

# Activity—Minds-on Science

## Standard II

Students will understand that the elements of weather can be observed, measured, and recorded to make predictions and determine simple weather patterns.

## Objective 1

Observe, measure, and record the basic elements of weather.

## Intended Learning Outcomes

2. Manifest scientific attitudes and interests.

## Standard II

## Objective 1

## Connections

### Background Information

There are many books, online activities, and resources to teach students about weather. The USOE fourth grade web page provides links to many sources of information. The Sciber Site has information and activities for students to use. The TRB (Teacher Resource Book) contains lesson plans and information. Teachers should become familiar with the ILOs listed there, along with the objectives and indicators for the unit on weather. The test-item pool is also a good resource for assessment items teachers can use. Finally, teachers can find children's literature books that can be placed in the classroom during this unit for student use.

### Invitation to Learn

Display children's literature books at the front of the room on the chalkboard tray or a table. Also display weather posters and charts.

### Instructional Procedures

1. Hold up copies of children's literature books and give the title and author.
2. Show the resource books and materials available to learners.
3. If a computer with a projector and internet connection are available, show the USOE web site and some of the resources there.
4. Make the book available for students to check out.

### Possible Extensions/Adaptations/Integration

Use "big books" when possible. Some children's books are also printed in Spanish. Enrichment activities are suggested in the Sciber Site lessons. Assign the students to present a written or oral report on one of the books they have read.

### Materials

- (optional) USOE science web pages for fourth grade on a computer linked to a projector & internet
- children's literature books (see corresponding list)
- copy of Teacher Resource Book for fourth grade science
- printed copy of Sciber Site lesson plans.
- copy of teacher resource books on weather (provided by presenter)
- copy of student journals

### **Assessment Suggestion**

Have students check out the books by signing their name on a list. This will allow the teacher assess which books are being read, and by which students. Assess students understanding of writing and material through book reports.

### **Additional Resources**

1. Students can access web sites on weather (i.e., [www.brainpop.com](http://www.brainpop.com) and [www.ksl.com](http://www.ksl.com))
2. There are videos available on weather through district media centers. DK Vision has a video called Eyewitness Weather that is good ([www.dk.com](http://www.dk.com)).
3. Teachers can download videos from Digital Curriculum on the Pioneer website.

### **Homework & Family Connections**

Teachers could assign students who have internet connections at home to visit the USOE Sciber Site and do some of the activities at home.

Students can use some of the science books available to conduct experiments or make projects at home. They could also display some of their projects at a school science fair.

## **Science Literature List**

### **Weather**

*Can It Rain Cats and Dogs?* by Berger (Scholastic)  
*The Wind Blew* by Hutchings (Scholastic)  
*Looking At Clouds* by Ring (Newbridge)  
*Cloudy with a Chance of Meatballs* by Barrett (Scholastic)  
*Magic School Bus—Inside A Hurricane* by Cole (Scholastic)  
*Weather Words* by Gibbons (Scholastic)  
*Weather* by Wyatt (Kids Can Press)  
*The Tornado Desk* by Leavitt (Talon Printing)

### **Plants and Animals**

### **The Water Cycle**

### **Rocks, Soil, and Fossils**

*Suggestion:* Start collecting children's literature books that go with the various science topics taught in fourth grade. Set them out as you begin each unit for children to borrow. Show each title and tell them what it is about to spark some interest. Read a few of them aloud as time permits. Have a sign-out sheet available.

## ***Weather Words***

*Accuracy*—correct, careful and exact

*Air pressure*—the weight of air in the atmosphere pressing down upon the Earth

*Air temperature*—degree of hot or cold that the air measures

*Anemometer*—instrument used to measure wind speed

*Atmosphere*—all the air surrounding the earth

*Barometer*—instrument for measuring air pressure

*Cirrus*—high, wispy or feathery clouds

*Components*—the parts of the whole (Example: wind is one component of weather)

*Cumulus*—big, puffy, white clouds

*Forecast*—to predict (a meteorologist will forecast the weather for the next week)

*Hygrometer*—instrument used to measure relative humidity

*Meteorologist*—a scientist who studies and forecasts weather

*Phenomenon*—an occurrence you can observe

*Precipitation*—rain, snow, sleet, hail, etc.

*Rain gauge*—instrument for measuring the amount of rain that falls

*Relative humidity*—amount of water vapor in the air compared to the amount of water the air could hold at that temperature

*Severe*—serious or intense (Example: a tornado is a severe type of storm)

*Stratus*—a long, low, gray cloud

*Thermometer*—instrument for measuring temperature

*Weather front*—meeting of two different types of air masses

*Wind speed*—measurement of the speed of moving air

*Wind vane*—instrument used to determine wind direction

## **Severe Weather**

Have you ever planned an outdoor party or activity and had it ruined by bad weather?

The components or parts that make up our weather can be compared.

A hurricane is born over warm oceans. Winds are at least 75 mph. The width of a hurricane can be many miles.

A tornado is a whirlpool of windy air over land. Winds can be 300 mph. The path of a tornado can cover several miles, but the width of a tornado is much smaller than a hurricane, usually covering an area less than 100 yards.

A thunderstorm is a storm with rain, high winds, dark clouds, lightning and thunder.

Rainstorms have dark clouds, rain showers, and breezes.

### **TRY IT**

Ask your teacher if you can create the sound of a storm in your classroom. Start by turning off the lights and having everyone tap one finger on their desk as it start to rain. Tap all of your fingers on your desk as it rains harder. Have someone switch the lights on and off quickly for the lightning. Add snapping fingers and stomping feet as the storm gets worse. Finally, do the sounds more quietly in reverse as the storm moves away.

## ***The Sun will Rise again!***

### **HERE COMES THE SUN!**

The title above is just one of many songs that have been written about the sun. After all, we owe that big ball of fire in the sky quite a bit. The sun is responsible for the abundance of life that is found on Earth. Without the energy provided by the sun, this planet would be a dark, cold lifeless place. The sun is also responsible for the weather on planet Earth. One kind of energy we get from the sun is heat. The sun does not directly heat up the air. Air is heated by the land or water beneath the air. Because land and water heat up and cool down at different rates, the air also heats unevenly. This uneven heating of the air causes wind and changes in the weather.

### **YOU ARE THE SCIENTIST!**

Do you think that soil will heat up more rapidly than water? Record your hypothesis and then perform the following activity to find out if you were correct:

**MATERIALS:** This is what you need.

2 identical paper or plastic cups

water

soil

2 thermometers

**PROCEDURE:** This is what you do.

Fill one cup half full of water and one cup half full of soil.

Let the cups sit in a room for a couple of hours. Make sure the sun isn't shining on them. You want them both to have time to become room temperature.

Place a thermometer in each cup. Be sure the bulb of the thermometers is deep into the water and the soil.

Record the beginning temperature of each thermometer.

Place both cups in the direct sun, or under a bright lamp. Make sure both cups get equal amounts of light.

After 15 minutes, record the temperatures of each thermometer.

Place both cups in the refrigerator for fifteen minutes.

Record the temperatures of each thermometer.

Explain your findings. Which material heats up faster? Which material cools down faster?

Graph your results.

### **WARMING UP!**

While performing this activity you probably noticed that the soil warmed up faster than the water. You probably also noticed that the soil cooled down faster than water. The same is true on Earth. Land heats up faster than water. The air over warm or hot land heats up more rapidly than air over the oceans in the summer. The air above the land rises and the cooler air over the ocean moves in from the ocean to take the place of the rising air over the land. That is why it is usually cooler in places very near the ocean in the summer.

### **COOLING DOWN!**

The opposite is true in the winter. Places very near the ocean in the winter will not be as cold as places further away. Water in the ocean will not cool down as fast as the land cools. San Francisco, California is usually cooler in the summer and warmer in the winter than Delta, Utah because Delta is not near the ocean. The air temperature over Delta is affected by the land of the Great Basin. The air temperature over San Francisco is affected by the water over the Pacific Ocean. There are other things that affect temperature, but this is one thing that makes a big difference.

### **GO THERE!**

If you live near the Wasatch Front, you know that the cold weather and the mountains provide Utah with a great resource - tourism. People come from all over the United States and the world to ski and snowboard. Use a map and the internet to find out more about the climate in an Asian city that is near the ocean and at the same latitude as the city where you live. Write a report about the climate of the city. How is the weather similar to the weather in your city? How is it different? What economic impact does the climate have on the city you are writing about?

*Text excerpt from: The Fourth Grade Sciber Site*

*<http://www.usoe.k12.ut.us/curr/Science/core/4th/4thSciber/WEATHER/SUN/sun.htm>*