

TRACKING WEATHER CHANGES

IN THE GARDEN

Vocabulary: sunrise, sunset, temperature, thermometer

Description

Students collect sunrise and sunset times, daily temperature highs and lows, make observations and predictions about the weather and length of the day. This activity teaches students to observe and collect data about environmental changes in the garden and connect these observations to growing food. This lesson works well during February-April, the months before and after the spring equinox, when winter turns into spring.

Guiding Question

How do weather changes effect the school garden?

Big Idea

Changes in the environment influence living and non-living things.



SECOND GRADE

Learning Objectives

At the end of this lesson, students will be able to:
Collect weather data and read thermometers.
Make predictions about changes in the weather and length of day.
Explain how day length, temperature, and weather affect the garden.

Materials

Internet or daily newspaper for collecting weather and sunrise and sunset data.
Monthly Weather Recording Chart (attached), one copy for each month you will collect data, or multiple copies if students will collect data in groups or as a class.
Optional: Enlarge a copy of the chart to help students learn how to complete it.
One or more clipboards and pencils for data collection.
Air thermometer, mounted in a protected space near the garden. (Optional, a thermometer that records the 24 hour high and low)
Optional: Soil thermometer.

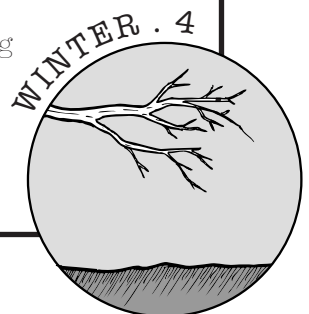
Preparation

Plan and make decisions about the lesson: Decide how often you want students to collect data; daily, once or twice a week, or bi-weekly. Choose a consistent time of day to collect field data. Plan excursions to the garden; Will they take place in small groups or with the entire class? Select volunteers: This could be an opportunity for older students in the school, such as fifth graders, to serve as data collection buddies or guides for second graders, or you may want to recruit adult volunteers. Gather materials – Choose a source for sunrise/sunset data, such as the Old Farmer's Almanac at www.almanac.com or the local newspaper; place thermometers if needed, make copies of (and optionally, enlarge) the Monthly Weather Recording Chart (attached); (optional, print and copy thermometer reading practice sheets) Recruit and train volunteers, whether adult or older students, to take small groups of students to the garden daily.

Additional time: Several hours, divided:

Approximately 60 minutes of introduction, which can be split among several sessions. About 15 minutes of data collection daily, for one to three months, ideally February, March, and April. About 30 minutes of data evaluation and discussion.

Lesson time: see additional time



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Introducing the Lesson

1. *Engage student interest.* If time and access permit, read the *Cat in the Hat* book, *Oh Say Can You Say What the Weather is Today?* by Trish Rabe and Aristide Ruiz (2004, Random House Books for Young Readers) or a similarly entertaining book about weather.

2. *Activate background knowledge.* After reading the books, discuss what students know about weather. Determine their knowledge of terms introduced in this lesson, such as *temperature*, as well as their level of understanding of the role of the sun in influencing weather, and the effects of weather on plants and animals in the garden. Then, tell students that they will become like the meteorologist in the book you read, and collect information about the weather in the school garden every day for several weeks.

Procedure

1. *Introduce data collection tools:*

- *Newspaper or internet.* In the classroom, show students how to go to the web site you have chosen to find sunrise and sunset times, or how to locate them in the newspaper.
- *Thermometers.* Take students outside to show them where the air and soil thermometers are located. Describe how to read the thermometers. You may want to provide additional thermometer practice in the classroom. (For example, a free practice thermometer worksheet is available at <http://www.superteacherworksheets.com/measurement-temperature.html>.)
- *Outdoor observations.* Outdoors in the garden, model making general observations about the weather and garden conditions. Encourage students to notice if the weather is rainy, sunny, dry, cloudy, windy etc. Show them how to gauge the position of sun in the sky on clear day, relative to constant object like a tree, building, or piece of playground equipment. Think aloud as you make observations about life in the garden, such as when plants show new growth or frozen leaves, or the visibility and activities of animals (birds, mason bees, worms). Remind students to ask themselves: *What is happening in the garden today? What is different today from last (time)? What do I hear? What do I smell? What do I see?*

2. *Explain data recording.* Place a copy of the monthly weather recording chart on a clipboard, and attach a pencil. Show students where the clipboard will be kept, and explain your method for taking turns (or going as a class) to collect weather data. You may want to use an enlarged copy of the chart to teach students how to fill it in when it is their turn to collect data.

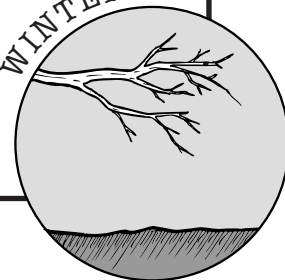
3. *Make predictions.* Show students the calendar and explain how long they will be collecting data about the weather in the garden. If necessary, review the seasons and when they happen. If you have time and students are interested, you can introduce students to seasonal milestones of day length, such as the winter solstice (the shortest day of the year, approximately December 21 every year) and the spring equinox (when day and night are equally long, approximately March 21 every year). Invite students to predict what the weather will be like and how it will change during the time they are observing it. Record predictions to revisit them later.



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Lesson time: see additional time

WINTER . 4



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4. *Collect data.* At the intervals you have selected (every day, once or twice a week, or every two weeks), have small groups of students led by volunteers, or the entire class under your leadership, take the clipboard with the recording chart into the garden, read thermometers and make general weather observations, and record those data in the chart. Student should also find the sunrise and sunset times, using the source you have chosen and add those times to the chart.

5. *Examine and evaluate data.* After you have collected data for several weeks, gather the class to look over your results. (You may wish to provide graphs of temperature trends, or have older students prepare them, as suggested in the extensions.) Help students learn to calculate the length of days using sunrise and sunset information. Ask them if they notice any trends in the lengths of the days. (At any point after the winter solstice, approximately December 21, they should notice the days getting longer). Help them to determine if there are trends in the air and soil temperatures, and if so, if they are related to the lengths of the days? Investigate and discuss other possible patterns, and compare your actual data to the students' earlier predictions. Ask questions such as: How are temperatures different on sunny and cloudy days? On what kinds of days did we see the most birds and animals? (Note that you may see the most worms when it rains.) What about the plants? What do you know about plants and animals in the winter? What seems to be happening to the plants as spring gets closer?

In what ways do plants and animals respond to changes in the environment? What do you know about the garden in winter that you did not know before? What else do you want to know?

Assessing student knowledge

Informally assess students' ability to use data sources by observing them as they learn how to read thermometers, observe weather, and find sunrise/sunset times and during the data collection period. Evaluate their ability to record data by frequently checking the Monthly Weather Recording Chart, and correcting any misunderstandings about filling it in. Use class discussion of results to informally assess students' ability to predict and explain weather changes as they do so in class.

Extensions

- Coordinate with other teachers to include all second-grade classrooms in collection, recording, and display of weather data.
- Transfer data sheets to fourth and fifth grade classes for math graphing exercises. Have older students show and explain their their graphs to second grade students.
- Continue the weather collection throughout the year, perhaps sharing the work with other classrooms.



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Lesson time: see additional time



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Books & Resources

Old [Farmers Almanac](#)

Books:

Energy From the Sun, by Allan Fowler (1998, Children's Press)

Looking at Weather and Seasons: How Do They Change? by Angela Royston (2008, Enslow Elementary)

I Wonder Why the Sun Rises, by Brenda Walpole (2011, Kingfisher)

The Sun and the Wind, by Mairi McKinnon (2008, Usborne Books)

Sun Up, Sun Down: The Story of Day and Night, by Jaqui Bailey (2006, Picture Window Books)

Sunshine Makes the Seasons, by Franklin M. Branley (2005, Collins)

There are many weather web sites for children, including the following:

Weather Wizkids <http://www.weatherwizkids.com/>

Web Weather for Kids <http://eo.ucar.edu/webweather/>, from the University Corporation for Atmospheric Research

Weather for Kids! <http://www.crh.noaa.gov/gid/?n=weatherforkids> from the National Weather Service

The Weather Channel Kids <http://theweatherchannelkids.com/>



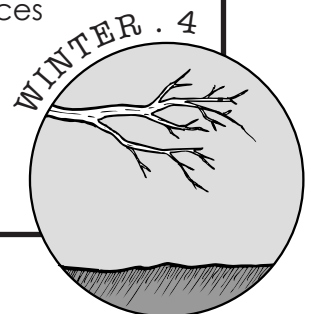
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OR. Dept. of Ed. Key Standards

2.3S.1 Observe, measure, and record properties of objects and substances using simple tools to gather data and extend the senses.

2.3S.2 Make predictions about living and non-living things and events in the environment based on observed patterns.



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Portland Partners for School Food and Garden Education

MONTHLY WEATHER RECORDING CHART

Date	Sunrise	Sunset	Air Temp.	Soil Temp.	Observations: plant & animal life, cloud cover, etc.



SECOND GRADE

