

Problem Solvers Activity SE 7: The Pattern of Seasons

CHILDREN ARE LEARNING...¹

Science Content:

- Seasons are changes in the weather and temperature throughout the year.
- Seasons have an effect on nature—including humans, animals, and plants. Seasons influence how humans and animals prepare for the weather in each season.
- Seasons unfold in a predictable pattern.

CHILDREN ARE DOING...

Science Practices:

- Make observations
- Observe patterns
- Create and use a model

MATERIALS NEEDED:

Masking tape

24 Index Cards

Optional: Acorn(s)

Handout 1: Season Labels

Handout 2: What Makes a Season?

Handout 3: Squirrel Nest and Nut Images

PREPARATION:

- **For the EXPAND activity:**
 - Make a large X on the floor with masking tape. Each arm of the X should be about 2 feet long. In each space between the arms of the X, tape a label from **Handout 1** to the floor.
 - Make a copy of **Handout 2**. Cut out each card and, if desired, staple or glue to index cards. Stack the cards facedown for the game.

¹ Adapted from the Next Generation Science Standards (kindergarten): <https://www.nextgenscience.org/>

- **For the EXPLORE activity:**

- From **Handout 3**, make one copy of the squirrel nest for each pair of children (2 nests if you are teaching a group of 4 children).
- From **Handout 3**, cut and glue 8 acorns to index cards. Hide the acorn cards in the area of the room where you plan to implement the activity. Depending on the age of children, leave part of the nut image visible so they are easier to find.
- Keep the 9th acorn image aside to show children as you introduce the activity. If it's available, you might choose to show children a real acorn as well.

Activity Instructions

ENGAGE

Gather a group of 4 children at a table or in a circle on the floor. (Note: Groups of 6 children work well if you are teaching 4-year-olds.)

ASK: Today we are going to be Problem Solvers and think about the seasons together. There are four seasons: Winter, spring, summer, and fall. I'd like to hear what you all know about the seasons – what can you tell me?

DISCUSS: Invite the children to share their experiences with and knowledge about the seasons. Additional discussion questions, if needed, are below:

- What season do you think it is right now? What makes you think it's (season name)?
- What do you think of when it's summer? Fall? Winter? Spring?
- What is your favorite season?
- What activities do you do enjoy during the summer? (Fall, winter, spring?)
- Why can't you go sledding in the summer?

SUMMARIZE: Summarize children's reflections. If children have mentioned the following in their comments, highlight themes around:

- weather patterns or temperature as characteristics that distinguish how seasons are different from one another;
- specific seasonal activities (like sledding, raking/jumping into piles of leaves, playing in the snow, planting flowers, going swimming); or
- specific seasonal cultural activities (planting/harvest, holidays, celebrations of the longest/shortest day of the year, etc.)

TEACHER'S TIP:

Conversation about seasons will usually include a lot of weather vocabulary. This will be an opportunity to reinforce vocabulary and concepts explored during the **Weather** unit (Activity 5).

TRANSITION: Today, we are going to explore the different seasons. Let's be Problem Solvers and learn about the seasons together!

EXPAND

INTRODUCE: We just talked about the four seasons. Now we're going to create a model to show the four seasons of the year as a pattern. (*Show children the X on the floor.*) Do you see the X here on the floor? There are 4 sections. Each section has a photo to give us a clue about what season it represents. (*Point to each as you name it.*) Let's look at the four seasons: Winter, spring, summer, and fall. This X shows how seasons form a pattern. A pattern is something that repeats the same way every time, just like the seasons

repeat every year: Winter, spring, summer, and fall. Winter, spring, summer, fall—again. Winter, spring, summer, fall—the same, year after year.

EXPLAIN:

- Let's play a game to describe the seasons. You'll pick a card. You'll look at your card and see what the picture is.
- Each picture is a clue! It shows something that we see or do during one of the seasons.
- Some of the cards will show weather or plants that we see in different seasons.
- Some cards will show activities we might do during different seasons.
- Some cards show the kinds of clothing we might wear in order to prepare for different seasons.
- After you look at the picture on your card, you'll decide where to put it in our model—in the spring, summer, fall or winter season.
- Are you ready to play our Seasons card game?

TRY IT: Give each child a turn to select a card, look at it, and show it to the group. There are 16 cards, so in a group of 4 students, each student will have 4 opportunities to play. If desired, you can reduce the cards to 12 if you have limited time.

SUPPORT: As children select cards, guide their thinking (if needed) by exploring the characteristics of each season. See the table below for ideas.

TEACHER'S TIP:

Of course, seasons look and feel different all around the world!

The seasons in your region may have different characteristics than those listed in the table below. Your region may skip some seasons altogether—if you are based in Hawaii, for example!

It's okay to acknowledge these differences: "It doesn't snow in the winter where live, but it does snow in other places where it gets very cold in the winter."

The key objective of this lesson is understanding the concept of four seasons as a pattern of both weather and changes in the natural world that also require humans to adapt and prepare.

Season	Weather	Plant Life	Clothing
Winter	Cool to Cold Snow	<ul style="list-style-type: none"> • Plants do not grow—they are dormant, which means they stop growing until warmer weather returns • Trees and plants often have no leaves (except pine trees) 	<ul style="list-style-type: none"> • Sweaters, pants, and long-sleeve shirts • Winter jackets • Hats, gloves, and snow pants • Winter boots
Spring	Cool to Warm More rain	<ul style="list-style-type: none"> • Seeds are planted • Plants begin to grow • Leaves sprout on trees • Flowers bud and bloom 	<ul style="list-style-type: none"> • T-shirts • Pants • Light Jacket • Raincoat and umbrella
Summer	Warm to Hot Lots of sun Thunderstorms	<ul style="list-style-type: none"> • Flowers bloom • Plants grow—especially in gardens where we can grow our own food • Many fruits and vegetables are ready to harvest (pick) in the summer—like tomatoes, zucchini, melons, peaches, cherries, strawberries, and beans 	<ul style="list-style-type: none"> • T-shirts • Shorts • Bathing Suits • Sun hats and sunglasses • Sandals

Fall	Warm to Cool	<ul style="list-style-type: none"> • Leaves and flowers start to wither (dry up, get brown) as the weather cools • Some leaves turn color (red, yellow, orange, brown) • Leaves fall off the trees • The last vegetables/fruits are harvested in the fall (like cabbage, cauliflower, broccoli, apples, pumpkins, and cranberries) 	<ul style="list-style-type: none"> • Long-sleeve shirts • Pants • Warm jackets
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Examples of ways to guide children's thinking are below:

- **Nurture observation skills:** Let's use our observation skills. Does that plant look like it's just starting to grow or is it already blooming?
- **Build on children's life experiences:** Let's think about our experiences. Is that an activity you do when it's warm or cold out? Would you do that activity in the summer or fall? When do you wear that kind of clothing—when it's cold or hot?
- **Build on acquired knowledge:** Hmmm, let's think about what we've learned about seasons. In the spring, the weather goes from cool to warm. In the summer, the weather is usually warm or hot. What do you think is the season when you would wear (*clothing name*)?
- **Help children make connections:** We know the seasons have a pattern. In the spring, leaves and flowers start to grow. In the fall, leaves and flowers stop growing and start to wither or get brown. When you look at your card, what is happening to the plant in the picture?
- **Model logical thinking:** Humans and animals need to prepare for each season. What season might have weather where we need to wear (*clothing item*)?

REVIEW: When children have placed all of the cards, review the seasonal pattern once more by inviting children to help you tell the story of what happens in each season using the card images as a prompt. Begin with winter and continue through fall.

REVIEW WITH MOVEMENT: Invite the children to follow you in a circle around the X, starting with winter, and chanting *Winter, Spring, Summer, Fall* as you step into each season.

REVIEW INDEPENDENTLY: Invite each child individually to walk around the X (beginning with winter), chanting the name of each season. If needed, remind children they can use the sorted images as "clues" to each season.

SUMMARIZE: Use the points below:

- We learned there are four seasons: Winter, Spring, Summer, and Fall. Seasons change across the year in a pattern.
- We learned that each season has different weather. Based on the weather, plant life changes across each season—in the spring and summer, plants are growing and blooming. In the fall and winter, their growth slows down and then stops.
- Humans prepare for each season. We wear different clothing to prepare for the weather. We can also do different activities in each season.

EXPLORE

INTRODUCE: We talked about how people prepare for the weather they experience in different seasons. But did you know that animals have to prepare for seasons too? Today, we're going to explore how squirrels prepare for the winter. Have you ever seen a squirrel? Tell me what you know about squirrels. *(Facilitate a conversation about squirrels. Use the sidebar facts to add to the conversation if you wish.)*

ASK: Who remembers what season it is when the weather starts to get cold? (The weather first starts to get cooler in the fall and then gets cold in the winter.) In order to stay warm, squirrels grow a thick fur coat in the fall to prepare for winter.

ASK: Because plants stop growing in the winter, it can be hard for squirrels to find food. What do you think squirrels can do to make sure they have enough food to eat over the winter? *(Explore children's responses.)*

EXPLAIN:

- During the spring and summer, squirrels gather extra nuts, seeds, and other food. Here is a special kind of nut called an acorn. *(Show children the acorn or acorn image.)*
- Squirrels bury the extra nuts and seeds in the area around their nests. They hide this food in different holes –so other animals can't find it.
- Then when it's cold and there is nothing to eat in their environment, squirrels can come back to these places to find their hidden snacks.
- But sometimes squirrels steal each other's nuts! So, squirrels have some pretty smart tricks to keep their nuts safe. For example, sometimes they pretend to hide their nuts in one hole, but then run to another place and bury them in a different hole instead. They also will hide their nuts in hard-to-reach places - like under bushes - in order to protect their food.

EXPLAIN: We're going to pretend to be squirrels preparing for the winter season! Are you ready? Can you flick your tail? Can you scurry like a squirrel? *(After children have moved like squirrels, place them in pairs.)* Here's what our game will be:

- You and your partner will get a picture of a squirrel nest. You can decide where your nest will be and you'll put the picture there.
- Then you will have to look around the room and collect the acorns that I've hidden. Remember that acorns are special nuts that look like this *(show acorn image)*. You and your partner can work together to collect 4 nuts.
- Last, you'll do what squirrels do to prepare for winter: You will hide your nuts again to keep them safe all winter long! Find some good hiding places right near your nest!

FACTS ABOUT SQUIRRELS

1. Squirrels are small animals covered in fur. They are usually gray, brown, or black. Squirrels have bushy tails. In fact, their tail helps them balance when they run along fence-tops, wires, or tree branches.
2. They eat mostly plants—like nuts and seeds. But sometimes, they eat insects or bird eggs.
3. Squirrels are very playful. They often chase each other to prove how strong they are. Squirrels are active during the day and sleep at night, just like us!
4. Squirrels communicate through chirps, barks, and body language— like twitching their tail.
5. Squirrels live in nests they build high in the treetops. Their nests are built from twigs, leaves, and items they find in their environment. Their nest protects them from the weather and from other animals.

STEM TIP

Asking children to collect a specific quantity—like 4 nuts—builds math skills, specifically counting and cardinality. Cardinality is the knowledge that, when counting a group of objects, the last number counted is also the total quantity of that set.

Note that this activity also nurtures self-regulation. Children may be tempted to collect *more* than 4 nuts, and it takes self-control to stop at 4. Be aware that this will be an easier task for some children than others.

TRY IT: Guide children through the three steps of this activity (placing their nest; finding their nuts; and hiding the nuts near their nest). When it's time to clean up, give children a chance to "dig up" their nuts and put them away.

REFLECT

To close the activity, bring the children back together. Use a reflective question/s - like those below - to prompt children's thinking about seasons and what we may find and do during the seasons.

- What did you learn about the pattern of seasons today?
- Tell me about how the seasons are different from each other.
- What do humans do in the different seasons? What do humans wear in the different seasons?
- What did you discover about how squirrels prepare for the winter season?
- What do you think is the most important thing squirrels do to prepare for winter?
- What do you want to share with your grown-ups about the pattern of seasons?

SUMMARIZE: Summarize the children's learning using the key points below:

- The weather changes every season. The winter season is usually cold and plants no longer grow. It can be hard for animals to find food.
- Squirrels prepare for the winter season by gathering extra nuts and seeds and hiding this food in holes they dig near their nests.
- During the winter, they return to these hiding places to get food that they will eat all winter long.
- The seasons happen in a pattern. After winter, the spring season arrives. In the spring, the weather slowly gets warmer, plants start to grow again, and animals can find all the food they need in their environment.

Individualizing the Activity

Make it more challenging:

- In the **Expand** activity, give children an opportunity to draw a picture of themselves doing an activity in each season. Children can dictate their description of the picture to you while you write it on the page. If you make a copy of each child's picture and combine them, each child will have their own Seasons book to take home.
- In the **Expand** activity, you could create two X's on the floor and do the seasonal card-sorting activity as a game for pairs, rather than as a group game. Be sure to supervise as children play to answer questions or correct any misconceptions that arise.
- Following the **Expand** activity, if children are very interested in the way weather and activities change across the seasons, consider sharing books like *Four Seasons Make a Year* by Anne Rockwell or *The Year at Maple Hill Farm* by Alice and Martin Provensen, both of which explore a year of seasonal activities at a farm. A more complex treatment of this concept is *Seasons* by Hannah Pang which explores changing seasons around the world.
- In the **Explore** activity, increase the number of "nuts" you hide in the classroom. Add a math component where a pair of children is assigned a total quantity of nuts to find, like 5. Then the partners need to work together to meet this challenge, for example, with one partner gathering 2 and the other 3. Use this as an opportunity to reinforce skills around early calculations and cardinality.

Make it less challenging:

- In the **Expand** activity, focus on weather and clothing for the different seasons. Emphasize the pattern of the seasons, repeating the group walk/seasons chant around the X you have created on the floor several times. Add shakers or other instruments to make this a fun “Seasons Parade.”
- Consider sharing a simple introduction to the seasons using the board book *Wonderful Seasons* by Emily Winfield Martin to reinforce the concept of a seasonal pattern.
- In the **Explore** activity, find and hide the nuts as a group using only one nest. Talk through each step of the activity while you do it with children.

MAKING CONNECTIONS ACROSS THE DAY:

- When children arrive in the morning, notice and point out how they are dressed/prepared for the weather or season.
- Ask families about any seasonal activities happening in the children’s home or community. Invite families to share these activities or traditions with the class.
- If you do a calendar activity each day, discuss what season it is and how children know (what weather, activities or clothing tell them about the season). During periods of transition between seasons, talk about what season is coming next (and the signs you see) or what season just ended. This type of observation/discussion reinforces the concept that seasons unfold in a predictable pattern.
- Include clothing from different seasons (e.g. scarves, hats, raincoats, sunglasses) in the dramatic play area to support pretend play with a seasons theme.
- Encourage children to build squirrel nests in the block area using blocks and other materials.
- During free play, let children explore the games that were part of this unit.
- If children are interested in squirrel behavior, consider building on that curiosity by creating a checklist of common squirrel behaviors (like Tree Climbing; Limb Leaping; Running Along Branches, Roofs or Fences; Chasing Each Other; Chattering, Flicking Their Tails; Munching). When you are outside or on a community walk, encourage children to notice squirrel behaviors and make a checkmark for each of different behaviors they see. Later, you can share this data chart with children and discover together what the most frequent and least frequent squirrel behavior is in your community. (This type of activity builds observation and data analysis skills.)

Song: Seasons

Directions: Model the movements and call-outs as suggested in the song. Encourage children to listen and move the way you move!

Let's name the seasons; there's four in all
Winter, Spring, Summer, and Fall!

I say snow, you say WINTER! (Call out the word "Winter")
Bears hibernate in the cold, dark winter.
Everybody out there, curl up you little critters! (Crouch or lie down and curl up in a ball;
Curl up into a ball and hibernate! Pretend to sleep)

I say flowers, you say SPRING (Call out the word "Spring")
Listen to the little baby bluebirds sing!
Everybody out there flap your wings. (Flap arms like wings)
Flap flap flap, Fly little birds!

I say sun, you say SUMMER (Call out the word "Summer")
Playing in the heat, nothing could be funner!
Everybody out there, be a big frog jumper! (Jump up and down like frogs)
Jump, jump, jump little frogs!

I say colored leaves, you say FALL (Call out the word "Fall")
Squirrels gather nuts, and they're having a ball!
Everybody out there, shake tails, y'all! (Twist side to side like squirrel tails swishing)
Swish, swish, swish! Shake your tail!

There's a pattern in the seasons – we can name them all:
Winter, Spring, Summer, and Fall. (Say the names of the seasons)
Winter, Spring, Summer, and Fall.
Winter, Spring, Summer, and Fall.

Making Literacy Connections

Share the following book with children as an opportunity to deepen their understanding of seasons. The literacy extension activity below suggests another play-based experience to explore the changing of seasons..

Suggested Book: *A Tree for All Seasons* by Robin Bernard

AS YOU READ:

- Begin by explaining that this book is non-fiction. Non-fiction means that everything in this book is real and tells the truth. Encourage children to raise their hand while you read if they see something in the pictures that they've seen in real life, in their community or at their home.

- On the first page, there are four photos of trees in different seasons. Ask children to share with you how the trees are the same or different. Can they guess what season each tree is in?
- On the page where the author explains what is happening to a tree in the winter, ask children to point to the buds at the tip of the branch. Explain that **buds** are a safe place for new leaves to wait over the winter. The buds protect the leaves from rain, snow, and cold weather.
- Ask children if they have ever tasted maple syrup. What did they put their maple syrup on—pancakes, waffles or something else? Did they like maple syrup?
- On the “spring” page, ask children to look closely at the parent bird. What is the parent feeding the babies in the nest? Parent birds have to bring food to their babies because they don’t yet know how to fly.
- On the page that shows the veins of the leaf, remind children of the early planting and plant observation activities they completed (see Activities 2, 3 and 4). If you still have plants in the classroom, show children the veins on one of its leaves.
- On the page showing the fall leaf colors, ask children which color leaf they like best: Green, red, orange or yellow.
- On the page that shows a squirrel, ask children to tell you what they remember about squirrels preparing for winter (from today’s activity).

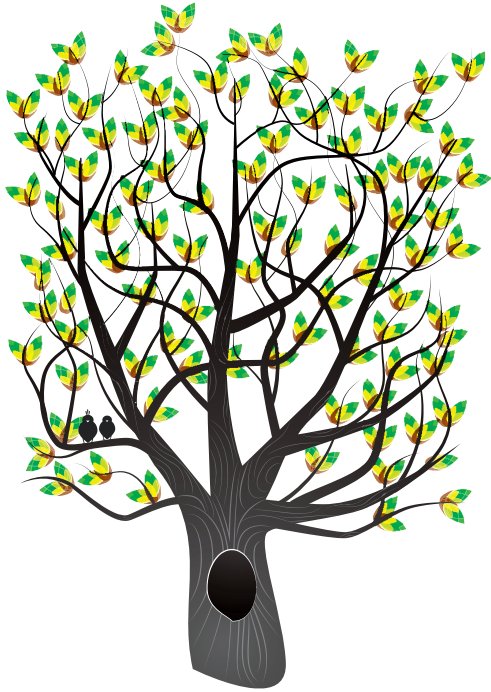
BUILD ON THE BOOK: MAPLE SYRUP TASTE-TEST

Materials: Slices of apples, small jar of maple syrup, plates (1 per child), small spoon, and child-safe, child-sized clear pitcher (optional)

1. Pour some maple syrup into the pitcher. Let children watch you pour: Do they think the maple syrup is thick or thin? Give each child a chance to look at, stir, and smell the syrup in the pitcher.
2. Remind children of the story—how syrup comes from the sap of maple trees. The sap is then boiled until it thickens and gets sweet.
3. Give each child a few slices of apple on a plate. Let each child pour a bit of syrup onto their plate. Demonstrate to show the approximate amount (of course, it’s difficult at this age for children to be precise about pouring!)
4. Let each child decide whether to taste the apple with syrup, or just the syrup, or neither. If children don’t want to try, that’s okay—they can just smell or touch it if they want!
5. If desired, you can create a data chart that shows two columns: “I like it” with a happy face image and “I don’t like it” with a sad face image. You can encourage each child to share their opinion of maple syrup by marking the data chart. Take time to look at and discuss the data after the activity to discover whether more children liked the maple syrup than disliked it (or the opposite).
6. As you close, have a conversation with children about the ways that humans can use resources from the environment, like maple sap. Even though the tree is dormant (not growing) in the winter, humans can still use the sap to make a sweet treat of maple syrup.

Handout 1 – Season Labels

SPRING



SUMMER



FALL



WINTER

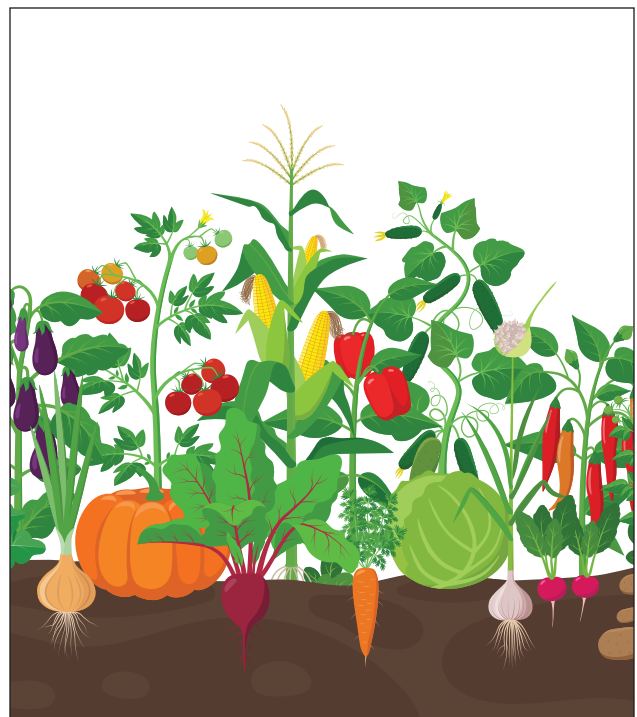
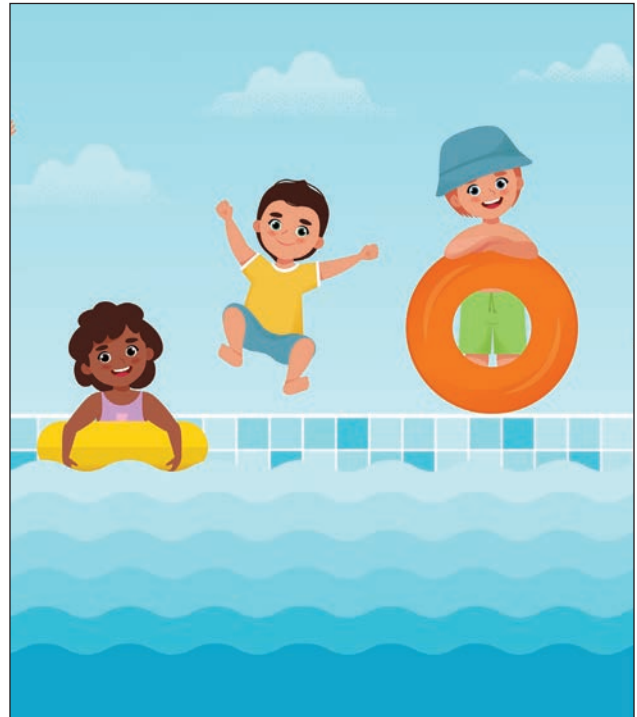


Handout 2 – What Makes a Season?

WINTER CARDS:



SUMMER CARDS::



SPRING CARDS::



FALL CARDS::



Handout 3 – Squirrel Nest and Acorns









What Are the Seasons?

This week, children learned about the seasons: winter, spring, summer and fall. Look for ways to notice and talk about the season with your child. This includes:

- The weather you're experiencing for the current season
- How you and your child dress for the current season
- What activities or celebrations you share during this season.

Here are some ideas to try:

- In the morning when you get ready for the day, open the door or window and ask your child about the weather for the season you're in. How can the two of you prepare for the day's weather with the clothing you choose?
- As you choose activities to share with your child, make the connection to the season you're in. For example, perhaps your family plants seeds during the spring—you can look for ways to include your child. Or in the summer, your family might have a special tradition of running through the sprinkler or going to a local pool.
- Notice how the animals in your community are adapting to the season. In the fall and winter, squirrels may bury nuts to feed themselves during the cold months. In the spring, you may see (or hear) the chirping of baby birds. In the summer, there might be fireflies where you live. Notice these seasonal changes with your child.





Solo para familias

¿Qué son las estaciones?

Los niños aprendieron sobre las estaciones: invierno, primavera, verano y otoño. Esta semana, busque maneras de observar la estación del año y hablar de ella con su niño. Esto incluye:

- Características de la estación actual (frío, calor, lluvia, sequía, nieve)
- Cómo se visten usted y su niño para la estación actual
- Qué actividades o celebraciones comparten durante esta estación.

Estas son algunas ideas que puede probar:

- Por la mañana, cuando se estén preparando para el día, abra la puerta o la ventana y pregúntele a su niño cuál es la temperatura habitual de la estación en la que se encuentran. ¿Cómo pueden prepararse los dos para la temperatura del día con la ropa que elijan?
- Cuando elija actividades para compartir con su niño, establezca una conexión con la estación en la que se encuentran. Por ejemplo, si su familia siembra semillas en la primavera, puede buscar formas de incluir a su niño en esa actividad. O, en el verano, es posible que su familia tenga la tradición especial de jugar con el rociador de agua o de ir a la piscina local.
- Observe cómo se adaptan a la estación los animales de su comunidad. En otoño e invierno, las ardillas entierran nueces para alimentarse durante los meses fríos. En la primavera, puede que oiga el canto de las crías de los pájaros y que los vea. En el verano, quizá haya luciérnagas donde usted vive. Observe estos cambios estacionales con su niño.

