WHAT IS AN ENVIRONMENT?

Overview

In this lesson, students will learn about local land and water environments and understand the need for classifying in order to organize data to understand that the local environment provides for the local community.

Objectives

On successful completion of this lesson, students will be able to:

- create a two circle Venn diagram depicting the resources of the water and land environments; and
- illustrate and label the local environment and community, including land and water resources; and
- identify three resources the local community might need from both the land and water environments.

Alaska Standards

Alaska Science Standards / Grade Level Expectations

[3] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.

[3] SA1.2 The student demonstrates an understanding of the processes of science by observing and describing the student's own world to answer simple questions.

[3] SC2.1 The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by sorting animals and plants into groups based on appearance and behaviors.

[3] SC3.1 The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by identifying examples of living and non-living things in the local environment.

Alaska Math Standards

2.MD.9 Collect, record, interpret, represent, and describe data in a table, graph or line plot.

Alaska English / Language Arts Standards

W.3.2.a-d Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Alaska Cultural Standards

[D] Culturally knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning. Students who meet this cultural standard are able to:

[D.1] acquire in-depth knowledge through active participation and meaningful interaction with Elders.

[D.3] interact with Elders in a loving and respectful way that demonstrates an appreciation of their role as culture bearers and educators in the community.

[E] 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:

[E.2] understand the ecology and geography of the bioregion they inhabit.

Bering Strait School District Scope & Sequence

2nd grade sequence #4: Living Things (Animals)

A. Understands the difference between living and non-living things

C. Understands how we classify animals

E. Uses scientific processes and inquiry to directly support the concepts of living things

3rd grade sequence #4: Living Things (Animals)

A. Identify and sort examples of living and non-living things in the local environment

E. Sort animals into groups based on appearance and behaviors

H. Use scientific processes and inquiry to directly support concepts on animals

Materials

- Hand lenses (one per student)
- Chart paper (one sheet per group of three)
- Markers (one per group of three)
- Scissors
- String
- Worksheet: Land and Water Venn Diagram
- Homework worksheet: Land and Water Environments
- *One Small Square: Woods* by Donald Silver
- *What is a Living Thing?* by Bobbie Kalman

Additional Resources

Arctic Tundra by Donald Silver

Seashore by Donald Silver

Oceans: Underwater Worlds by Laura Purdie Salas

What If There Were No Sea Otters?: A Book About the Ocean Ecosystem by Suzanne Slade and Carol Schwartz

Life in an Ocean by Carol K. Lindeen

Polar Sea Life by Jinny Johnson

Plants Are Living Things (Introducing Living Things) by Bobbie Kalman

Classifying Insects (Classifying Living Things) by Andrew Solway

Classifying Invertebrates (Classifying Living Things) by Francine Galko

Animals Without Backbones (Big Science Ideas) by Bobbie Kalman

Activity Preparations

1. Read through the entire lesson, including the background information in the Whole Picture section.
2. Divide the room into 10 to 12 small areas to be observed by small groups of students.
3. Create a chart with two columns and three rows. Label the columns land environment and water environment. Label the rows non-living, living, and once living. Make the chart long enough to allow most of the non-living, living, and once living resources of the environment to be listed.

Example of chart:

	Land Environment	Water Environment
Non-living		
Living		
Once living		

4. Ask a local culture knowledge bearer to visit the class and explain the importance of the local land and water environments to the community.

Whole Picture

An environment is all the living and nonliving things that make up a particular area: the plants, the animals, the stones, the earth, the people, the clouds, and so forth. Science teaches that living things like plants and animals, are biotic elements, whereas non-living things, like air, rocks, and water are abiotic elements. Biotic elements need abiotic elements to survive. Native wisdom teaches that the survival of a healthy environment requires careful attention and respect from the people who help to populate it; after all, the environment is "the provider of life, food, health, and future" (Charles, 2002, p.31).

The environments of northwestern Alaska are varied and diverse. Three distinct environments here support a plethora of plants and animals: the tundra, the boreal forest, and the ocean. The tundra environment is characterized by plants of short stature: one might find lichen and sedges, low-lying bog plants, and flowers; also fish, insects, caribou, muskoxen, fox, hare, and snowy owls. The boreal forest environment is home to spruce and birch, willow shrubs, wild roses, berries, and grasses; as well as voles, moose, bear, hare, raven, insects, ptarmigan, and ground squirrels. And the ocean environment abounds with whales, many species of fish, crab, sea birds, seals, and smaller living creatures like phytoplankton. Each of these environments also includes abiotic elements: rocks, water, air, and clouds. Further, Alaska Native elders teach that all living and non-living things in these environments are bound by a spiritual tie.

WHAT IS AN ENVIRONMENT?

Traditionally, Alaska Native people helped to maintain an intricate balance within their niche by living in harmony with their surroundings (Barnhardt, 1996, p. 1-2); winter and summer camps were made in tune with the local area — disturbing the environment as little as possible (Kawagley, 2006). In addition, people participated in intricate ceremonies to appease the spirits of the animals, plants, and weather. To this day, many communities continue to celebrate important rituals and ceremonies to help maintain the environment. For example, Nalukataq, the Iñupiat Spring Whaling Festival is held each year to appease the spirits of the taken whales and ensure successful future harvests. Likewise, the Yup'ik Bladder Festival honors the spirits of the seals and ensures their return in future hunts.

Alaska Native peoples have been observing the environment for generations, and as such, have an intimate understanding of environmental signs, including "clouds, sun, moon, northern lights … the stars twinkling, and strong winds moving through" (Kawagley, 2006, p. 54). Changes in these environmental elements can signify dramatic changes in other parts of the environment. For example, the blooming of cotton grass often heralds the arrival of salmon. As a result, being able to recognize these changes is an important skill.

In recent years, many changes have appeared on the landscape, making it difficult to accurately predict when subsistence activities should begin and end. For example, in Savoonga, the village chief has noted that a great deal of coastline has been lost, as well as many lakes and ponds, "where migratory birds lay their eggs in the summertime" (Kingeekuk, K., 2010). Likewise, people have noted great changes in the amount and type of sea ice. Changes in the extent, timing, and thickness of ice impact whales, seals, walrus, and polar bear populations, and consequently impact subsistence harvests. For instance, in 2011, many people went without walrus meat (an important dietary element) for the winter (Kingeekuk, M., 2011).

Many environmental changes are accelerating due to climate change. Alaska Native elders and culture bearers also caution that the changes are the result of disrespectful human thoughts and actions. Elders warn that because the younger generations are not observing long-held practices and taboos, the spirits are restless and displeased (Fienup-Riordan and Rearden, 2012; Krupnik and Jolly, 2002).

Elders and culture bearers maintain that young people should learn to read signs from their environment; careful observation continues to be an important skill. As students learn to recognize elements of their environment, they may wish to learn from their elders and culture bearers about the changes that are happening, what they can do to adapt to these changes, and how they can create a relationship with their environment that aligns with their values.

Vocabulary

classify – sort into groups in order to study information

resource – a material that is found in an environment and used by a living thing

environment – a place where all the living, non-living, and once living things are used by living things in that area

once living – something that was once alive but no longer is and does not need food, water, or air

living thing – a plant or animal that is alive and needs food, water, and air

non-living things – things that are not alive: air, rocks, water, and sunlight

Activity Procedure

Part 1

1. Introduce the lesson by sharing the book *One Small Square: Woods* by Donald Silver. Discuss the pictures and read aloud portions of the text.
2. Explain to the class that sometimes because small things go unnoticed, we do not know they are there. Tell the class they are going to practice their observation skills by examining a small section of the classroom closely and taking notes of what they find. Tell them they are going to change their perspective or view of how they see things. They are going to get down on floor level and observe the floor environment as if they were a bug or a small rodent. Give the following instructions:
    - The class will be divided into groups of three students.
    - Each group will have hand lenses for making observations and chart paper to record their observations.
    - Each group must:
        - Stay on the ground and in their specified observation area,
        - Not disturb the personal possessions of teachers or students in the class room, and
        - Avoid closets, cupboards, or specified areas that are off limits.
    - Each group will have ten minutes to observe and record their findings.
    - Groups may draw or write notes to record what they find.
3. After the observation period, ask the students (pre-assessment):
    - What did you observe about your area?
    - Did you observe anything unexpected?

- How was your perspective or view as something small different from that as a human?
- What kind of things did you see that you missed from a higher viewpoint?
- How could you sort the things that you observed?

4. Explain that the little area they just observed could be considered a micro (mini) environment. Review the terms environment and resource. Ask students what the resources of an environment are? Identify the resources of an environment as living, non-living, and once living things. Review the vocabulary terms of living and non-living and introduce the term of once living. Ask the students to share any observations from their micro environment that fit those terms.
5. Explain that Earth is a big place and is made up of different environments and that one thing scientists do to understand environments is to classify the things found in those environments. Explain that when scientists classify things, they put things that are similar into groups. It is easier to study a few groups that are similar than a lot of individual things (do some simple examples of classification with the class, such as, male and female, shoe color, height, etc.). Explain that classifying is a useful tool for organizing and studying information. Explain that when students list environmental resources as living, non-living, or once living, they are classifying those resources. Tell the students they are going to focus on learning about the land and water environments in the local community, and how to classify the resources of each environment.
6. Ask the students to think about the local environments in their community. Tell them the tundra and boreal forest will represent the local land environment and the Norton Sound and Bering Sea will represent the water environment. Pointing to the chart on land and water environments, ask: What are some non-living resources of a land environment? (e.g., soil, air, clouds, temperature). Record student responses on the chart. Continue with the living and once living resources for land, recording the student responses. Explain that even though we may not be able to observe them as well, the resources in the ocean are similar to those in the tundra. Ask the students for examples from the water environment that they know or can think of and list them in the appropriate area for non-living, living, and once living on the chart.
7. Ask (student assessment of learning):
    - How are the non-living resources in the land and water environments similar? How are they different?
    - How are the living resources in the land and water environments similar? How are they different?
    - How are the body parts of living things in each environment the same or different?

- How would animals meet their need for food in each environment?
- How would animals meet their need for shelter in each environment?
- How would animals meet their need for air in each environment?
- How are the once living resources in the land and water environments similar? How are they different?
- Which resources were part of both environments?
- How does weather affect each environment?
- How do the seasons affect each environment?

Part 2

1. Read aloud the book *What is a Living Thing?* by Bobbie Kalman.
2. Review the chart you created for Land Environment and Water Environment in Part 1, classifying living, non-living, and once living rseources. As a class, circle around and demonstrate how to create a two circle Venn diagram with string, labeling one circle land and the other circle water. Transfer the non-living resources from the chart onto the Venn diagram. Options include: cutting the chart up and placing the words in the Venn diagram or writing on separate paper and placing the words in the Venn diagram.
3. Ask (student assessment of learning):
   - How did the Venn diagram help you classify the non-living information from the chart?
   - Looking at your Venn diagram, what non-living resources were the same? How do you know?
   - How could the non-living resources affect the environments?
   - How do the non-living resources of the land or land environment affect the people in the local community?
   - How do the living resources of the land or water environment affect the people in the local community?
4. Have students complete the Student Worksheet: Land and Water Venn Diagram, recording the living and once living resources from the chart onto the Venn diagram.

Part 3

1. Invite a local culture knowledge bearer to visit the class to talk about the importance of the local land and water environments to the local community. Have them talk about how change in the environment from weather and the seasons affect the local community.

2. Have the students complete the STUDENT WORKSHEET: Land and Water Environments at home. Tell them to return the worksheets the next day to share with the class.

Extension Activities

- Write a short paragraph describing what would happen to a land or water environment if one of the non-living resources changed or was missing.
- Create models or murals of land and water environments.
- Make a book of local plants and animals living in the local environment.

Answers

Part 1

6. Chart on living, non-living, and once living things in land and water environments. Answers will vary, examples given.

	Land Environment	Water Environment
Non-living	Rocks, soil (living and non-living), air, water, temperature, clouds, answers will vary	Water, buoyancy, water currents, temperature, salinity, answers will vary
Living	Trees, bushes, grass, geese, fox, currants, fireweed, soil (living and non-living), moose, bears, willow, lichen, molds, insects, birds, wolves, answers will vary	Fish, whales, seals, walrus, puffins
Once living	Dead grass, rotten logs, decayed leaves, dead animals, walrus tusks, bones, teeth, claws, answers will vary	Seal skin, fish bones, answers will vary

7. Questions (student assessment of learning):
   - Non-living resources in the land and water: answers will vary.
   - Living resources in the land and water: answers will vary.
   - Physical resources of living things: fins, fur, scales, shape, answers may vary.
   - Animal needs of food, air, and shelter: fish have scales to get oxygen out of the water, whales have blow holes, fur animals are warm blooded, answers will vary.
   - Once living resources: remains of plants or animals that have died; different

stages of decay; answers will vary.

- Living organisms get their air to breath when they live in water: from surface air, from the water.
- Resources part of both environments: water, soil or sand, animals and plants present, oxygen, insects; answers will vary.
- Weather and climate effects: living things have to adapt, changes the physical resources of the environment; answers will vary.

Part 2

2. Venn diagram on non-living things: Answers will vary depending upon the responses recorded on the chart.
3. Venn Diagram assessment questions:
    - Venn diagram classification: helped organize the date, displayed the resources that were the same in both environments, displayed the resources that were found only in each environment.
    - Venn diagram: the resources that were the same in each environment shared the inner space where the circles overlapped.
    - Non-living resources affect the environments: cause a change in seasons, freeze the water, influence the temperature, answers will vary.
    - Non-living resources affect the people: change the climatic conditions, affect the animals the people depend upon, cause travel difficulties, answers will vary.
    - Living resources affect the people: if they do not reproduce or move away, there might not be enough food, eat smaller game, answers will vary.
4. Worksheet: Land and Water Venn Diagram – answers will vary dependent upon how the classroom chart was completed.

Part 3

- Homework Worksheet: Land and Water Environments – Illustrations, labeling, and details will vary depending upon individual student choice and focus.

Resources

Barnhardt, Ray. (1996). "Integrating Native Ways of Knowing into the Curriculum, Sharing our Pathways." 1 (2), p. 1–2. Accessed from: http://ankn.uaf.edu/sop/

Charles, Walkie. (2002). "See Connections — All Things are Related." In *Alaska Native Ways: What the Elders Have Taught Us*, Ed. Corral, Roy. Portland: Graphic Arts Center Publishing.

Fienup-Riordan, Ann, and Alice Rearden. (2012) "*Ellavut: Our Yup'ik World and Weather. Continuity and Change on the Bering Sea Coast*." Seattle and London: University of Washington Press.

Kawagley, Angayuqaq Oscar. (2006). "*A Yupiaq Worldview: A Pathway to Ecology and Spirit*." Long Grove: Waveland Press.

Kingeekuk, Myron. (2011). "Climate Change Impacts on Walrus." from *Stories About Adaptation and Subsistence: Native Voices from the Frontlines of Climate Change*. Aksik. Accessed from: http://aksik.org/content/2011-climate-change-impacts-walrus

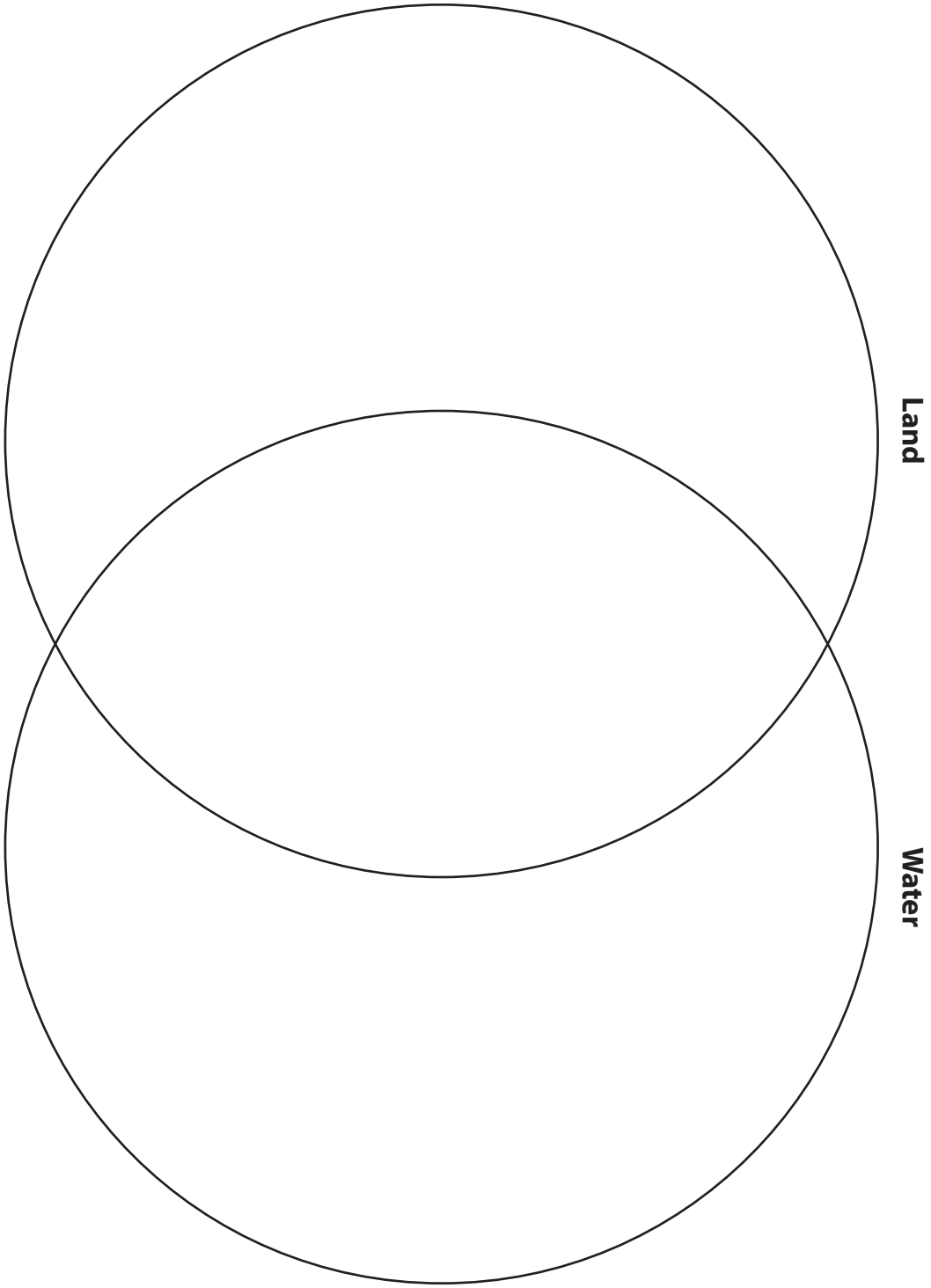
Kingeekuk, Kenneth. (2010). "Overview of Impacts from Savoonga." from *Stories About Adaptation and Subsistence: Native Voices from the Frontlines of Climate Change*. Aksik. Accessed from: http://aksik.org/content/2010-overview-impacts

Krupnik, Igor, and Daynna Jolly. (2002). "The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change." Arctic Research Consortium of the United States and Smithsonian Institution Presses

Student Worksheet: Land and Water Venn Diagram

Name _____

From the chart completed in class, record the living and once living resources for the land and water environments onto the Venn diagram.



Student Worksheet: Land and Water Environments

Name_____

Draw a picture illustrating the land and water environments and community you live in. In the illustration, label three resources the community needs from the local land environment and three resources from the local water environment. In the illustration, include examples of non-living, living, and once living things from each environment.