

This is a year-long segment of students learning about plants, animals, and weather as they observe the changes through the seasons of the year.

Student Science Performance

Grade or course: First Grade Life Science

Title

**Topic: Basic Needs of Plants and Animals,
Weather and Seasons**

Plants and Animals through the Year

Performance Expectation for GSE:

S1L1. Obtain, evaluate, and communicate information about the basic needs of plants and animals.

- a. Develop models to identify the parts of a plant -- root, stem, leaf, and flower.
- b. Ask questions to compare and contrast the basic needs of plants (air, water, light, and nutrients) and animals (air, water, food, and shelter).
- c. Design a solution to ensure that a plant or animal has all of its needs met.

S1E1. Obtain, evaluate, and communicate weather data to identify weather patterns.

- a. Represent data in tables and/or graphs to identify and describe different types of weather and the characteristics of each type.
- b. Ask questions to identify forms of precipitation such as rain, sleet, and hailstones as either solid (ice) or liquid (water).
- c. Plan and carry out investigations in current weather conditions by observing, measuring, with simple weather instruments (thermometer, wind vane, rain gauge), and recording weather data (temperature, precipitation, sky condition, and weather events) in a periodic journal, on a calendar, and graphically).
- d. Analyze data to identify seasonal patterns of change.

(Clarification Statement: Examples could include temperature, rainfall/snowfall, and changes to the environment.)

Performance Expectations for Instruction:

The students will

- compare and contrast the basic needs of plants (air, water, light, and nutrients) and animals (air, water, food, and shelter).
- make a plan to help a plant and or animal meet its needs (providing water, shelter, light, food, etc.)
- choose a particular plant and observe how it changes through the seasons.
- observe how various animals and plants respond to seasonal changes.
- record their observations in a variety of formats.
- use simple weather instruments to collect weather data.
- compile weather data in a graph, on a calendar, and/or in a journal.

[Additional notes on student supports](#)

Materials:

Make a Wind Finder: 1 pencil with eraser, a paper cup, a straight pin, a straw, a paper clip, tag board

Simple Weather Instruments: thermometer, wind vane, rain gauge

Recording Data: journals, class calendar, graphing materials

Season and weather observations: Calendar, journal, digital cameras for recording observations

Living plants in the classroom and animals such as a class pet add to the experiences for the first grade student. The students can monitor the needs of the plants and animal to see what is necessary to help them thrive.

Students will continuously obtain, evaluate, and communicate information. This is not a linear process. Students will communicate through writing and discussions to allow for formative assessment. This benefits the teacher, student, and whole group to guide instruction to clarify misconceptions or extend content.

Engaging Learners

Phenomenon: How trees change throughout the seasons

Consider showing a time lapse video of a tree changing through the seasons. For Example - [Time Lapse video of Trees through a Year in 40 Seconds](#)
 If possible, “adopt” a particular tree in the school yard and photograph it to show how it changes throughout the year.
 Ask: What are the parts of a plant? Where are these parts on a tree?
 Have students draw a picture of a plant or tree labeling the stem (trunk and branches of a tree), leaves, flowers, and roots. Have students tell what each one does so the plant can meet its needs.

Obtaining
 Find books that represent each season such as a book about animals in the fall [Animals in Fall: Preparing for Winter](#) by Martha Rustad, or [Animals in the Fall](#) by Gail Saunders-Smith.

Evaluating
 Students sort into two categories what plants and animals need and do not need to live. (See handout [What do they need to live?](#))
 Possible discussion questions:

- Why do plants and animals need air to live?
- How are plants and animals affected by different temperatures during the year? (cold or hot)
- How do plants and animals respond to the different seasonal weather we have? (summer, fall, winter, spring) Why?
- What happens to plants and animals when weather changes? How are the needs of plants met? How are the needs of animals met? What happens if they do not have those needs met? What could you do to help?
- What happens to plants and animals when seasons change? How are the needs of plants met? How are the needs of animals met? What happens if they do not have those needs met? What could you do to help?

Discussion with students:
Do plants and animals do anything else different when the seasons change? Do they go to the store and buy new coats in the winter? No! What have you noticed about the trees outside? (They change when the seasons change. Refer to the video and have students note how the leaves change colors, fall, bud, turn green, and blossoms appear and fall away.)

For example, have students collect leaves at home or on the school grounds and make leaf rubbings noticing the colors, sizes, and numbers of the leaves through the year.
 Ask: *Are there trees that do not lose their leaves? Evergreen trees are called that because they may lose a few needles during the year, but they don't lose all of their leaves the way some trees do.*
 Another option is to have students take photographs of leaves during the season and keep a class chart of questions about leaves for students to research.

Students will discuss what plants and animals will need to survive based on the engage activity.

Have students choose a plant such as a tree and an animal such as a pet that students can watch during the year. Have them observe how the plants and animals respond to

differences through the seasons. (Fur gets thicker. Trees have changes in their leaves. Plants with flowers change. We wear different outfits.) Use the idea of the chart [Living through the Seasons](#) to record their thinking. Students can fill out the chart, use large drawing paper, or make a digital journal.

Communicating:

Ask students to list other things that plants and animals may need to live or survive and how the changes in the season could make a difference. (Water sources can flood or dry up. Temperatures can change. Days get longer and shorter during the year. Food sources can change due to season.)

Ask students: *How does weather affect how plants and animals survive? What causes plants to change in the winter? What causes plants to bloom in the spring?*

Have students make plans about what they could do to help a plant or animal if the conditions are not met for the animal or plant to live and thrive.

Tracking Weather: (This will be a year-long activity that students will revisit throughout the year)

Students can track types of weather conditions each season on a calendar for a few weeks month during (fall, winter, spring and start of summer).

Students will track daily weather conditions each day.

[Blank general calendar](#) and [Sample Weather Symbols for Calendar](#)

At the end of the week(s), they will then graph the data on a bar graph (i.e. rainy days, sunny days etc.). Teacher will also introduce types of weather conditions, such as rain, sleet, snow, hail, temperature, sky conditions, or weather events. In addition, introduce types of tools to measure weather conditions (thermometer, wind vane and rain gauges). Teachers can use pictures to introduce these tools for better understanding.

[Sample weather tools pictures](#)

Using the data students will then discuss what will happen to the plants and animals in these weather conditions. For example, it is too cold for some plants to survive, or there was not enough rain for some plants and animals to live.

Teacher Note: *Having a journal or notebook for students to visit throughout the year help remind students of how the weather changed during the year. A classroom calendar is a useful tool to track data. Students can count the number of rainy days, sunny days or snowy days and use mathematical calculations such as*

- *Were there more sunny days or rainy days this month? How many more?*
- *Why do we have less snowy days than sunny days?*
- *How can we show the numbers in a pictograph?*

Exploring

Obtaining

Students can make a wind vane using paper cups, pencils, paper and straws. [Make a Wind Finder](#). Students also enjoy using pinwheels or streamers to see how the moving air affects them.

Allow students to go outside and experiment. Take the wind vane outside and place it in an open area. When the wind blows, observe which direction the arrow points. The arrow will point in the direction the wind is blowing from. So, if the arrow points north, the wind is blowing from the north.

	<p>Students can record data daily on a chart or calendar and determine seasonal changes. Teacher can ask probing questions, such as</p> <ul style="list-style-type: none"> • <i>What happens when it get more windy?</i> • <i>Is the season changing?</i> • <i>What will happen to leaves on the trees?</i> • <i>Ask students what they notice are they track the data on the windy conditions?</i> • <i>What is happening to the temperature is it getting colder or hotter? Why?</i> • <i>How will this weather change affect the plants and animals in the environment?</i> <p><i>Teacher Note: Teacher should explain the different characteristics of weather and identify the forms of precipitation such as rain, sleet, and hailstones as either solid (ice) or liquid (water).</i></p> <p>Have students observe how much precipitation falls by catching it in a plastic soda bottle with the top removed or a cup. They can mark the bottle or cup with the date, empty it and use it for the next event. They can then discuss greater than and less than amounts according to the day the precipitation fell.</p> <p>If you have access to a rain gauge, place it in a prominent location and have students graph the data.</p> <p>Your students can build a rain gauge from an empty soda bottle, funnel and ruler.</p> <p>In order for students to fully explore seasonal changes in plants and animals, have them observe living things in their environment. When it is not possible to take students outdoors, classroom pets and plants in pots or terrariums can represent how plants and animals react to the changes around them. Video and photographs can also help supplement what is available either outdoors or in habitats for pets.</p>
	<p><i>Evaluating</i> Students demonstrate their wind vanes and determine how they can tell if the wind is moving fast or slow. Students will use other weather instruments and determine how they track weather.</p>
	<p><i>Formative Assessment of Student Learning</i> <u><i>Formative Assessment Probe</i></u></p>
<p><i>Explaining</i> Finalizing Model</p>	<p><i>Obtaining</i> Students will use either photographs, video, or real objects to help students think about how animals and plants change throughout the year. Some animals migrate when there are major changes with the seasons so students could show pictures such as birds flying in formation. They might also answer a related question such as: <i>The tree has no leaves in the winter at all. It appears the same day after day. The only change is when the wind blows it or breaks off a branch. Is the tree living or dead?</i></p> <p><i>Evaluating</i> Have the student write captions for the photographs or narration for the video that accurately explains why the object has changed with reason(s) to support the answer,</p> <p><i>Communicating</i> Students can record the precipitation that occurs during each season. Ask students, what types of precipitation happens during each season? Why? When do we get the most rain? When do we see the most clouds or fog? When are the thunderstorms?</p>

	<p>Ask: Does the weather determine the season? Answer: No. The season is determined by certain months of the year. We can have cold weather or warm weather any time during the year.</p> <p>Have students draw pictures of weather that usually happens in each season throughout the year and compile them in a Student Season Scrapbook. Have students to remember to include plants and animals and what they may look like in their pictures.</p>
<p>Elaborating Applying Model to Solve a Problems</p>	<p>Phenomenon Refer to the video clip and real-life experience of watching a tree throughout the various season of the year. (Time Lapse video of Trees through a Year in 40 Seconds)</p> <p>Obtaining Choose a tree or other plant in the school yard to watch as a focal point. Use one or more of these to record information.</p> <ol style="list-style-type: none"> 1. Take photographs, 2. Use a sketchbook and draw various scenes of the same tree. 3. Keep a “Journal of the Seasons” or “My Tree Journal” to record information. <p>Explain to students that weather affects the growth of plants. Ask students what types of precipitation help plants grow? Are all types of precipitation good for plants? Have them explain their thinking.</p> <p>Evaluating Summative assessment may include checking the students’ writing for understanding of the key concepts and terms from this unit. Students are evaluated on their complete depiction of a plant (the tree) and of animals (any animals that live in and around the tree). Examples may include but are not limited to birds, squirrels, butterflies, spiders, etc..</p> <p>Communicating Write about a tree and the animals that call it home. Students may choose between writing a narrative, poem, or rap. Have a section devoted to each of the four seasons. This may be completed a section at a time so that the fall paragraphs, stanzas are written during the fall, the winter part is written during winter, and so on. For examples of poems about trees, do an internet search of poems about trees or read a couple of selections from books such as <u>Poetrees</u>, <u>Trees and Other Poems</u> by Joyce Kilmer, <u>The Giving Tree</u>, <u>Old Elm Speaks</u>, <u>A Coast of Trees</u>, etc.</p>
<p>Evaluation</p>	<p style="text-align: center;">Assessment of Student Learning</p> <p>Use assessment probe as a pre and post tool of evaluation. Review journal/sketchbook, or photographs/captions for understanding of the seasonal changes and how they impact plants and animals. Consider having students build a model of an effective greenhouse using the engineering design challenge process</p>
<p>SEP, CCC, DCI</p>	<p style="text-align: center;">Science Essentials</p>
<p>Science and Engineering Practices</p>	<ul style="list-style-type: none"> ● Develop models ● Ask questions ● Plan and carry out investigations ● Analyzing and interpreting data ● Constructing explanations and designing solutions

<p>Crosscutting Concepts</p>	<ul style="list-style-type: none"> ● Patterns ● Cause and Effect ● Systems and System Models
<p>Disciplinary Core Ideas</p>	<p>LS1.A Structure and Function</p> <ul style="list-style-type: none"> ● Plants have different parts. <p>LS1.B Growth and Development of Organisms</p> <ul style="list-style-type: none"> ● Plants and animals grow and change. <p>LS1.C Organization for Matter and Energy Flow in Organisms</p> <ul style="list-style-type: none"> ● Basic needs of plants and animals <p>LS2.A Interactions, Energy, and Dynamics</p> <p>LS2.B Cycles of Matter and Energy Transfer in Ecosystems</p> <p>LS2.C Ecosystems Dynamics, Functioning, and Resilience</p> <p>ESS2.C The Roles of Water in Earth’s Surface Processes</p> <p>ESS2.D Weather and Climate</p>

Additional Supports for struggling learners:

The following supports are suggestions for this lesson and are not the only options to support students in the classroom. These supports target students that struggle with science material, this lesson or a previous lesson. These are generalized supports and do not take the place of IEP accommodations as required by each student’s Individualized Education Program.

General supports for the following categories:

<u>Reading:</u>	<u>Writing:</u>	<u>Math:</u>
<ol style="list-style-type: none"> 1. The teacher can have students match letters prior to reading to remind them of the alphabet. 2. The teacher can have students identify words that they know in the text as the class reads. 3. The teacher should remind students to use strategies when they are reading. 	<ol style="list-style-type: none"> 1. The teacher can provide practice for students in the area of writing both in context and practicing just letters. 2. The teacher can provide a sentence starter for the students. 3. The teacher should continually give encouragement to the students. 4. The teacher can provide constructive positive feedback during the writing process to help students understand the expectations. 	<ol style="list-style-type: none"> 1. Provide students with opportunities to interact with numbers. 2. The teacher can provide manipulatives to allow the students to count and interact with materials.

Supports for this specific lesson if needed:

Performance expectations for instruction:

1. The teacher should provide information to students in various formats to reach as many students as possible.
2. The students should be given adequate time to complete each part of the lesson.
3. The students should be allowed to express their knowledge in various formats.
4. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material.

Engage:

1. The teacher may need to show the video more than once to ensure that students can make observations.
2. The teacher should be sure to emphasize the way time is moving in the time lapse video compared to time in real life.
3. The teacher should consider providing students with an image of a tree and having students label the

important parts of the tree.

4. Then have the students draw an image that shows the progression of how the tree changed in the time lapse video.
5. The teacher should consider having a book for each season. Then leaving the book out so that students can look at the images in the book to further their understanding of tree changes due to season and weather changes.
6. The teacher should have clear and consistent guidelines for class discussions. These guidelines will help students feel more comfortable and able to participate.
7. The teacher should consider giving a card sort of images of plants and animals in different seasons as a formative assessment of understanding.
8. The teacher should consider having students label images of the different seasons and different types of weather.
9. The teacher should consider linking changes in animals to pets that the students have in their homes. Ask students what changes they notice in their animals as winter approaches? Summer?
10. Then have the students discuss what they see as seasons change.
11. When students are making a list of things needed for animals and plants to survive the teacher can use guiding questions to help students make their list.
12. The teacher can provide students with a calendar to record the weather. The teacher can ask students to record images or create a key of colors to have students record then (i.e. rain= grey, sun=yellow, ect.).
13. The teacher can help students record the weather for several days prior to asking students to record the weather in groups or on their own.
14. The teacher can consider showing a video of all the different types of weather that a student may see.
15. The teacher may need to assist students with the math. It may be beneficial for teachers to provide students with counters to assist with determining how many days display each type of weather.

Exploring:

1. The teacher should be prepared to repeat directions as needed.
2. The teacher should explicitly ask students what makes the pinwheel move. This can lead to a class discussion as needed.
3. The teacher can have students draw what they see as the pinwheel moves and ask students to include how the wind moves.
4. The teacher should consider giving students a data sheet and showing students to collect data in the sheet or having a class data sheet and collecting data as a group.
5. The teacher will need to explicitly teach students to measure how much participation is falling.
6. The teacher should provide graph paper and use modeling and explicit teaching to assist student in graphing the data that they collected.
7. The teacher can consider providing students with an example graph to observe prior to trying to graph their data.
8. Students may need additional time for the assignment.
9. The teacher should be prepared to repeat directions as needed.
10. The teacher should consider using video and images to supplement teaching as students move through the lesson.



11. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material. This could include labeling images, drawing pictures, writing or verbally explaining.

Explaining:

1. The teacher should consider asking students about specific animals that change during the year to survive in the changing seasons.
2. The teacher can provide a card sort for students to identify adaptations that organism have to help them survive the changing seasons.
3. The teacher can provide a text-to-speech program to help students write the captions for the images or videos that have been shown to students.
4. The teacher should provide students with a template for their season scrapbook.
5. Students may need additional time to complete their scrapbook.

Elaborating:

1. The teacher should be prepared to show the time lapse video to students again.
2. The teacher may need to remind students of what a time lapse shows and how time passes differently in real time.
3. The teacher should consider having students observe multiple plants to see how the different plants change.
4. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material. This could include labeling images, drawing pictures, writing or verbally explaining.
5. Students may need additional time to complete the assignment.

Evaluating:

1. Students may need additional time to complete their assignment.
2. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material. This could include labeling images, drawing pictures, writing or verbally explaining.

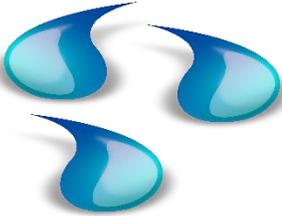
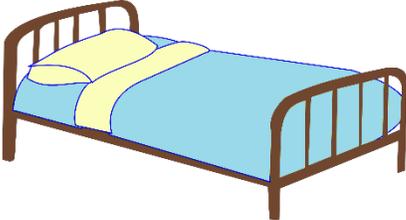


Name _____ Date _____

What do they need to live?

Directions: Students will sort various pictures into the correct category of what a plant or animal need to live.

Need to Live	Does not Need to Live

<p>Sun</p> 	<p>Car</p> 
<p>Air</p> 	<p>Water</p> 
<p>Phone</p> 	<p>Shelter</p> 
<p>Nutrients</p> 	<p>Bed</p> 

[Return to Instructional Segment](#)

Living Through the Seasons

Plants and animals have special ways to meet their needs during the different times of the year.

Fill out the chart showing these changes.

Season	Fall	Winter	Spring	Summer
General Weather				
How a plant changes				
How an animal changes				
How I change				

[Return to Instructional Segment](#)

Month

Year

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Day	Day	Day	Day	Day	Day	Day
Day	Day	Day	Day	Day	Day	Day
Day	Day	Day	Day	Day	Day	Day
Day	Day	Day	Day	Day	Day	Day
Day	Day	Day	Day	Day	Day	Day
Day	Day	Day	Day	Day	Day	Day
Day	Day	Day	Day	Day	Day	Day

Sample Weather symbols for calendar

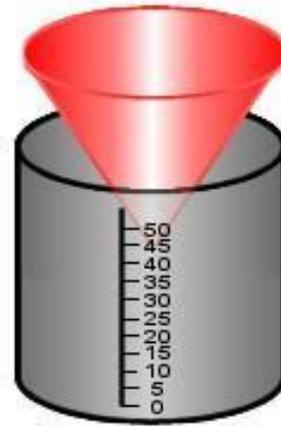
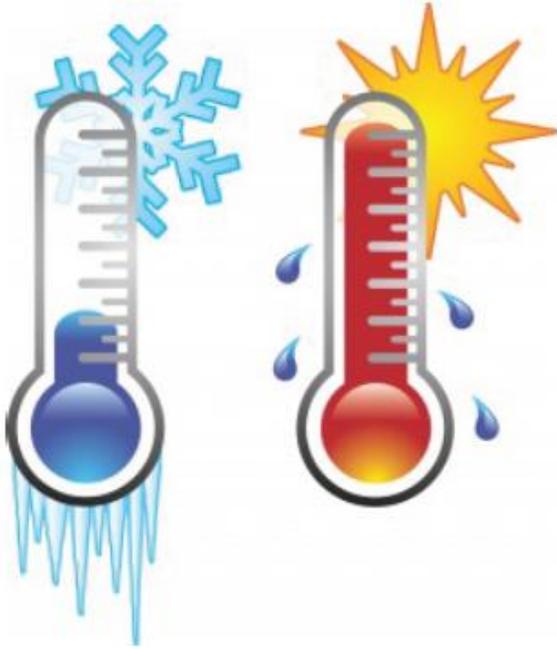


Sample Weather Tool Pictures

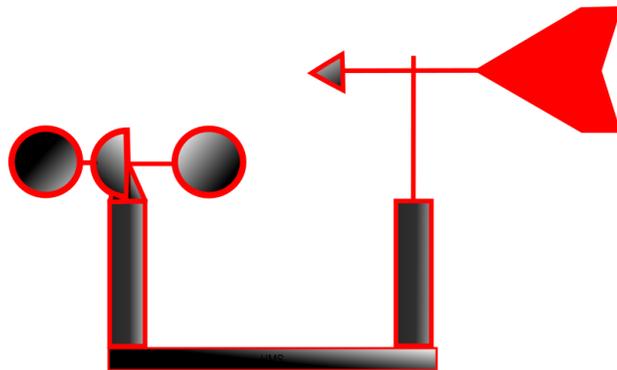
Thermometers measure temperature.

Rain gauges tell how much rain fell.

Use words like cool, cold, warm, and hot.



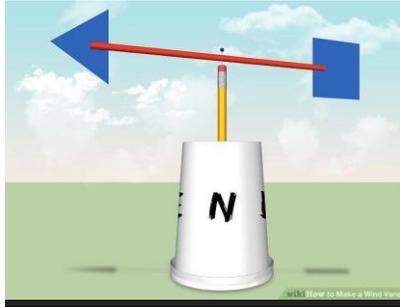
Wind vanes tell wind direction and how strong the wind is blowing.



[Return to Instructional Segment](#)

Make A Wind Finder

Materials: 1 pencil with eraser, a paper cup, a straight pin, a straw, a paper clip, tag board



Activity:

1. Trace and cut out 2 pointers and 2 tails for your wind vane. Decide and experiment with what shapes would be best for your wind vane.
2. Place a paperclip on the end of the straw to give it weight.
3. Push the straight pin through the straw into a pencil eraser.
4. Glue the 2 pointers together on the paper clip end of the straw and glue the 2 tails on the end of the straw.
5. Push the pencil point through the bottom of the cup.
6. Take your wind vane outside and try to find wind direction.

QUESTIONS TO THINK ABOUT:

Which way is the pointer facing when the wind is blowing? into the wind? away from the wind?

Can you tell which direction the wind is blowing? If not, then how can you find out? If yes, how do you know?

How can you tell if the wind is strong or light? What does your wind vane do?

What information does your wind vane tell you? As a meteorologist, how would you record that data?

[Return to Instructional Segment](#)



Formative Assessment Probe

Are the following objects dead or alive? Put a check beside the ones that are alive.

_____ wooden table

_____ a tree in winter with no leaves

_____ a hibernating bear

_____ an artificial plant that always looks green and is always blooming

[Return to Instructional Segment](#)