Locate and collect/record the following items:

1. Something that needs sun.
2. Something that is blowing in the wind.
3. Something that is bending in the wind.
4. Something that cannot bend in the wind.
5. Something that could protect you from the rain.
6. A place that gets no, or very little, sunshine.
7. Something that reflects the sunlight.
8. A cloud.
9. Something the color of a cloud.
10. Something that is the color of the sky on a sunny day.
11. Something that is a sign of the season (leaves turning color, plant shoots, bird nests, tree blossoms, acorns, insects, etc.).
12. Something that the wind has moved from place to place.
13. A shadow of a living thing.
14. A shadow of a nonliving thing.
15. Something that has been damaged or changed by the weather.
16. A piece of clothing that has something to do with the weather.
17. Something that could soak up the rain.
18. A puddle.
19. Something that feels warm from the sun.
20. Something that is damp.

2nd 2-3 4.7

Junior Scientist's Name \_\_\_\_\_

# *My Science Journal*