Bundle Overview LEs1.6-1.8

Bundle 1.B: Our connections to the seasons

This bundle is a continuation of explorations of place from Bundle 1.A with a specific focus on seasons. Seasonal investigation, or **phenology**, is the study of seasonal impacts on plant and animal life cycles - including humans! Learning more about phenology can help us think about complex socio-ecological systems and human relations with the natural world and the decisions we make daily and over time. For K-3 students, the study of phenology serves as a lens through which family and cultural experiences, and Next Generation Science Standards (Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts) can all be investigated. Using a seasonal lens, students can practice everything from observing phenomena to asking questions to analyzing data to communicating information. Phenology has broad applicability; it relates to physical, life, earth and space science, as well as engineering, technology, and other applications of science. Furthermore, phenology can be used to explore crosscutting concepts like scale, patterns and cause and effect. Studying seasonal changes based on students' wonderings provides a path toward engaging all students in both meaningful learning and socioecological deliberation and decision making.

Big Ideas About Nature-Culture Relations To Have In Mind As You Plan For This Bundle of Activities

Phenology is a key idea in studying socio-ecological systems. It is "nature's calendar", and thus affects all aspects of life in the natural world, as well as the human-built world. Two important ideas in phenology are **life cycle** and **synchrony**. Systems work around *cycles of life* (for example, trees blooming, birds hatching, insects emerging) that are *synchronized* with each other. Likewise, humans organize their activity around these cycles in the natural world. For example,we build buildings and roads to account for seasonal changes in temperature, and we plant crops to synchronize plant life cycles with seasonal temperature and rainfall changes. We have family practices that coincide with life cycle changes throughout the seasons,from harvesting practices to what we eat, and how we heat or cool our homes.

With climate change, there is evidence that these cycles are changing, and not all species are changing at the same rate or in the same ways. This affects synchrony, leading to mismatches in timing, for example, when flowers bloom and when pollinators arrive, or between where trees grow and where birds migrate. This has long-term effects on biodiversity, human health and activity, and the overall health of ecosystems. The more we can learn how seasonal changes affect our socio-ecological systems, the better equipped we will be to make ethical decisions related to our own family practices as well as those in the natural world.

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LEARNING GOALS FOR THIS BUNDLE

This bundle incorporates both school and family learning activities to introduce the idea of seasons. By the end of this bundle, learners will be able to:

- Describe the current season using observational evidence from outdoor walks
- Connect seasonal changes to family practices in that season
- Make claims about what season it is based on evidence from both outdoor walks and family practices

CONNECTIONS TO NGSS/ FIELD-BASED SCIENCE

- **Crosscutting Concepts:** Cause and Effect; Scale; Systems and System Models, Stability and Change
- **Science Practices:** Asking questions, Obtaining, Evaluating, and Communicating Information
- **Disciplinary Core Ideas:** ESS3.C: Human Impacts on Earth Systems (K-2)

Learning Engagements in this bundle

- **LE 1.6 Why is This Season Important to us?**: In this activity you will **launch** the idea of seasons through a class discussion, and give students an opportunity to have a discussion about the seasons with their families. This is a **family-based tool** where students and families discuss and share seasonal knowledge and practices, and why these are important to them. This information should be incorporated into classroom activities and discussions throughout the rest of LE 1 and when applicable throughout the storyline. You can use LE 1.8 to help you and students keep track of information you are learning from families about seasons.
- **LE 1.7 How do we know what season we're in?** In this activity students will go on an outdoor walk **at school** to make a claim about what season they think it is and why, and then end with a classroom discussion about what evidence they collected for the season. They will make observations and propose evidence for their claim using their observations. There is also a **Family walk** where families go on a walk together to gather evidence about the current season..
- **1.8 What do We Mean by *Season*?** In this **classroom** activity students will have a chance to reflect on what they already know about seasons, what they can observe directly about seasonal changes in place, and what they are curious or wonder about. This synthesis and reflection activity will be useful later in the storyline when students propose "Should We" questions and investigation questions.

Engaging the Rhizome

Culture, families, and communities: This bundle orients students to their cultural and familial connections to the seasons, and orients families to collecting place-based evidence related to the seasons.

Complex Socio-Ecological Systems: This bundle introduces the idea of seasons and how seasons are related to much of what we observe outside and what we do in our families and communities. We will be using seasonal changes as a way to conduct place-based investigations through the storyline. Like the Histories of Places lessons in Bundle 1.A, It is essential that learners come to understand that socio-ecological systems do not exist in a temporal vacuum, and therefore neither does socio-ecological deliberation and decision making. Seasons are part of all of the timescales in the Histories of Places framework.

Field-based science Learning: It is important in this bundle to begin to emphasize the idea of evidence for claims. As students engage in observations around the seasons, they can begin to back up their claims about what season we are in with evidence from their observations. This will be the foundation for place-based investigations later on in the storyline.

Power and Historicity: Science is often taught from ahistorical, narrow, and decontextualized viewpoints. In contrast, when learner and family ways of knowing and doing are included in the classroom and positioned as equal to the knowing and doing generated in school, it signals to learners and families that family knowledge and practices are important and valued. In addition, research has shown that helping learners make connections among knowledge, ideas, and practices across contexts (home, school, and hobbies, for example) is a critical and powerful learning strategy. When learners see themselves, their families, and the places that are important to them connected to the science they are learning in school, they understand that science is related to their lives and the lives of their communities.

Seasons may at first seem like a simple concept. However, with a simple question of "how do we know what season we are in?", you will begin to see the rich cultural, historical, and ecological knowledge that students and families bring to the learning setting. Seasons are not experienced uniformly across families, cultures, or geographies. They mean more than simply dates on the calendar or celebrating various holidays. Being open to variations in how families and students experience seasons will also open up more possibilities for question asking and "Should We" questions later on in the storyline.

It is natural to be nervous about learners' behavior while outdoors. This might come from concerns about safety while outside, but it often results in policing of children of color (especially black and brown children) more often and more harshly than white children. Students **will** be excited to be outside. Many **will** speak in louder voices than they normally would in the classroom. Many **will** spread out but will come back together as they share their ideas. Allow them both emotional and physical space to do this. Black people especially have historically not felt welcome in outdoor spaces. This is an opportunity to directly refuse anti-blackness while outdoors. For more ideas and practices related to supporting learning outdoors, consult the Supporting Learning Outdoors Framework.

Lesson Plan

LE1.6: Why are seasons important to us?

Purpose

CONNECTING TO EVERYDAY AND FAMILY PRACTICES AROUND SEASONS

In this lesson, you will begin exploring what it means to be in a particular season. Seasonal changes are powerful ways to connect to nature-culture relations, since human activity is closely tied to seasonal changes in life cycles of plants and animals and seasonal weather patterns (temperature, daylight hours, rainfall). In this lesson, you and students will begin exploring the idea of seasons, and in LE 1.7, you and students will collect evidence of seasons.

Why this is important

Reasoning about seasons is an important way students can begin to connect their own activities with seasonal cycles. Scientists also study and make sense of ecological places in terms of seasonal patterns, and studying changes in seasonal patterns is one important way that scientists understand the effects of climate change on global systems.

Engaging family and community knowledge and practices

In this lesson, it is important to connect to students' prior knowledge, experiences and family practices around seasons. For families and communities and cultures more broadly, seasonal changes provide touch points. Every family has stories that map onto the change of seasons, and many people's understandings of nature come, in part, from these stories. When these unique perceptions of nature show up in the classroom, students can engage in more culturally relevant science learning. Families may come from places, speak languages, or identify with cultures that have very different ways of describing seasons and seasonal changes. Make sure you invite these ways of knowing and doing, and create an open space to think broadly about how students and families connect with seasons.

LEARNING GOALS

By the end of this lesson, students will be able to:

1. Describe what they do in different seasons
2. Have discussions with their families about what they do in different seasons and why those things are important to their family
3. Describe decisions they make in different seasons and why

CONNECTIONS TO NGSS

» **Crosscutting Concepts:** Cause and Effect; Scale; Systems and System Models, Stability and Change

» **Science Practices:** Asking questions, Obtaining, Evaluating, and Communicating Information

» **Disciplinary Core Ideas:** ESS3.C: Human Impacts on Earth Systems (K-2)

ASSESSMENT OPPORTUNITIES

» Whole-class discussions

» Family LE1.6 Family tool

Teacher background information

The word "season" can be defined in several ways, from "a time of year marked by changes on earth" (fall, winter, spring, summer) to "a part of the year where we play a certain sport" (soccer season) to "oiling a surface for cooking" (seasoning the cast iron pan). Some of these different meanings may come up in your discussions with your students, and it's important to explore all of these meanings and then explain that this set of lessons will investigate what we do and how we experience the changes on earth across the year.

As you begin this bundle focused on seasons and phenology, you might want to explore the **Phenology Framework** and the National Phenology Network's resources on phenology and its importance in understanding nature-culture relations. As the National Phenology Network (https://www.usanpn.org/) writes: "Phenology is nature's calendar—when cherry trees bloom, when a robin builds its nest and when leaves turn color in the fall. Phenology is a key component of life on earth. Many birds time their nesting so that eggs hatch when insects are available to feed nestlings. Likewise, insect emergence is often synchronized with leaf out in host plants. For people, earlier flowering means earlier allergies. Farmers and gardeners need to know the schedule of plant and insect development to decide when to apply fertilizers and pesticides and when to plant to avoid frosts. Phenology influences the abundance and distribution of organisms, ecosystem services, food webs, and global cycles of water and carbon. In turn, phenology may be altered by changes in temperature and precipitation.

Changes in phenological events like flowering and animal migration are among the most sensitive biological responses to climate change. Across the world, many spring events are occurring earlier—and fall events are happening later—than they did in the past. However, not all species are changing at the same rate or direction, leading to mismatches. How plants and animals respond can help us predict whether their populations will grow or shrink – making phenology a "leading indicator" of climate change impacts.

Centering equitable practices:

- **Broaden what counts as science and science knowledge, who does science, and where science is done:** Do not teach science from narrow conceptions of who does science, what counts as science, or where science is done. This lesson gives you an opportunity to open up the thinking space in science to include students' prior knowledge, family-based knowledge, and expertise as they begin to engage in seasonal investigations.
- **Encourage more-than-human perspective taking. Do not frame ecosystems as solely useful for humans:** In order to engage in ethical deliberation and decision-making about places students need to be supported in taking the perspective of more-than-humans in natural systems. For example, you can ask questions like, "what do the birds do during this season and why?" "what are the trees in our schoolyard doing during this season and why?" "how are flowers getting ready for this season and why?" Beginning to ask these questions will encourage students to take on broader perspectives when engaging in ethical deliberation and decision-making around ecosystems.
- **Encourage human connections to ecosystems:** Do not position humans as disconnected or apart from nature. This lesson encourages thinking about connections between humans and the rest of the natural world in terms of the natural rhythms of the seasons.

To prepare for this lesson

Read through the family tool LE1.6 and think about your own family's practices around the season. Why is this season important to you? What types of activities, practices, traditions, etc. do you and your family do during this season? What feelings do you have in this season and why? What words do you associate with this season and why? What do you do to prepare for this season? What decisions do you make in this season? How do you even know what season it is? What evidence do you use to figure that out?

MATERIALS

» LE1.6 family tool

TIME

45 min

Instructional Sequence

1. Begin the lesson by asking students: what did we learn about place in few lessons? You can remind them about Histories of Places, our family connections to places, what we observed as we walked around the schoolyard, etc.
2. Explain to students that we are beginning a set of lessons that will explore the seasons--what they mean to us and our families, and how we know what season it is from walking outside. Explain that seasons are important parts of places, and we first want to explore what we think seasons are.
3. Ask students: when I say the word "season", what do you think of?
4. Ask students: what season are we in right now? How do you know?
5. Ask students: what do you do in your families during this season? What choices or decisions do you make during this season?
6. Ask students: what do you think the birds are doing during this season? What are the trees doing? What are worms doing?
7. Show LE1.6 on the doc cam and explain to students that they will be having these same discussions with their families using this tool.
8. Allow a few days for the family tools to return. As they come in, you can motivate more students to bring them in by sharing what was returned and saying, "look at all of the amazing things you do around the seasons in your families! I'm sure each of you has a lot of things that you could share. Who would like to volunteer to turn in their family tool next?"

Accept a broad set of answers here. Remember that families experience seasons differently depending on a variety of factors, including culture, language, and geography.

Decision-making will be a key theme throughout the storyline as we engage with "should-we" questions. Starting the practice of thinking about decisions now will set the class up nicely for talking about "Should-We" questions later.

Family tools are a key tool in sharing power with families and students in your learning space. When school knowledge is shared on the same level as family knowledge, students start to see that their expertise, cultures, and families are important in the school learning space.

Explaining **why** we do the things we do in the seasons will start to get at various aspects of seasonal change (temperature change, change in plants/animal life cycles) that we'll explore in the next lesson

As you go over the tool, emphasize that we all make decisions based on the season, and these decisions will become important later on in our investigations!

son important to your family?

Why is this season important to your family?

What season is it in the place we live? _____

In the space below, write down 1 or 2 things that your family does in this season.

What do you do that is special in this season?	Why do you do these things in this season?	Why are these things important to your family?	What decisions do we usually need to make in this season?

1. Think about another place that is important to your family. What season is it right now in that place? In what ways is that place different than where you are now?

2. Look at family pictures of places that are important to your family. What season was it in the different pictures you took? How do you know?

3. Look for pictures of different places online, in magazines, or in books. What season is it in the different pictures you find? How do you know?

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Remember that your families may come from all over the world, or have family members in places all over the world

Why is this current season important to your family?

Family members involved in this activity: _____

Instructions:

Our class is learning about why the seasons are important to people, places, and the rest of the natural world. We would love to have your insights about the seasons..

1. Please talk as a family about why our current season is important to your family. Share things that only happen in this season for your family. These could include events or activities, foods you eat, or anything else that happens in this season that is important to your family.

2. On the back side of this page, write down 1 or 2 things your family does in this season that your child/children can share with our classroom. These will become part of our classroom discussions about what seasons are, how we experience them, and why they are important to us and to the natural world. Please use whatever language you prefer to speak/write in.

3. Discuss the questions below the chart and write down some of your family's ideas.

If you would like to share pictures, videos, or more information with our classroom about what your family does in this current season, please call or email me so that we can figure out the best way for you to share these items with our classroom.

Please fill out the back page of this sheet and return by _____.

Thank you!

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Why is this season important to your family?

What season is it in the place we live? _____

In the space below, write down 1 or 2 things that your family does in this season.

What do we do that is special in this season?	**Why do wedo these things in this season?**	**Why are these things important to ourfamily?**	**What decisions do we usually need to make in this season?**

1. Think about another place that is important to your family. What season is it right now in that place? In what ways is that place different than where you are now?

2. Look at family pictures of places that are important to your family. What season was it in the different pictures you took? How do you know?

3. Look for pictures of different places online, in magazines, or in books. What season is it in the different pictures you find? How do you know?

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Lesson Plan

LE1.7: How do we know what season it is?

Purpose

MAKING OBSERVATIONS ABOUT THE SEASONS

In this lesson, you will begin exploring how we know it is a particular season. Seasonal changes can be subtle, like new leaves being brighter green in color, or very obvious, such as flowers blooming. In this lesson, students will begin to make observations in places around the school in order to eventually make evidence-backed claims about what season we are in. While this might seem like a simple question to explore (what season are we in?), you will find that the types of evidence that your students collect for the season will lead to rich discussions about seasonal changes.

Why this is important

Making observations in outdoor places is a key practice in the Seasonal Storyline for Field-Based Science Education. It is important that students start to understand their observations as important data for making claims. Also, scientists study and make sense of ecological places in terms of seasonal patterns, and studying changes in seasonal patterns is one important way that scientists understand the effects of climate change on global systems.

Engaging family and community knowledge and practices

In this lesson, it is important to connect to students' prior knowledge, experiences and family practices around seasons and the places that are important to them. You can ask questions like "are you noticing anything that reminds you of what you see around your home?" You can also connect observations with what you heard about seasonal family practices in LE1.6. For example, you can ask, "why do you think some families in our class harvest food during this season? What are you observing that helps you answer that question?" Make sure you invite many ways of knowing and doing, and create an open space to make broad connections to student and family knowledge about seasons as you walk outside.

LEARNING GOALS

By the end of this lesson, students will be able to:

1. Make observations outdoors and articulate what they notice.
2. Connect their observations and claims about what seasons we're in.

CONNECTIONS TO NGSS

» **Crosscutting Concepts:** Patterns; Cause and Effect; Scale; Systems and System Models, Stability and Change

» **Science Practices:** Asking questions

» **Disciplinary Core Ideas:** ESS3.C: Human Impacts on Earth Systems (K-2)

ASSESSMENT OPPORTUNITIES

» Whole-class discussions

» Family LE1.7 student tool

» Small group discussions

Teacher background information

Continue to explore the National Phenology Network's resources on phenology and its importance in understanding nature-culture relations (https://www.usanpn.org/) to understand the types of observations you might expect students to make during the walk.

Centering equitable practices:

- **Broaden what counts as science and science knowledge, who does science, and where science is done:** Avoid teaching science from very narrow conceptions of what counts as science, who does science, and where science is done. This lesson gives you an opportunity to open up the thinking space in science to include students' prior knowledge, family-based knowledge, and expertise as they begin to engage in seasonal investigations.
- **Provide equitable access to outdoor learning experiences.** Avoid policing children's minds and bodies while outside. Black and Brown children are often overly disciplined for their behavior, both outside and inside. It is natural to be nervous about students' behavior while outdoors. This might come from concerns about safety while outside, but it often results in policing of children of color more often and more harshly than white children. Students **will** be excited to be outside. They **will** speak in louder voices than they normally would in the classroom. They **will** spread out but will come back together as they share their ideas. Allow them both emotional and physical space to do this.
- **Encourage more-than-human perspective taking:** Avoid describing ecosystems only in terms of how ecosystems are useful for humans. In order to engage in ethical deliberation about places, we need to support students in taking the perspective of more-than-humans in natural systems. For example, you can ask questions like, "what do you notice the birds doing during this season?" "what do you notice the trees in our schoolyard doing during this season?" "how are flowers getting ready for this season?" "Who is interacting with the flowers during this season?" Beginning to ask these questions will encourage students to take on broader perspectives when engaging in ethical deliberation and decision-making around ecosystems.
- **Encourage human connections to ecosystems:** Avoid positioning humans as disconnected or apart-from nature. This activity encourages thinking about connections between humans and the rest of the natural world in terms of the natural rhythms of the seasons.

To prepare for this lesson

- Make sure that you have done some place designing to know where you'll take students on their walk, what you'll draw their attention to, and what questions you'll ask. For more information about how to do place designing and why it is important, consult the Place & Place Designing: Mapping Opportunities to Learn Framework.
- Make sure that, as you prepare for this lesson, you think carefully about how much time to allocate to the lesson launch, outdoor walk, and the lesson closing. It is important that students have time to reflect on their outdoor observations after you get back inside the classroom.

MATERIALS

» LE1.7 student tool

TIME

1 hour

Instructional Sequence

Lesson Launch

1. Remind students: "in our last lesson, we talked about seasons and what we do during the seasons." Invite students to share what they talked about in their families about what their families do in the season and what decisions they make during this season.
2. Remind students: last time, we said we were in [fill in the season that was shared in LE1.6]. We said we knew because [fill in what was shared in the discussion in LE1.6].
3. Explain to students that today, we are going to be going outside to make some observations about the season. We are going to try to gather some evidence for the current season based on what we see outside.
    a. Explain to students: you already have some evidence of the current season based one what you're doing in your homes. That's evidence that it's a certain season. We are going to collect a different kind of evidence, based on what's going on outside.
4. Show student tool LE1.7 on the doc cam to explain what students will record on their sheets. Explain that they will first predict what season it is, and then go outside and record their observations and wonderings on the sheet.
5. Hand out the sheet and allow students some time to write their names and the season on the first page.

Even if you don't have all of the family tools back from LE1.6, you can still ask these questions.

Make sure that you're always coming back to family practices as valid sources of evidence and knowledge.

Outside (25 minutes): supporting place-based observations

6. While you're outside, some questions you can ask to support seasonal sensemaking and nature-culture relations:
    a. "what do you notice the birds doing during this season? Why do you think they might be doing these things?"
    b. "what do you notice the trees in our schoolyard doing during this season? Why do you think they might be doing these things?"
    c. "how are flowers getting ready for this season?"
    d. "Who is interacting with the flowers during this season? Why do you think that interaction is important?"
    e. Do you notice anything here that is also around your house? Or something that is really different from what is happening at your house?

Take the opportunity to both ask about different parts of the system as well as encourage students to sense make from more-than-human perspectives.

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Back in the classroom: connecting to outdoor learning

7. Once you're back in the classroom, have small groups of students share with each other what their observations told them about what season we're in.

8. Explain to students: Because we were working by ourselves and/or in pairs, let's take turns sharing with everyone in the class what each of us, or pairs of us, observed outside that helped convince us of what season it is. We are going to track our sharing using this chart. We are also going to track any parts of our observations (called " variables") that come from our observations that we could track over time (throughout this season and maybe throughout different seasons too). These variables could help us ask investigation questions that we can start to explore.

Accept a broad set of answers here. Remember that families experience seasons differently depending on a variety of factors, including culture, language, and geography.

9. Ask students to share either their individual observations or their group thoughts and keep track of ideas on the following chart, using the questions in the columns to guide your discussion.

Decision-making will be a key theme throughout the storyline as we engage with "should-we" questions. Starting the practice of thinking about decisions now will set the class up nicely for talking about "Should We" questions later.

What did we observe? [can be used as evidence] ["Phenomena"]	**What does the observation tell us about the season and why? [claim and reasoning]**	**Predict: How might our observation be different in another season?**	**Parts of this that we might study ["Variables"]**
Maya and Aden observed fuzzy buds on the tree	It might be spring because trees have buds on them in the spring.	There would be no buds on the tree in winter	Changes in buds on trees over time (e.g., numbers of buds on trees, what buds on trees look like)

10. After the class is done sharing, conclude the lesson by explaining that students will be doing this same walk and reflection activity with their families. Hand out the LE1.7 family tool and explain to students this is the exact same tool that they just finished doing, but it's important to also gather observations from around their homes and neighborhoods with their families so that we can get a complete dataset from our class of both what's around the school and also what's around our neighborhoods.

11. Give some time for the family tools to be returned. When you start to get them back, proceed to LE1.8 to synthesize ideas about seasons and wrap up LE 1 Bundle 1.B.

Encourage students to make observations with all of these senses. Your place designing will be important in leading students to places outdoors where there are rich observations to be made.

These wonderings are very important to both get students in the habit of asking questions but also for you to notice what students are wondering about. Finding pattterns or themes across wonderings will be important as you proceed in the storyline.

LE 1.7 What Season are We In: Observations Student Tool

Now you are going to make some observations in this place. What do you hear? What do you see? What do you smell? What does something feel like if you touch it (make sure it is okay to touch!)?

My observations using my senses In each box, write or draw what you **hear**, what you **touch**, what you **smell**, and what you **see**.		**This makes me wonder about....** Now draw or write **any questions or wonderings** about what you heard, touched, smelled, and saw in this place.
 hearing		
 touch		
 smell		
 sight		
Look back at the season you think it is in this place (page 1). What observations did you make that convince you that it is this season?		

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This lesson gives students opportunities to engage in a few important science and engineering practices: understanding that their observations can be used as evidence for claims, and also looking for seasonal change in many forms.

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Scientist's Name

Date

What is the Current Season?

We want to learn more about seasons in this place. We are going to take a walk and use all of our senses to find *evidence* of the season.

What season do you think it is in this place?

What is the weather during our walk? Circle the picture of the weather (you can circle more than one).






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Now you are going to make some observations in this place. What do you hear? What do you see? What do you smell? What does something feel like if you touch it (make sure it is okay to touch!)?

My observations using my senses In each box, write or draw what you **hear**, what you **touch**, what you **smell**, and what you **see**.		**This makes me wonder about....** Now draw or write **any questions or wonderings** about what you heard, touched, smelled, and saw in this place.
 hearing		
 touch		
 smell		
 sight		
Look back at the season you think it is in this place (page 1). What observations did you make that convince you that it is this season?		

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What season are we in? How do we know?

Activity Purpose:

Our class is studying the question: **What season are we in? How do we know?** In this activity, your family will take a walk to find **evidence** of the current season. You will find evidence by making observations using your five senses. You can use the two-page template provided for this activity, or make your own template on blank sheets of paper, and use it to write and draw observations and questions.

Activity Overview

As a family, decide where you want to go for a walk to look for evidence of the current season.

- Before you take your walk, *make a prediction* about what season you think it is.
- During your walk:
    - Record **observations** that are evidence of the current season (what do you hear, smell, and see for example?).
    - Record **questions** that you have. What do your observations make you wonder about?

What Can You Do To Support Learning?

- The goal of this activity is to think about what evidence your family uses to figure out what season it is. Everyone should offer as many ideas, observations, and questions as they can (instead of there being one "right" answer).
- If someone is having a hard time making observations, you may ask specific questions like, "What are three things you see that tell you it is [season], and why?" and "What do you hear that tells you it is [season], and why?"
- Your family can use the questions and wonderings you come up with to support other activities. For example, if your family has questions and wonderings about something you saw, heard, or smelled, you can use those questions as an opportunity to find and watch related videos or read a related book together.

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What Season are we in?

Take a walk with your family and use your senses to find *evidence* of what season it is right now.

Before you take your walk, make a *prediction* by responding to the following question:
What season do we think it is in this place?

After you make your prediction, go outside and start your walk. First, record the weather.
What is the weather during our walk? Circle the picture of the weather (you can circle more than one).


sunny


sun with clouds


cloudy


rainy


windy


snowy

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Now make some *observations*. What do you hear as you are walking? What do you see? What do you smell? What does something feel like if you touch it (make sure it is okay to touch!)?

Our observations using our senses... In each box, write or draw what you **hear**, what you **touch**, what you **smell**, and what you **see**.		**This makes us wonder about....** Now draw or write **any questions or wonderings** about what you heard, touched, smelled, and saw in this place.
 hearing		
 touch		
 smell		
 sight		
Look back at your prediction about what season it is. What observations did you make that convince you that it is this season you predicted? Or, did your observations convince you that it is another season, and if so, what season do you think it is and why?		

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Learning in Places

Lesson Plan

LE1.8: What does our class mean by season?

Purpose

SYNTHESIZING WHAT WE'VE LEARNED ABOUT SEASONS ACROSS HOME AND SCHOOL

Throughout this bundle, you have been exploring with your students and their families what season means to them, as well as what observations and evidence they can gather about the seasons around the school and neighborhoods. This lesson will give you a chance to synthesize all that you have learned from both family knowledge and from field-based observations into one place.

Why this is important

Seasons are a complex concept that we all experience in different ways, and for which there is diverse evidence when we engage in field-based observations. It is important to take some time to synthesize all of the information gathered across LEs1.6-1.7 to find patterns in the seasonal sensemaking across home and school. This will set you up to go on wondering walks in LE 3.

Engaging family and community knowledge and practices

This lesson gives you an opportunity to put family knowledges alongside classroom knowledge. This allows students to see that their family practices are important and just as valid as classroom-based knowledge.

LEARNING GOALS

By the end of this lesson, students will be able to:

1. Explain that we all experience the seasons in many similar and different ways.
2. Explain why seasons are important to us and to our families, as well as to other plants, animals, and other people.
3. Explain how we can learn more about seasons by observing changes to our places over time.

CONNECTIONS TO NGSS

» **Crosscutting Concepts:** Patterns, Cause and Effect; Scale; Systems and System Models, Stability and Change

» **Science Practices:** Asking questions, Obtaining, Evaluating, and Communicating Information

» **Disciplinary Core Ideas:** ESS3.C: Human Impacts on Earth Systems (K-2)

ASSESSMENT OPPORTUNITIES

» Whole-class discussions

» Filled out Seasonal learning chart

Teacher background information

Throughout this bundle, you have been exploring the concept of "seasons" with your class and their families. You have explored (even if you haven't named) **phenology**, or the cyclical changes of the earth through the seasons. So far, you haven't defined the term "seasons" in any definitive way, because the activities in this bundle were meant to get students and families thinking about their own connections to seasons and finding evidence for the current season.

Centering equitable practices:

- **Broaden what counts as sensemaking:** Do not assume that children and family sense-making will sound like scientist sense-making. That does not mean that their sense-making is not sophisticated and important to consider. Making this problematic assumption is one way that non-dominant students' and families' experiences get discounted in science. Remember that sophisticated reasoning can be found in drawings, descriptions of places, and in seemingly simple phrases and words
- **Encourage more-than-human perspective taking:** Avoid describing ecosystems are often framed only in terms of how ecosystems are useful for humans. In order to engage in ethical deliberation about places, we need to support students in taking the perspective of more-than-humans in natural systems. For example, you can ask questions like, "what do you notice the birds doing during this season?" "what do you notice the trees in our schoolyard doing during this season?" "how are flowers getting ready for this season?" "Who is interacting with the flowers during this season?" Beginning to ask these questions will encourage students to take on broader perspectives when engaging in ethical deliberation and decision-making around ecosystems.
- **Encourage human connections to ecosystems:** Avoid positioning humans as disconnected or apart-from nature. This activity encourages thinking about connections between humans and the rest of the natural world in terms of the natural rhythms of the seasons.

To prepare for this lesson

- Regardless of how many family tools are returned, you can still have this synthesis discussion. You can ask students to recall the discussions they had in their families even if they didn't return the tools.
- Gather the family tools from LE1.6 and the student and family tools from LE1.7, as well as the charts from classroom discussions in LEs 1.6 and 1.7. Look across the family and student practices, observations, and wonderings and record the patterns or themes that you're noticing across the tools. Try to fill out the chart below as a way to prepare for the classroom discussion. This will allow you to fill in information that is not readily shared by students during the discussion.

MATERIALS

» Chart paper

» tools from LE1.6 and LE1.7

TIME

30 min

Instructional Sequence

Lesson Launch

1. Remind students:we have been studying the idea of seasons–both what they mean to our families and what observations we can make of the seasons as we walk around the schoolyard and our neighborhoods.
2. Explain to students:today we are going to share what you talked about and observed with your families. Emphasize that it's totally ok if they have not returned their family tools–they can still share what they know about what their families do in different seasons!
3. Begin by asking students what seasons are important to their families and why, and what they do in different seasons. As students share, emphasize all of the different ways that seasons are important to the families in the class. Ask students: what are some things that you're noticing are the same about how our families experience seasons, and what's different? Why do you think that is?

Emphasize that there are broad and diverse ways that we experience seasons, and that this can be because of where our families are from, the languages we speak, etc.

4. Ask students what they observed with their families about the seasons, or if they remember the observations they made around the school? As students share, emphasize that even though they might live close to the school, they may notice things in their neighborhoods that are different than what they notice around the school, since small changes in the land can affect how the plants grow and what the animals do. Ask students: are there observations that were shared here that are similar to what you observed around your neighborhood? Are there observations that are different? Why do you think that might be?

Students can start to understand even now that the physical geography of their neighborhoods (hills, sidewalks, etc) and the histories of a place can have an affect on how plants and animals grow and interact.

5. Finally, ask what questions they have now about the seasons–accept a wide variety of questions and wonderings here. As you move into LE2, you will continue to collect wonderings and questions, and these will help guide your subsequent work in forming "Should We" questions.

What seasons are important to us and why?	**What do we DO during different seasons? What decisions do we make in this season?**	**What evidence do we have of the season?** (What observations did we make as a class or with our families?)	**Questions we have about the seasons and about how the seasons impact the places we care about**