

WHAT ARE THE SEASONS?

UNIT 3: Seasons INSTRUCTIONS



Overview

Students interact with an elder or culture bearer on the topic of changing seasons, then play a matching game to identify what plants and animals are around during which seasons.

Teacher's Note

Because you are inviting a guest to your classroom, this lesson may be split into two days.

Theme Learning Goal

On successful completion of all units in Theme 1 (Changing Weather and Climate), students will be able to answer the following question with detail and specific examples appropriate to their age group: How are weather and climate changing in our area?

Objectives

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

- A. Understand seasons in their area
- B. Use scientific processes and inquiry related to seasons

Targeted Alaska Science Standards

- [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] SA2.1 The student demonstrates an understanding of the attitudes and approaches to scientific inquiry by answering "how do you know?" questions with reasonable answers.
- [3] SA3.1 The student demonstrates an understanding that interactions with the environment provide an opportunity for understanding scientific concepts by observing local conditions that determine which plants and/or animals survive.



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[3] SC1.1 The student demonstrates an understanding of how science explains changes in life forms over time, including genetics, heredity, the process of natural selection, and biological evolution by sorting Alaskan plants and/or animals using physical characteristics (e.g., leaves, beaks, seasonal onset).

Targeted Alaska Cultural Standards

- [B] Culturally-knowledgeable students are able to build on the knowledge and skills of the local cultural community as a foundation from which to achieve personal and academic success throughout life.
- [B.2] Students who meet this cultural standard are able to make effective use of the knowledge, skills, and ways of knowing from their own cultural traditions to learn about the larger world in which they live.
- [D] Culturally-knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.
- [D.1] Students who meet this cultural standard are able to acquire in-depth cultural knowledge through active participation and meaningful interaction with elders.
- [E] Culturally-knowledgeable students demonstrate an awareness of the relationships and processes of interaction of all elements in the world around them.
- [E.2] Students who meet this cultural standard are able to understand the ecology and geography of the bioregion they inhabit.
- [E.3] Students who meet this cultural standard are able to demonstrate an understanding of the relationship between world view and the way knowledge is formed and used.

Alignment to BSSD Scope & Sequence

- 1st grade sequence #10: Seasons



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Vocabulary

season	a time of the year that has a certain kind of weather. Four seasons are spring, summer, fall, and winter
winter	the coldest season of the year; also the season with the shortest days
spring	the season after winter and before summer when vegetation and animals begin to return
summer	the warmest season of the year; also the season with the longest days
fall/autumn	the season after summer and before winter when many plants and berries are harvested

Language Links

Native Language Terms			
English	Yup'ik	Siberian Yupik	Iñupiaq
Summer	kiak	kiik	upingaaq
Winter	uksuq	uksuq	ukiuq
Fall/Autumn	uksuaq	uksaaq	ukiaq
Spring	kiapauq, up'nerkaq	upenghaq	upingaksraq

Whole Picture

Most places on Earth experience seasonal changes. Some people think that it is hotter in the summer because the earth is closer to our sun, the star at the center of our solar system. This is not the case. Earth is actually closer to the sun in the winter, but because the earth is tilted on its axis, the imaginary line around which the globe rotates, the sun's rays hit Earth at more of an angle, so temperatures are less intense.

Seasons, distinguishable by the amount of daylight and the temperature, are caused by three factors: the degree Earth's axis is tilted, Earth's rotation on its own axis, and its revolution, or orbit, around the sun.



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Night and Day

Earth's axis is tilted at approximately 23.5° , an angle that remains constant as Earth rotates on its axis and completes its orbit around the sun. Every 24 hours, Earth rotates counterclockwise on its axis, creating day and night. When a point on Earth faces the sun, it is day; when it faces away from the sun, it is night. For most of the planet, the sun appears to rise in the east and set in the west. Closer to the poles, however, the sun only appears to rise in the east and set in the west during spring and fall. In the Arctic and sub-Arctic, for example, the sun appears to rise in the north and set in the north during summer, while it appears to rise and set in the south during winter. This is because of Earth's tilt. If not for the tilt, the sun would appear to rise and set in the same places year round.

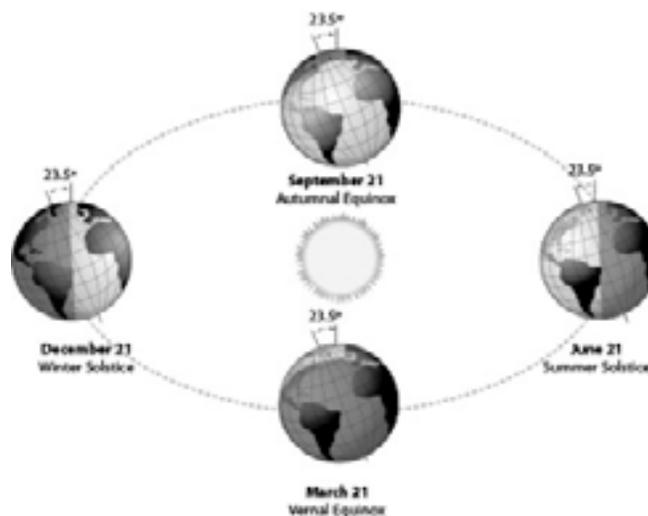
Seasons

Like the other planets in our solar system, Earth orbits the sun. One orbit takes approximately 365 days, or 1 year. During this orbit, the seasons slowly change.

Summer solstice, occurring approximately June 21st every year, marks the beginning of summer for the Northern Hemisphere. At this date, the North Pole, marking the northern tip of Earth's axis, is tipped toward the sun.

As a result, the Northern Hemisphere receives a greater amount of solar energy, and therefore experiences warmer temperatures and increased daylight. At the same time, on the opposite side of the earth, the South Pole points away from the sun. This results in the Southern Hemisphere experiencing reduced daylight and a reduction in solar energy, which leads to cooler temperatures. Thus, when it is summer in the Northern Hemisphere, it is winter in the Southern Hemisphere.

The autumnal equinox, approximately September 22nd each year, marks the point at which neither the North nor South Poles point toward or away from the sun. This is the beginning of fall, or autumn, in the Northern Hemisphere (and the beginning of spring in the Southern Hemisphere). The entire planet experiences 12 hours of daylight and 12 hours of darkness.



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As Earth continues its revolution around the sun, the North Pole will point away from the sun, and the South Pole will point toward the sun. On December 21st each year, the winter solstice arrives for the Northern Hemisphere — the darkest day of the year. After this date, the days will get longer again, as Earth moves toward spring. The sun's rays also hit the Northern Hemisphere at an angle, creating lower thermal energy, and thereby cooler temperatures. Meanwhile, in the Southern Hemisphere, the opposite is happening; winter in the Northern Hemisphere means summer in the Southern Hemisphere.

The vernal equinox, the beginning of spring, occurs in the Northern Hemisphere around March 21st. Like fall, neither the North nor South Poles point toward or away from the sun. All parts of Earth experience 12 hours of daylight and 12 hours of darkness. In the Northern Hemisphere, the days will continue to get longer as the summer solstice approaches and the cycle begins anew.

Regional Differences

Seasons vary from region to region on the globe, especially at the poles. Above the Arctic Circle, for example, the sun does not set at all between mid-April and mid-August. Long days provide ample time to gather resources that will be used during winter. Many people travel to fish camps and stay up late to process their harvests. During the winter season, there are more hours of darkness than of daylight, and temperatures are colder. Above the Arctic Circle, the sun sets in mid-November and does not show itself again until mid-February. Winter has traditionally been a time to come together as a community, to share stories, and participate in traditional inside activities, using materials gathered during the longer summer months.

Even though the South Pole experiences a summer of constant daylight, the days never get very warm, because the sun's rays hit at an angle, which results in a lower thermal energy. At the equator, the imaginary line encircling the globe half way between the North and South Poles, the temperature and number of daylight hours stay relatively constant throughout the year. This is because the angle at which the sun's rays hit that location of the globe change very little throughout the year.





Materials

- Laminated “Seasonal Plants and Animals” Game cards
- “Seasons” location signs
- Masking tape
- Construction paper
- Colored pencils / crayons
- Extension Activity: Hello Arctic, by Theodore Taylor, illustrated by Margaret Chodos-Irvine

Additional Resources (including BSSD text alignment)

- HSP I: Ch. 8, Lessons 1–4

Activity Preparation

1. Invite an elder or culture bearer to visit your classroom, to help students learn about seasons in your area. They may also wish to help students learn Native language terms.

Teacher’s Note

Remember to explain what students are learning about in your classroom, and ask in a manner that is culturally appropriate. For example: “My students are learning about seasons, and they would like to learn about traditional activities that take place each season. If you would like to help them learn about this, we would be very pleased to invite you to our classroom.”

2. Prepare refreshments for your guest.
3. Review the Native language terms, and ask a language speaker at your school to help you with pronunciation, or to suggest a more appropriate term.
4. Read the “Whole Picture” section.
5. Prepare for the “Seasonal Plants and Animals” Game
 - a. Randomly shuffle the game cards
 - b. Using the masking tape, mark out a space on your classroom floor for each season.

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- c. Place one season sign in each of the four designated areas. Note: you may want to attach the signs to a stick, the wall or a chair so they are more easily visible.
6. Review with students expected behavior when your guest arrives: they should listen attentively and be prepared to follow any directions the elder gives.
7. If you plan to read Hello Arctic as an extension activity, read the story.

Activity Procedure

1. When your guest arrives, have students invite him / her to a comfortable location and offer some refreshment.
2. Explain to your guest that students are learning about seasons, and they would like to learn about traditional activities that happen each season. Allow your guest time to visit with students and share what they know about plants, animals, and weather of each season.

Teacher's Note

You may choose to do the following activities the day after your guest has visited. If so, start by reminding students what they learned during the elder's visit. Ask questions like, "What kinds of activities can we do in winter? What is the weather like in summer? Can we find salmon at the beginning of spring? Etc." If you choose to do the activity the same day as your guest visits, you may wish to ask them to participate.

3. Explain to the class that you will all play a matching game. Tell students the goal is to match each object with its season.
4. Show students the areas in the room that you have designated for each season. Tell students that as a class, you will decide the season in which to place each object.
5. One by one, show each card to the class. With each card do the following:



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- a. Instruct students to name the object.
Example: Show students the card with blueberries and ask, "What does this picture show?" If students do not know, tell them.
 - b. Ask if the object can be found in the various seasons.
Example: Can you pick blueberries in winter? (No.) Can you pick blueberries in spring? (No.) Can you pick blueberries in fall? (Early fall — yes; late fall — no.) Can you pick blueberries summer? (Yes.)
 - c. Ask a student volunteer to place the card in the location of its matching season. Example: a student volunteer places the blueberry card in the area designated for summer.
 - d. Alternately, give each student a card and instruct him/her to make the determination individually. Students can then take their card, stand in the appropriate seasonal location, and explain why they chose to stand there. If the class disagrees with the student's decision, work together as a class to determine which season is more appropriate.
6. Use the construction paper and colored pencils / crayons to have students write a thank-you card to your guest.
 - a. You may wish to do this as a class or individually.
 - b. Students may wish to draw a picture of their favorite seasonal activity.
 7. Extension Activity: Read the book Hello Arctic to the class. Discuss the different seasonal animals and weather types.





Teacher Information Sheet: Answers (Animals) “Seasonal Plants and Animal’s Game

Fall	Winter	Spring	Summer
Fish: Salmon (Silver & Chum) Trout Whitefish Mammal: Moose Caribou Rabbit Beluga Seals	Fish: Trout Whitefish Mammal: Caribou Rabbit	Fish: Trout Mammal: Caribou Rabbit Seal Walrus Beluga	Fish: Salmon (King, Humpy, Silver, Dog, and occasionally Red) Trout Mammal: Seal Walrus
Birds: Geese Ducks Cranes Swans Ptarmagain	Birds: Ptarmagain	Birds: Geese Ducks Cranes Swans Ptarmagain	Birds: Geese Ducks Cranes Swans

Note: This chart is based on what happens in Unalakleet, and is not a comprehensive list. Although there are four main seasons, people also consider the shoulder seasons (early spring, early summer, early fall, late spring, late fall, etc.). It is hard to try to fit everything into each season because some activities occur between two seasons.



**Teacher Information Sheet:
Answers (Plants) “Seasonal Plants and Animals” Game**

Fall	Winter	Spring	Summer
<p>Berries: Blueberries Cranberries Currants Rosehips</p> <p>Plants: Fireweed Labrador Tea Masu (Eskimo potato)</p>	<p>Berries:</p> <p>Trees: Alder</p>	<p>Berries:</p> <p>Plants: Beach greens Seaweed with herring eggs Fireweed Labrador Tea Masu (Eskimo potato)</p> <p>Trees: Willow leaves (Sura) Cottonwood Alder Beachwood</p>	<p>Berries: Salmonberries Blueberries</p> <p>Plants: Sour dock Rhubarb</p> <p>Trees: Cottonwood Alder Beachwood</p>

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Seasonal Plants and Animals - Season Station Signs

Spring

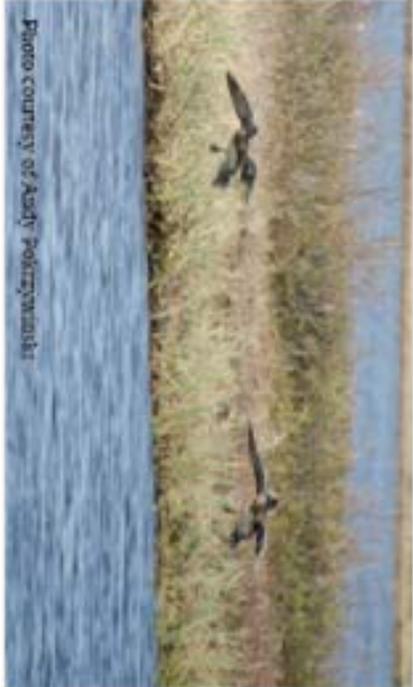


Photo courtesy of Andy Potrzywinski

Fall



Photos courtesy of Andy Potrzywinski



Seasonal Plants and Animals - Season Station Signs

Winter

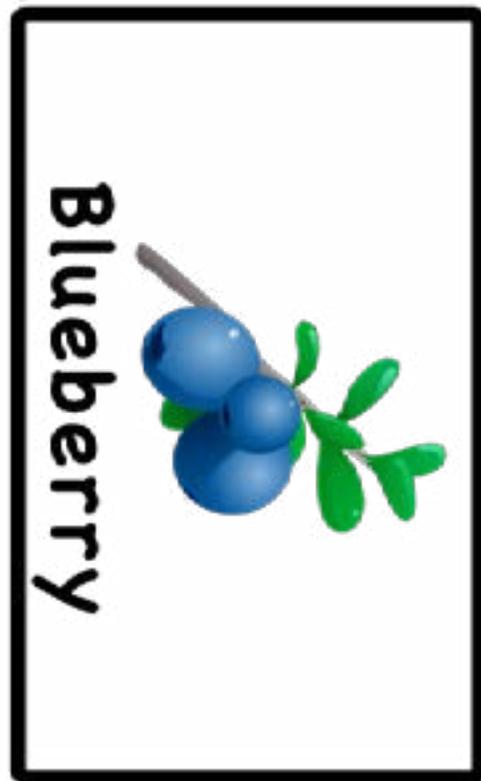


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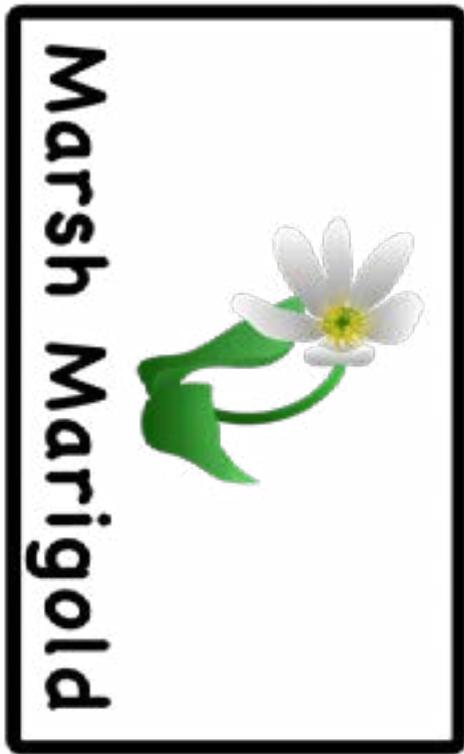
Summer



Photo courtesy of Andy Pokrzywnicki



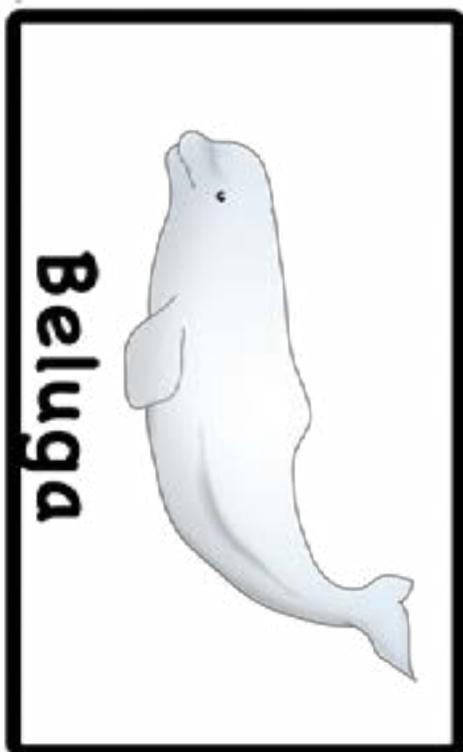
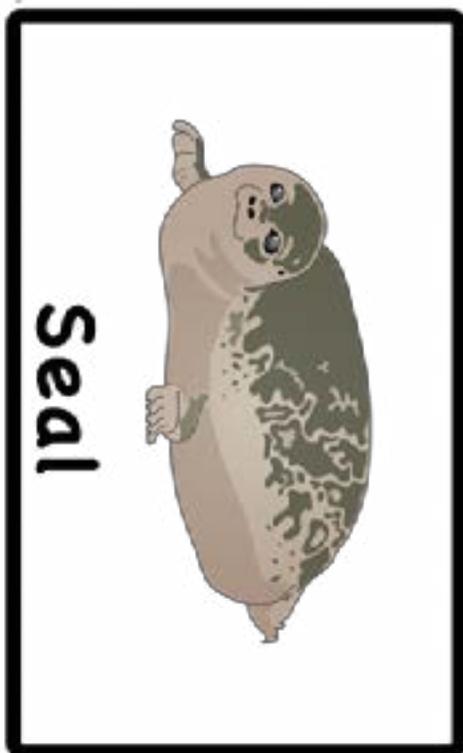






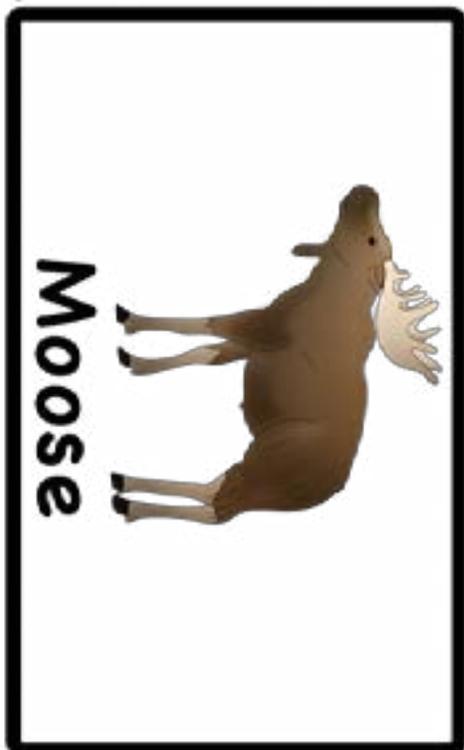
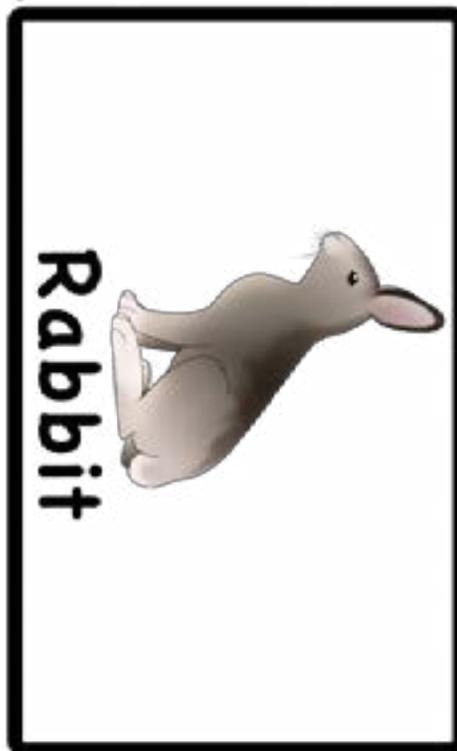
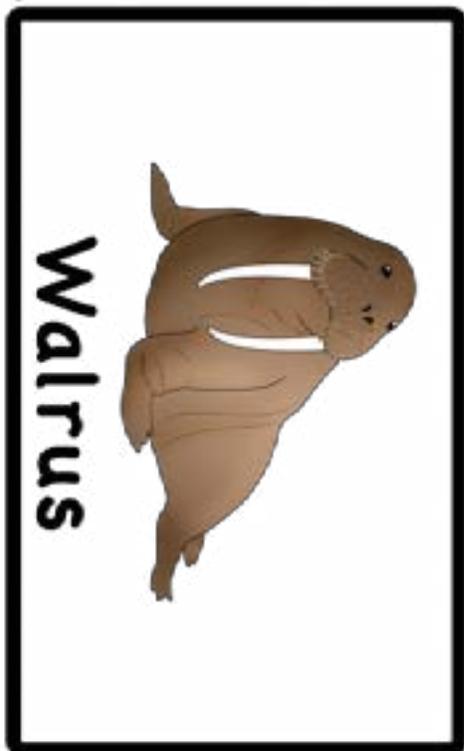
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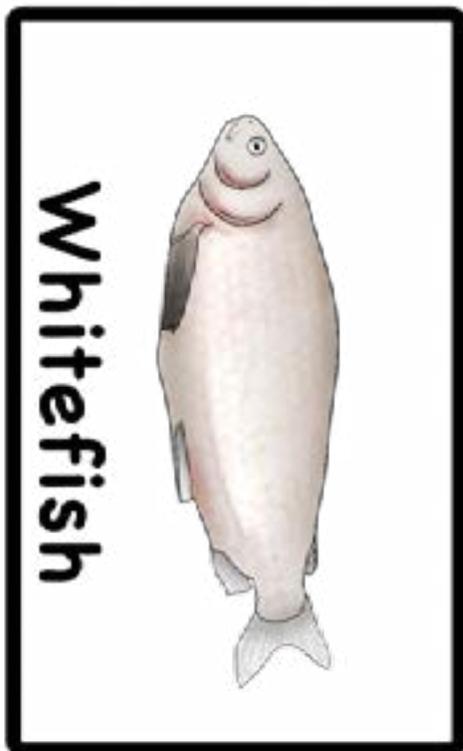
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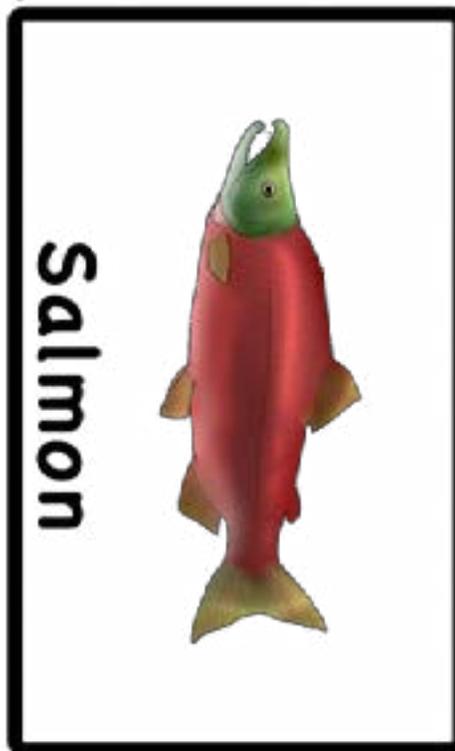
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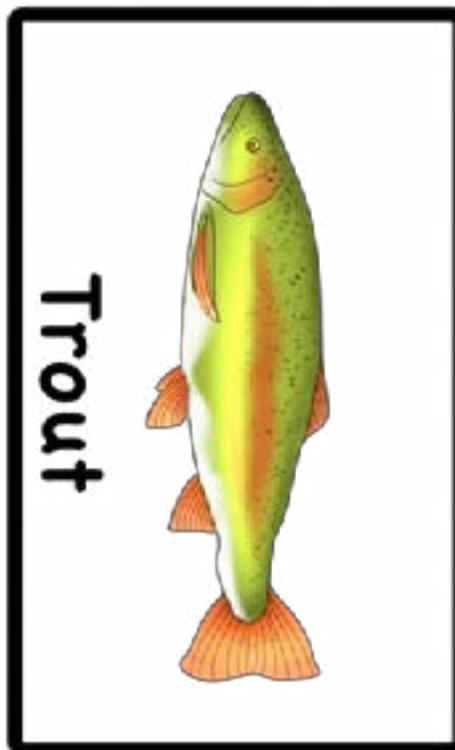




Whitefish



Salmon



Trout