



K-2 Earth Science

Southern Nevada Regional Professional Development Program

Weather Observations

INTRODUCTION

Weather affects everyone on a daily basis, even young children, from the clothing we select to wear to the outdoor activities we plan to participate in.

WHERE'S THE SCIENCE?

Scientists who study, observe and record information about the weather and use that information to forecast the weather are called **meteorologists**. **Weather** is the condition of the atmosphere (air) at a given time and place. It tells how the air moves, as well as anything it might be carrying, such as rain, snow, or clouds.

Temperature tells us how hot or cold the air is. Temperature can be measured in Fahrenheit or Celsius. When one looks at the sky they may see **clouds**. **Clouds** are a collection of tiny water droplets or ice crystals floating in the air above the surface of the earth. The basic types of clouds are: **cirrus**, **cumulus**, and **stratus clouds**.

Cirrus clouds are high in the atmosphere and are usually thin.

Cumulus clouds are thick, puffy and large.

Stratus clouds are low in the atmosphere and are gray.

MATERIALS

- Thermometer
- Rain gauge (available at your local Wal-Mart or Target)
- Anemometer www.deltaeducation.com
- Science notebook

PROCEDURES

Lesson One: Observing the Weather

1. Call the students to the group area and pose the following question: “What is the weather like today?” Ask the students to turn to a buddy and discuss their observations. Then have the students share with the entire class and chart student responses. Save this chart for the end of the unit.
2. Pose the following question: “What does the air have to do with weather?” Tell the students that you are going to take them outside to observe the weather and feel the air.
3. Once outside, ask the students to describe the weather and to talk about how the air feels. Explain that when people talk about the **weather** they are talking about the condition in the air outside. **Weather** is the condition of the atmosphere (air) at a given time (delta.com).
4. Return to the group area inside the classroom. Share out weather observations and chart. Pass out science notebooks to the students and have them record their observations in their science notebook.
5. Read and discuss a section from a nonfiction resource about watching the weather. (See additional resources).
6. Call the students back to the group area and ask them to draw a line in their science notebook below their weather observation notes and to record what they learned today. Collect the science notebooks.

Lesson Two: Measuring Temperature

Safety reminder: Do not use mercury thermometers.

1. Call the students back to the group area and review what they learned about the weather during the last lesson. Show them an outdoor thermometer and ask if anyone knows what this weather tool is. Introduce the term **meteorologist**. A **meteorologist** is a scientist who studies the weather. Explain that one condition of the air that meteorologists collect and record is the air **temperature**. The tool they will be using to measure the temperature is called a thermometer. **Temperature** tells us how hot or cold the air is.
2. Pass out small individual thermometers to the students. Have the students place their thumb on the red bulb at the base of the thermometer and observe what happens. Share observations. Explain that the red liquid in the thermometer is receptive to temperature and moves down when it gets cooler and up when it gets warmer. Instruct them on how to read the thermometers. Explain what the numbers and lines are used for. Tell them that the letter F stands for degrees Fahrenheit.
3. Pass out science notebooks to the students. Have the students collect and record the temperature indoors. Move outside and have the students collect and record the air temperature in the shade. Next, move to a sunny location and collect and record the air temperature. Ask the students if the air temperature is cooler or hotter in the shade.
4. Finally, discuss today's weather and allow the students' time to record the weather conditions in their science notebooks while sitting outside.
5. Return to the group area in the classroom, and ask the students to check the temperature of the classroom. Is it cooler or warmer than it was outside?
6. Read a section from a nonfiction selection about thermometers. The Delta Science Reader *Weather*

- Instruments has a useful section titled “How Do We Measure Air Temperature?” (see additional resources)
7. Ask the students to record what they learned about air temperature today in their science notebooks. Share with the entire class. Allow students to add to their science notebooks if they like. Collect science notebooks.

Lesson Three: Cloud Types

Note: This lesson should be completed on a day when there are various types of clouds in the sky.

1. Call the students to the group area and write the word “cloud” on a large sheet of paper. Ask the students what they think of when they hear the word “clouds”. Share and chart responses.
2. Take the students outside to observe the weather and point out the clouds in the sky. Ask the students if the clouds all look the same or are they different.
3. Call the students over to a shady area where they can still observe the various clouds in the sky and introduce the three basic types of clouds.
 - Cirrus** clouds are high in the atmosphere and are usually thin.
 - Cumulus** clouds are thick, puffy and large.
 - Stratus** clouds are low in the atmosphere and are gray. They can cover the whole sky.

<http://inclouds.com/Wx/> This website includes information about the three basic types of clouds as well as pictures.
4. Ask the students to identify what types of clouds they see in the sky today.
5. Pass out science notebooks, pencils, and thermometers to the students while you are outside and ask them to record the weather in their science notebooks. Instruct them to include a sketch of the clouds in the sky and to label them. They can also record the temperature in the shade and sun.

6. Return to the group area in the classroom and ask students to record what they learned about clouds in their science notebooks. Share out and add to the “cloud” chart, then allow students to add more to their science notebooks. Collect materials.

Lesson Four: Measuring the Rain

1. Call the students to the group area and review what they have learned so far about the weather (conditions of the sky, air temperature, and types of clouds). Tell them another condition of the atmosphere that meteorologists observe and record is the amount of water in the atmosphere.
2. Review the three main types of clouds and ask the students what can happen when we have dark stratus or cumulus clouds in the sky.
3. Hold up a rain gauge and introduce it to the students. Explain how to use the lines on the rain gauge to measure the amount of rainfall.
4. Pass out science notebooks to the students and have them draw a sketch of the rain gauge and describe how meteorologists use a rain gauge to record rainfall.
5. Read a section from a nonfiction selection about the rain or rain gauges. The Delta Science Reader *Weather Instruments* has a useful section titled “How Do We Measure Precipitation?” (see additional resources)
6. Ask the students to record what they learned about recording the amount of rainfall in their science notebooks.

Lesson Five: Measuring the Wind

Note: Do this lesson on a day when it is windy.

1. Call the students to the group area and ask them to describe the wind. Ask the following questions: “Can you see the wind?” “Can we feel the wind?” “How do we know when the wind is blowing?”

2. Take the students outside to a shady location where they can feel the wind. Have the students close their eyes and ask them if they can feel the wind on their face. Ask them what wind is. (Moving air)
3. Tell the students that meteorologists also measure and record the wind. Hold up an **anemometer** and explain to the students that this is a tool to measure how fast the wind blows. Let the anemometer spin in the wind as the students observe. Explain that a counter keeps track of the number of times the anemometer spins. The faster it turns, the stronger the wind is blowing.
4. Call students attention to the sky and note if there are clouds in the sky. Ask the students to identify the types of clouds they see. Next ask the students if the clouds are moving or not? If the clouds are moving, what causes them to move? (wind)
5. Pass out thermometers, science notebooks and pencils and have the students record today's weather in their science notebooks.
6. Collect the thermometers and return to the group area in the classroom. Discuss weather observations. Share a copy of the Beaufort Scale and explain how meteorologists use the scale to estimate wind speed. This wind scale was developed in 1805 by Sir Francis Beaufort of England. Create a simple class wind scale the students can use. Example: 0-No wind, 1- Light Breeze, 2-Moderate Breeze and 3-Strong breeze.
<http://www.spc.noaa.gov/faq/tornado/beaufort.htm/>
7. Discuss the class wind scale and ask the students to add today's wind scale speed to their science notebooks.
8. Have the students draw a line under their weather observations and draw a sketch of an anemometer and describe how to use it to measure the actual wind speed.
9. Read a section from a nonfiction selection about the wind or anemometers and discuss. The Delta Science Reader *Weather*

Instruments has a useful section titled “How Do We Measure the Wind?” (see additional resources)

Extension:

Have the students monitor and record the weather for one month, including the condition of the sky, air temperature, wind speed, cloud types and amount of rainfall. At the end of the month, divide the students into small groups, assign each group an aspect of the weather to graph (air temperature, wind speed, cloud types). Note: skip the amount of rainfall if there wasn't any during the month or have the students who graph cloud types also graph rainfall. Repeat throughout the school year and compare weather throughout the seasons.

Vocabulary:

Weather Instruments Delta Science Reader www.deltaeducation.com

Anemometer-instrument used to measure wind speed

Atmosphere-layer of air surrounding earth

Cirrus cloud-thin feathery cloud made of ice crystals

Cloud-mass of tiny water droplets or ice particles in the air

Cumulus cloud-puffy cloud

Meteorologist-scientist who studies the weather

Rain gauge-instrument used to measure the amount of rain

Stratus cloud-low, layered cloud

Temperature-measure of the amount of heat energy in a substance

Weather-state of the atmosphere at a certain place and time

Wind-moving air

Additional Resources

Our Sun, Our Weather (Big book) www.newbridgeonline.com

Energy from the Sun (Big book) ISBN # 0-7608-9711-5 Sundance

Weather Instruments ISBN 1-59242-260-8 Delta Science Readers
www.deltaeducation.com

Weather Watching ISBN1-59242-255-1 www.deltaeducation.com

Nevada State Standards

N2A1 Students know how to make observations and give descriptions using words, numbers, and drawings. E/S

N2A2 Students know tools can be used safely to gather data and extend the senses. I/L

N2A3 Students know observable patterns can be used to predict future events or sort items. E/S

E2A1 Students know the Sun is a source of heat and light. E/S

E2A3 Students know weather changes from day to day and seasonally. I/L

E2A4 Students know weather can be described by measurable quantities such as temperature, wind direction and speed, and precipitation.

N2B1 Students know science engages men and women of all ages and backgrounds. E/S

Safety Reminder:

Do not use mercury thermometers. Instruct the students to never look directly at the Sun because it can be harmful to their eyes.