Unit 1: My Ecosystem
Week 1: Berries & Harvest

Guiding Questions

• What do living things need to survive? How do different living things depend on each other?

• What is a berry and what are some local berries where I live?

• Where does my food come from? What food can I harvest and preserve locally?

• How can I interact with the world around me with gratitude and respect?
Introduction

Read the following introduction together with your students as a primer for this week’s lessons. Key words are highlighted - think of these as good weekly vocab or spelling words, ones you could look up to find out more about or look up and learn in the traditional language of your area. Pick and choose ones you might not know or that are challenging to you. You could also pick some of the big ones as fun words-of-the-day to think about a new concept each day of the week.

All living things need certain things to survive: **food** to eat, **water** to drink, and **space** to live in. They get all these things from the world around them: their **ecosystem** or **habitat**. Trees capture sunlight, and air to make sugary food and suck up water from the ground to drink. A moose munches on willow branches in the forest and drinks from a pond. Humans grow food in **gardens**, pick berries on the mountain, and hunt for caribou in the fall. Although in modern times a lot of our food is **shipped** across the globe, coming from far away places, there is still a lot of food we can eat that comes from our **local** ecosystem too.

All over the world, Indigenous and land-based peoples have relied on the foods that can be **hunted**, **harvested**, and **grown** around them for thousands of years. Learning about traditional wild foods as well as **cultivated** foods that people grow in your area is a great way to discover more about your ecosystem you are a part of, the kinds of things that like to grow there, and how they are affected by the seasons.
Introduction, Continued

Especially in northern climates like ours, where bountiful food is only available in the warmer seasons, where your food comes from and when you harvest it is so important. If you don’t pick berries when they appear in the summer, soon they will be gone, or buried under the ice and snow. Likewise, you’d have a hard time planting a garden and harvesting fruits and veggies in the winter. Therefore, it is important to learn what, where, and when to harvest, and how to preserve it for winter. It is also important to learn how to do this respectfully so that the food can grow again next year and for many years in the future.

In the following lessons are fun activities for you to learn all about harvesting foods, especially berries, as well as fall veggies like the ones grown at Calypso Farm. Happy harvesting!

Words to Know
- Food, Water, Space (components of a habitat)
- Ecosystem
- Habitat
- Garden
- Ship (as in to transport)
- Local
- Hunt
- Harvest
- Grow
- Cultivate
- Bountiful
- Preserve
- Respect

For Younger Learners
- Food
- Eat
- Berry
- Grow
- Thank You
Introduction Worksheet

Have students answer the following questions before you start the week to think about what things they already know about food, berries, and harvest, and what questions they have. They can write their answers (here or on a separate piece of paper), draw pictures, or you can talk about them together. It’s okay if students don’t have answers for them yet. That just means they have more questions! Students can fill in more as the week goes along too and you learn more about foods that grow locally in your area.

Foods I know of that grow or live in the wild are:
(Bonus: Circle ones that grow in your ecosystem; underline ones you love to eat.)

Foods I know of that people grow or raise in farms and gardens are:
(Bonus: Circle ones that grow in your ecosystem; underline ones you love to eat.)

Three questions I have about growing and harvesting foods are:
1.
2.
3.

One thing I would like to learn to cook is:
Gather Knowledge

Pick **one resource each** out of each of the following categories (Read, Research, Reflect) and read or explore that topic together with your students, or pick and choose as you wish. Suggestions for more advanced readers are not specifically themed for the week but are nature-themed and can be read and explored more deeply over the whole unit.

**Read**
- *Blueberry Shoe* by Ann Dixon, illustrated by Evon Zerbetz
- *Berry Magic* by Teri Sloat and Betty Huffman, illustrated by Teri Sloat
- *Blueberries for Sal* by Robert McCloskey

For More Advanced Readers
- *The Spiderwick Chronicles* by Tony DiTerlizzi and Holly Black - A fantastical series about adventure and magical natural history, and a great series to inspire kids to explore field guides and keep their own nature journal.

**Research**
- Use the internet or a field guide to research what kind of berries grow in your area - make a list of ones that are edible and any that are poisonous.
- Use the internet or a gardening book to research what kind of fruits and veggies can grow in a garden in your area (some may be similar to what can grow in the wild!) Are there any that surprise you? **Bonus:** visit a local farmer’s market and see how many different kinds of crops people are selling and learn about what they are.

Some Good Resources:
- UAF Cooperative Extension Service resources and fact-sheets about Alaskan food crops and berries: [https://www.uaf.edu/ces/](https://www.uaf.edu/ces/)
- *The Alaska Wild Berry Cookbook* published by Alaska Northwest Books
- *Alaska’s Wild Berries and Berry-Like Fruit* by Verna E. Pratt
- *The Boreal Herbal* by Beverley Gray
Reflect

- Read the list of respectful harvest practices from Elders in the Yukon-Kuskokwim region - located in the introduction of A Guide to Ethnobotany of the Yukon-Kuskokwim Region, downloadable here: https://www.uaf.edu/anlc/resources/yukon_kuskokwim_ethnobotany.php
- Watch or read Robin Wall Kimmerer’s Principles of an Honorable Harvest. Look specifically for the list of practices to follow to respectfully harvest plants.
  Watch: https://www.youtube.com/watch?v=cEm7gbIax0o

Reflection Activity: Think through the following prompt with your students and have them respond with their thoughts through art, writing, or talking together.
Reflection Prompt: After going through these lists of respectful and honorable practices for harvest, think about why they might be important. Do you have any rules or guidelines you have been taught to follow when you are in nature - this could be as simple as not picking a garden tomato that’s not ripe yet or not picking a berry when you don’t know what it is. What are these rules for? What are the rules on these lists for? What is something new off one of these lists that you can do next time you are harvesting something?
Discover

Below are some suggestions for fun science activities that involve berries and food preservation. Pick one, or do both! The Winterberry project is an ongoing science project that you can continue throughout the fall and the food preservation activity is more of a one-time activity. Have fun!

Berries
Be a Berry Scientist!
Learn about and join in on the Winterberry community science project! As described by the project leaders: Winterberry is a citizen science project where University of Alaska Fairbanks scientists and community volunteers investigate how shifting seasons could affect when berries are available to animals and people. They are always excited for new participants!

Winterberry is a hands-on science project you can do in your own neighborhood or favorite local berry patch. When you participate you receive training on how to monitor the type and condition of local “winterberries” - their name for berries like low and highbush cranberries that stay on the bush all winter and provide important food for birds and other animals.

Students gain skills like:
• Berry and plant identification
• Kid-friendly scientific monitoring skills like making a plot and tagging plants
• Scientific observation
• Data collection and basic math (counting, categorizing)

Learn more, contact the scientists, and sign-up to be a berry monitoring team on their website: https://sites.google.com/alaska.edu/winterberry/home?authuser=0
Harvest

Fermentation Experimentation! Make Your Own Sauerkraut!

In this activity you and your students can learn to make your own sauerkraut, and in the process learn the basic biology and chemistry involved in the process of fermentation.

Fermentation is a process in which sugars from food are broken down by little organisms called yeast and bacteria. In the process, the yeast and bacteria produce carbon dioxide gas (bubbles) and alcohol or lactic acid, which preserves the food. People all over the world use fermentation to preserve all sorts of different foods. Fermented cabbage, called saurerkrat (also the basis of making kimchi) is an easy place to start to try fermentation at home! As your cabbage ferments, you’ll get to see the bacteria in action! Below are some resources to get you started, including some helpful tutorials. We suggest starting with the UAF Cooperative Extension Service guide for some good background information about making successful sauerkraut. You can look through these resources with your students or just on your own to get prepped for the activity.

- Use this guide from the UAF Cooperative Extension Service to get started and for helpful recipe guidelines and tips: http://cespubs.uaf.edu/index.php/download_file/1241/

- This video is a great kid-friendly sauerkraut tutorial. It is also a helpful demonstration of helping young children take part in cooking! https://www.youtube.com/watch?v=DgYuGm0XDXU

- Interested in learning more about fermentation? Here is another fun science experiment that demonstrates how yeast ferment sugars and make carbon dioxide at the same time - the process that makes bread rise! https://www.youtube.com/watch?v=FYCICHVT00M
Go berry picking! The perfect family-friendly outdoor activity! Find a good local berry picking site in your area (the best way is usually to ask friends) and gather what you need to go harvest berries - containers to hold them, warm clothes to wear, and snacks and water to take on your adventure. Involve your students in the planning and prep for the day.

In September in Interior Alaska it is nearing in the end of the berry season, but you can probably still find lowbush cranberries and crowberries in alpine or boggy areas and lots of highbush cranberries in the birch forests. Some of them are even better after the first frost. If you’re not familiar with them, both types of cranberries can be made into delicious jams and jellies or your own homemade cranberry sauce.

Be sure to research how to identify the types of berries you’re looking for beforehand or take someone with you who knows what they’re looking for. And always make sure you practice respectful harvesting! If you have a guidebook handy, have students help look up and identify the berries once you find them.

For another fun outdoor activity, if you know someone with a farm or garden, you could also ask to help harvest some of the things they are growing - even if just to learn how to do it. You can have students come up with questions beforehand for the gardener like: What are their favorite things to grow? What is best for keeping for winter?
Both people and other animals alike need lots of food to make it through the winter. Here are some real-world math questions to help students practice their math skills and help them think about just how much space it might take to feed yourself if you were a person or a bear for the colder months.

Below are three word-problem math questions and the information required to figure them out. Adapt these questions for your learners as you see fit, or copy these questions to another worksheet and have them puzzle them out on their own. An example of how you could adapt these questions for a younger learner who has not yet learned multiplication is figuring out some of the constants together like how many total days are in winter, or by making the problems smaller to figure out how many berries a bear might eat in a day or how much space you would need to grow enough vegetables for a week.

There is some space on the next page with the questions where you can work them out yourself and adapt them for your students. Approximate answers we worked out are located at the bottom of the question page.

**Constants:**
- Assume that winter is 6 months long, October-March.
- 1 adult brown bear can eat up to 90 pounds of food a day when it is getting ready for winter. Assume that 30 pounds/day of this is berries and that it is eating this much for 3 months (July, August, & September).
- 1 blueberry or cranberry weighs ~ 0.5 grams or ~0.02 ounces
- 16 ounces = 1 pound
- 1 carrot needs 9 square inches to grow
- 1 cabbage needs 144 square inches to grow
- 1 onion needs 36 square inches to grow
- 144 square inches = 1 square foot
**Counting on Berries**

1. How many individual berries would you have to pick to make one batch of blueberry jam if you need about 1 pound of blueberries for your recipe?

2. How many individual blueberries would 1 adult brown bear have to eat to get ready for winter?

**Garden Harvest**

3. Now thinking about garden vegetables, how much garden space would someone need to grow food if they want to eat 2 carrots, 1 onion, and 1 cabbage every day all winter? Other than the space requirements for each veggie given above, assume vegetables can grow right next to each other. If you get an answer in inches can you convert it to square feet?

*Approximate Answers: 1. 800 berries  2. 2,068,000 berries  3. 36,036 square inches of garden or about 250.25 square feet*
Create

Have students **paint or draw a picture of their dream berry patch or garden.** This could be inspired by one they have visited or be completely from their imagination. You can have them think about some of these questions to get them started: What kinds of foods grow there? Are there animals or people there that like to eat those foods? Is there a water source for this garden or berry patch?

Depending on their age and attention level, have them sketch their idea beforehand on a piece of scratch paper and then use another piece of paper or a canvas for their final draft. Depending also on the attention and interest level of students, this can be a project that is worked on a little at a time throughout the week.

*Material suggestions:*
- Scrap paper for sketches
- A canvas or big piece of paper (big is better, like 9x13 inches)
- Paints (acrylic, watercolor, or tempura) or
- Crayons or colored pencils
Connect

Every culture around the world has traditions and methods for harvesting food and preserving it for later. Hunters dry or freeze their meat, people pick berries to make into jams or jellies, and gardeners and all sorts of people ferment vegetables and other foods to preserve them (and make them taste delicious!).

For this activity, have students choose a culture or region of the world they are interested in learning more about and research the foods eaten by the people of that culture/region and how they prepare (cook) and preserve them (save them for winter or for later). Students can use the worksheet on the next page to guide them, or you can copy these questions onto a sheet where they’re easier to answer.

As an alternative activity (and also good for younger learners who research might be harder for), take the opportunity to gather some local knowledge. Do you know someone who picks berries or grows a vegetable garden? Or someone that cans or smokes fish? Have students call up someone they know (a grandparent, neighbor, friend, teacher, etc.) and learn about a their experience with harvesting or gardening! Below are some prompts that can get students started. Have them write their answers (or write them together) and refer back to them during their “interview.”

-Someone I know who grows or harvests food is...

-Some kinds of foods that they grow or harvest are...

-Three things I am wondering about what they do are...
  1.
  2.
  3.
Connect, Continued

Food Exploration Worksheet

The culture or region of the world I would like to learn more about is:

Some foods that are grown, harvested, or eaten by people of this region or culture are: (Circle any that are harvested from the wild and underline ones that are grown in a farm or garden, or animals raised by people.)

Some ways that they preserve food (save it for later or for winter) are:

One traditional dish or recipe from this region/culture is: (Describe what it is made out of and how it is prepared.)
Nourish

Recipe for Lowbush Cranberry Muffins
Lowbush cranberries, also called lingonberries, are a delicious and tart berry that likes to grow in alpine and tundra areas in the late summer/fall. These muffins are a great way to taste a new berry, as they are sweet and yummy and the berries provide little pops of flavor. Add more berries if you like or try this recipe with different berries like blueberries or currants. If your harvest brought you garden goodies like carrots or zucchini instead of berries, try looking up a muffin recipe that incorporates those yummy ingredients instead. Happy baking! Makes ~12 Muffins

You Will Need

- 3/4 cup lowbush cranberries (other berries will also work)
- 3/4 cup powdered sugar
- 2 cups flour
- 3 teaspoons baking powder
- 1/2 teaspoon salt
- 1/4 cup granulated sugar (white or brown)
- 1 cup milk (non-dairy milk is okay too)
- 1 well-beaten egg
- 4 tablespoons melted butter

Directions

1. Mix cranberries with powdered sugar and let stand while preparing the muffin mixture.
2. Sift remaining dry ingredients together in a separate bowl and mix.
3. Add milk, egg, and melted butter to dry ingredients. Stir together, only until the dry ingredients are moistened. (Be gentle so you don’t mix too much!)
4. Gently fold the sugared cranberries into the muffin batter.
5. Pour the batter into lightly oiled muffin pans, filling each ~2/3 full.
6. Bake at 350 degrees for about 20 minutes or until the muffins tops are springy and a toothpick or knife comes out clean. Enjoy!

This recipe was adapted from a recipe for Lowbush Cranberry Muffins in The Alaska Wild Berry Cookbook.
Reflect and Share

Have students choose and complete one or more of the following prompts for reflecting on this week’s lessons and sharing what they’ve learned. If you like, students can upload and share their projects and reflections with Calypso educators and other learners for feedback and for fun!

Writing and Reflection Prompts

• Write your own story about a berry picking misadventure, real or fiction (made-up). (Think about Blueberries for Sal or Blueberry Shoe for inspiration.)

• Write a comic from the perspective of a berry or other fruit or vegetable being picked (and eaten?!).

• Make a short video of yourself showing how to respectfully harvest berries or other foods and giving some tips to others.

• Draw a picture representing one new thing you learned this week.

Other Ways to Share

• Share the art you made about your dream garden or berry patch. Post a picture of it to the learner’s group for other people to see!

• Share your favorite food recipe with the group. Bonus if it uses local or harvested foods!

• Share a picture of yourself on this week’s outdoor adventure or a picture of where you went or something you saw there.

• Make a cooking show style video of you making this week’s recipe.