



Lesson: Outdoor Weather Lab

Duration: *Two (2) 40-minute sessions*

Note: *This lesson involves activity segments that are intended to be implemented in an outdoor setting. Where applicable, the title of the activity will be followed by “(outdoors)”.*

Section 1: Framework

Essential Questions

- What is weather and how is it measured and recorded?
- Why do we collect weather data?
- What patterns emerge when we study weather data?
- How are living organisms affected by weather?
- How do living organisms adapt to the weather?

Lesson Objectives

- Students will predict weather conditions; after reviewing historical data and considering their personal experiences with weather variables (temperature, wind, humidity, etc.), students will make an informed prediction of the weather outside
- Students will measure and record temperature using a thermometer (°F)
- Students will use descriptive words and phrases to observe and record their weather observations
- Students will understand that weather has an impact on humans, plant life, and the environment; all living organisms’ ability to survive, grow, and reproduce is conditional on certain weather conditions
- Students will observe and predict ways that farmers and growers can help plants survive particularly harsh weather conditions

Context

Do you ever consider how the weather changes or how similar the weather is during particular times of the year? Have you noticed patterns to how hot or cold it is in certain months of the year; or have you noticed how certain fruits or vegetables are available “seasonally”, or during certain seasons of the year? In this lesson, students

will observe, describe, and record local weather data, improving their skills of observation, prediction, and measurement.

Standards

PRIMARY

Massachusetts Grade 3 Earth Science Standard 3.ESS.2.1: Use graphs and tables of local weather data to describe and predict typical weather during a particular season in an area.

RELATED

Massachusetts Grade 3 Life Science Standard 3.LS.4.4: Analyze and interpret given data about changes in a habitat and describe how the changes affect the ability of organisms that live in that habitat to survive and reproduce.

Materials

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| 📎 Loose leaf paper and/or notebook | 📎 Handout: Historical Weather Data, New Bedford MA |
| 📎 Pen or pencil | |
| 📎 Handout: Word Web - Weather | 📎 Handout: Weather Observation Table |
| 📎 Thermometer (°F) | 📎 Clipboard (optional) |

Section 2: Activities

This lesson has been designed to bridge students' study of weather with practice in measurement and first-hand observations of weather. Given that grade 3 students are unlikely to have extensive experience reviewing data, the core activities for this lesson have been broken up into two 40-minute lessons to allow adequate time for both data analysis/prediction as well as time outdoors.

1. Activator: What is weather? (10 minutes)

Activate students' mental frameworks by making a web around the concept *weather* (see accompanying materials). What comes to mind when we think of the word weather? Through this brainstorming activity, students have the opportunity to articulate their level of understanding of *weather* and its association with key words, including: temperature, wind, humidity, air pressure, etc.

2. Evaluate Historical Weather Data (30 minutes)

Reflect and discuss. Ask students to try to recall the weather on their way to school this morning. How might they describe the weather? Were they wearing a jacket? Carrying an umbrella? Utilize this moment to begin associating descriptive words with particular weather conditions.

Data review. Next, share local weather data with students. Data should be presented in pictograph or bar graph form and may include temperature, amount

and type of precipitation (rain, snow, etc.), wind direction, and wind speed. Take a few moments to ensure that students are capable of reading and interpreting data accurately.

Reflect and discuss. What is the typical weather this time of year? What does *typical* mean and how do we find it when we are given multiple data points? Imagine that a relative is coming to visit and needs to know what type of clothes and accessories to pack. What should they pack? A jacket? A sweatshirt? A hat? Umbrella? Rain boots? You might ask students to finish the sentence, “Typically, the weather this time of year is ___”; this activity may help students synthesize what they understand about weather in a more coherent form.

3. Predict: What is the weather right now? (10 minutes)

Predict and discuss. In the next activity, students will venture outdoors to measure the temperature and make other weather observations. Before they do that, let’s see if they can accurately predict the weather. Ask students, working in pairs or in groups, to predict the weather. Encourage students to consider typical weather for this time of year, based on available data, as well as their own observations and experiences: Is it so windy out that flags are flying in the wind or are they hanging down alongside the flagpole? Did they wish they had a jacket this morning or was it t-shirt weather? Was the air hot and sticky? Was it dry?

Record students’ predictions. Before heading outdoors, record students’ predictions. Recording predictions ahead of time enables students to later calibrate these against their findings. Do students overestimate any data? Do they underestimate data? Are there students who are spot-on in their estimation?

4. Measuring and Observing Weather (outdoors) (20 minutes)

Take a temperature reading. First, ensure that students have the supplies they need: a weather observation table, thermometer, and something to write with. Next, ask students to measure temperature. Ensure that students are taking measurements in locations where they can get the truest readings (not in full shade, away from asphalt and other conducting or heat-retentive surfaces, etc.). Once students have an accurate temperature reading, instruct them to make a recording for temperature in their weather observation table.

Weather observations. (If you have instruments to take measurements of other weather variables, now is a great time to use them!). If you do not have the instruments required to accurately measure wind speed, direction, precipitation, or humidity, make observations of these weather conditions and record findings using descriptors, numbers, or symbols in the weather observation table. For example, is it raining? Does the air feel dry? Is there a light breeze? A strong wind? Touching the soil in the garden, is it dry and crumbly? Does it feel damp or does your finger leave

an impression in the soil? Even without sophisticated instruments, students have the ability to observe and denote the weather that they see and experience.

5. Describing Weather (5 minutes)

Consider and discuss. In pairs or small groups, ask students to think about how they would describe the weather at this moment. How might they talk about the weather? For example, what would they say if a parent or a friend asked what the weather was like today? Encourage students to partner for a half-minute and share. Next, consider: is this weather typical for this time of year? Why or why not?

6. Reflect (10 minutes)

Reflect and share. How accurate were the class' predictions? What are some of the reasons that our predictions were different from our observations and measurements of temperature? Connecting changes in weather to rhythms of plant and animal life, what types of changes can we observe in plant and animal life, as a result of typical weather conditions? For instance, can we observe birds migrating in search of warmth and food? What plants are still growing in the garden? What plants don't we see this time of year? What other observations can we make that are the result of changing weather?

7. Predict and Close (5 minutes)

Predict and discuss. Today's climate is changing rapidly as the result of human activity, producing more extreme temperatures and natural phenomena, like storms, earthquakes, and drought. Predict: what do plants need to survive, and how might plants adapt to survive changes in weather? How might humans intervene in the environment to support healthy plant life and the environment in times of extreme weather conditions?

Section 3: Lesson Extensions

- Have time to travel outdoors each day? Consider having students track the weather using observation tables. With these tables, students can accurately create graphs that show trends and describe "typical" weather conditions, informed by their own research.
- Want to get crafty? Consider having students make their own wind meters (anemometers) or water gauges using basic craft supplies.