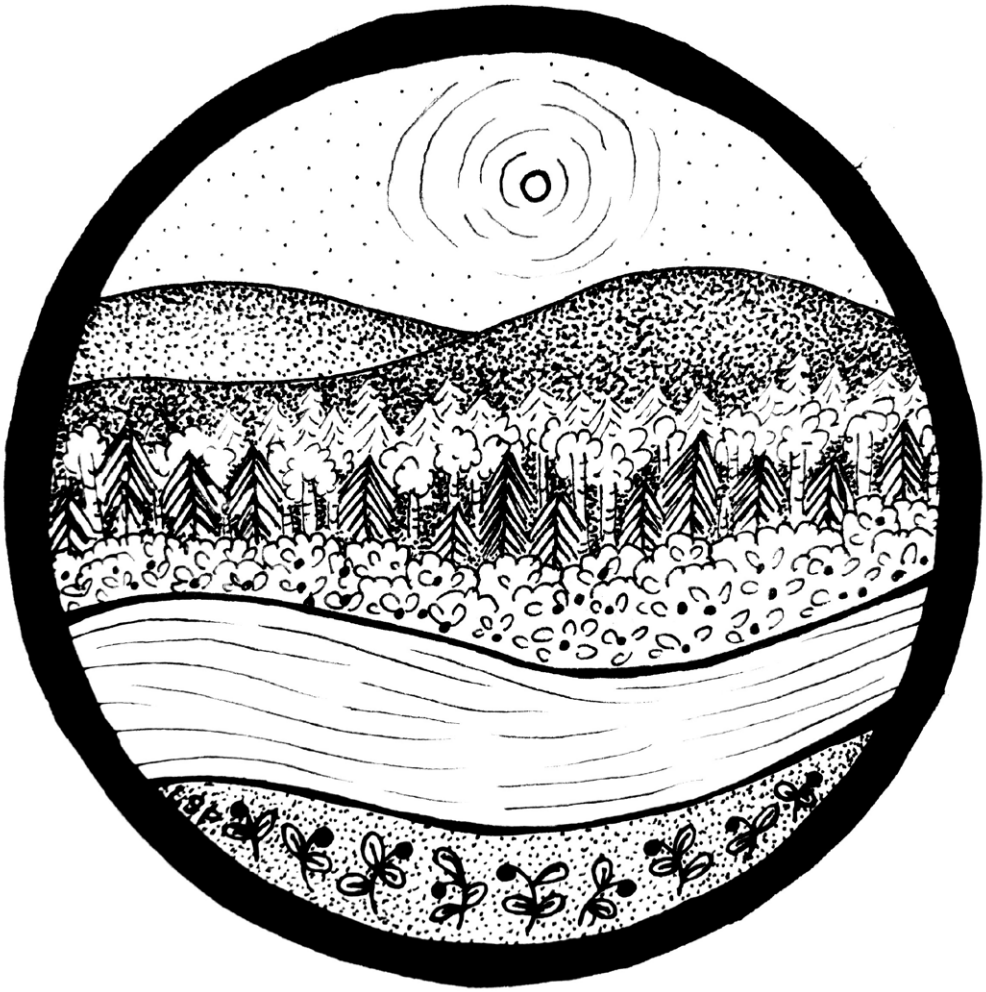
September

Unit 1: My Ecosystem



Guiding Questions

- What is an ecosystem? What are the animals, plants, and other living things that live around me?
- What do living things need to survive? How do different living things depend on each other?
- How does water shape my ecosystem? Where does my drinking water come from?
- How do seasonal changes affect my ecosystem?

Introduction

Ecosystem is really just another word for the world around you. It is an interconnected group of living and non living things that interact and depend on each other. This includes, animals, plants, fungi, bugs, water, rocks, trees, and you! ***Eco*** comes from the Greek word for "home" and ***system*** can mean a whole made up of many parts working together. Therefore, you can think of an ecosystem as a kind of home, a place made up of many things all living and working together.

In Interior Alaska, our ecosystem is known as the **boreal forest**. It is home to many people, as well as creatures as large as moose and as small as wood frogs. It is made up of birch forests, blueberry bogs, and so much more. In this unit you will explore and learn about the ecosystem you are a part of, focusing on patterns and cycles of plants, water, and weather. Check out the guiding questions on the front page to get you started.

Possible Standards Addressed

Next Generation Science Standards

As compiled by the Anchorage School District

- *Patterns:* Students learn how to safely use their five sense to make observations, exploring patterns in local weather and in plants throughout the seasons. Students make observations and collect data to show that weather is continuously changing, yet similar patterns repeat over time. Students recognize patterns in our everyday lives and learn how to record, compare, and analyze observed patterns and changes. **(Kindergarten)**

- *Observing Seasonal Variation:* Students observe seasonal variations of trees and weather and how they change over time in the yearly cycle. Students investigate the water cycle and cloud formation. Throughout the year, students record observations of variables such as temperature, length of day, and cloud cover, to develop an understanding of the typical weather conditions expected during each season. Students also examine how plant structures aid in plant growth and survival, and how these structures may be influenced by environmental factors. **(Grade 3)**

- *Interdependence:* Students learn about watersheds as a dynamic, interconnected physical and biological system. Students study how nonliving components of a watershed, such as water and soil, interact with living components, such as salmon. **(Grade 4)**

- *Ecosystem Dynamics:* students learn about ecology and the complex interdependent relationships among living and nonliving components of ecosystems. **(Grade 6)**

Alaska Standards for Culturally Responsive Schools

- Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them. Students who meet this cultural standard are able to recognize and build upon the inter-relationships that exist among the spiritual, natural and human realms in the world around them, as reflected in their own cultural traditions and beliefs as well as those of others, understand the ecology and geography of the bioregion they inhabit, and identify and appreciate who they are and their place in the world.

- Culturally-responsive educators use the local environment and community resources on a regular basis to link what they are teaching to the everyday lives of the students. They regularly engage students in appropriate projects and experiential learning activities in the surrounding environment, and provide integrated learning activities organized around themes of local significance and across subject areas.

Unit Resources & Suggestions for Further Learning

This is by no means a comprehensive list of resources, but instead is meant to be a few suggestions for resources that teach about Alaska's ecosystems and the topics covered in this unit. There are many other great nature-related resources out there as well (which you should definitely seek out!), but in the pursuit of localized education our goal is to point you towards some (mostly) Alaska-specific ones. We also acknowledge that books, movies, and written material are only one of many ways to gather knowledge, and that community Elders, knowledge-holders, local scientists, and others are often the best sources for local knowledge about our natural ecosystems.

Books

Fiction

- *Up On Denali: Alaska's Wild Mountain* by Shelly Gill; Illustrated by Shannon Cartwright
- *Swimmer* by Shelly Gill; Illustrated by Shannon Cartwright
- *River of Life* by Debbie S. Miller; Illustrated by Jon Van Zyle

For More Advanced Readers

- *The End of the Wild* by Nicole Heiget - A good introduction for mid-level readers to some of the complexities behind environmental issues and the forces that shape our ecosystems and communities.

Nonfiction & Field Guides

- *The Boreal Forest: A Year in the World's Largest Land Biome* by L.E. Carmichael; Illustrated by Josee Bisaillon
- *The Boreal Herbal* by Beverly Gray - A great guide to medicinal and food uses of common boreal plants and how to identify and prepare them.
- *Plants That We Eat: Bauriat Nignaqtuat*, from the traditional wisdom of the Inupiat Elders of Northwest Alaska, compiled by Anore Jones - A guide to traditional uses of many Arctic plants.

- *Alaska Trees and Shrubs*. Second Edition. Viereck, L. A., and E. L. Little. 2007. University of Alaska Press, Fairbanks, Alaska.
- *Field Guide to Alaskan Wildflowers* by Verna Pratt - A great field guide to identifying Alaskan wildflowers and flowering plants.
- *Guide to Alaskan Birds* by Robert H. Armstrong - A field guide for birds found in Alaska.

Movies & Videos

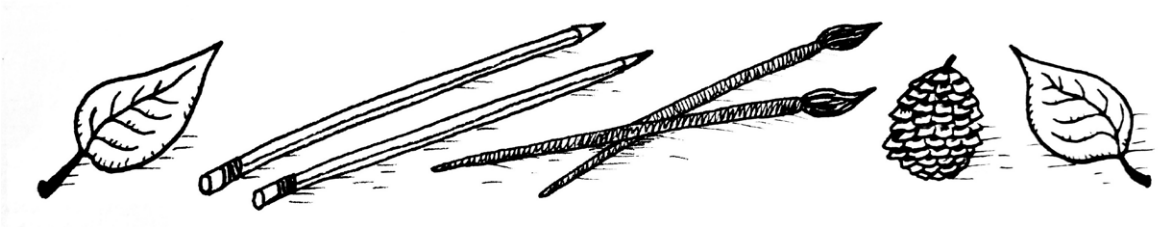
- Molly of Denali episode 11: "Sap Season," episode 12: "New Nivagi," episode 28: "Picking Berries" - Great episodes featuring facts and local knowledge about berries and harvest. https://pbskids.org/molly
- The BBC's *Planet Earth* Season 1, Episode 10: *Seasonal Forest* - Highlights the boreal forest (taiga) and some of its special features, and also compares it to other forest ecosystems. https://www.bbcamerica.com/shows/planet-earth/season-1/episode-10-seasonal-forest (Available to watch on Netflix and other platforms and available to borrow from most local public libraries.)
- *The Living Planet* Episode 3: *The Northern Forests* - An old BBC nature show pre-*Planet Earth*, with this episode about boreal forests availble to watch for free here: https://www.youtube.com/watch?v=ds2K5qm6bZM

Websites

- List of Educational Science Kits available to borrow from the Alaska Department of Fish & Game. *http://www.adfg.alaska.gov/index.cfm?adfg=educators.teachingkits*
- Alaska Department of Fish & Game's Wildlife Notebook Series; has lots of great facts and information about Alaskan animals. *http://www.adfg.alaska.gov/index.cfm?adfg=educators.notebookseries*
- Lessons and units created by the Alaska Native Knowledge Network, including lesson ideas about weather and plants. *http://ankn.uaf.edu/Curriculum/Units/*
- Virtual Lessons and Resources available from the BLM Campbell Creek Science Center in Anchorage, including nature learning resources and virtual programs. https://www.blm.gov/ccsc

Unit-Long Project Ideas

Projects are meant to serve as inspiration for further learning. Many can be done alone by more advanced or independent learners, and for younger learners some (like writing) can be done as a family or group project.

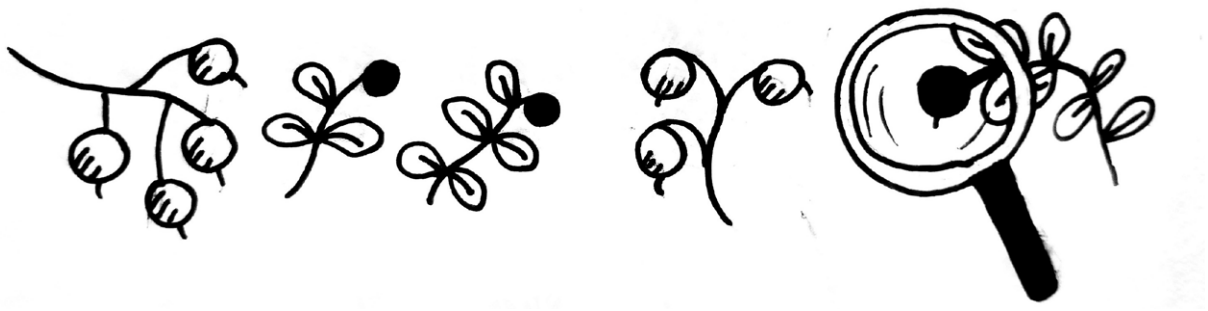


Art Projects

- Create a mural on a board or large piece of cloth or paper depicting your ecosystem. Include animals and plants and their habitats, water, landscapes, people, and whatever else you learn about!
- Keep a nature journal every day for a month, recording observations about the things you see outside and the local weather patterns.
- Learn a traditional skill or craft that uses materials from your ecosystem, like carving with wood or dyeing cloth with natural materials.

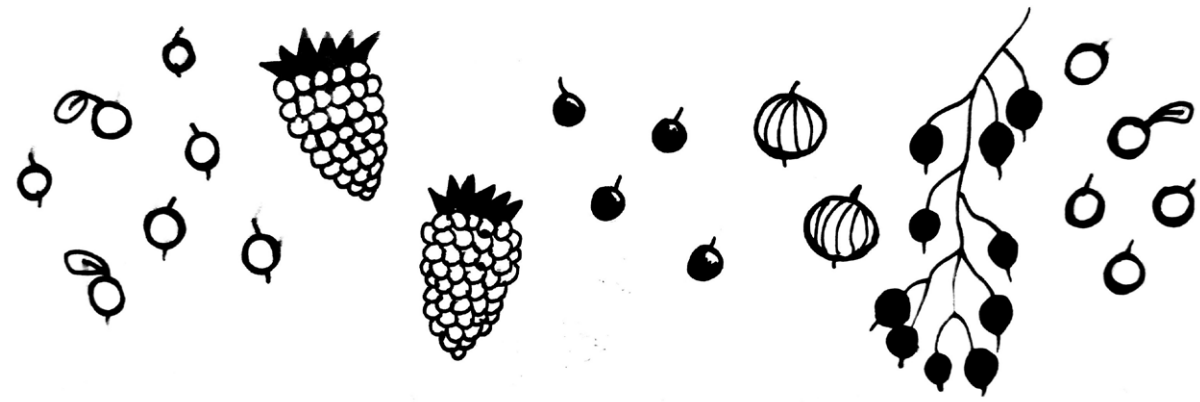
Reading & Writing Projects

- Learn about a current issue affecting your ecosystem (climate change, pollution, development, etc.) and write a letter to a local leader or organization who has the power to do something about it. Describe what you think should be done and why it is important.
- Choose a favorite animal or plant from your ecosystem and write a story from their perspective.



Science & Math Projects

- Do a daily "sit spot" where you choose a spot in nature (could be your back yard) and spend time being still and silent there every day, just seeing what you observe. It could be for 5 minutes or for 30; it's up to you. This activity could also be paired with a nature journal.
- Keep a daily weather log of conditions and temperature. Graph changes in temperature through a single day or throughout the month.
- Participate in a local community science (citizen science) project like the UAF Winterberry Project suggested in Week 1.



History, Culture, & Community Projects

- Ask a local Elder or someone who has lived in your area for a long time (or multiple people) to share with you what things were like when they were young. What was the weather and land like? How have things changed?
- Do something to help your local ecosystem like picking up trash around a park or trail.