Web of Life: River Edition

ALASKA STATE SCIENCE AND CULTURAL STANDARDS

Science Standards

A. Science as Inquiry and Process

SA Students develop an understanding of the processes and applications of scientific inquiry.

- **SA3** Students develop an understanding that culture, local knowledge, history, and interacting with the environment contribute to the development of scientific knowledge, and that local applications provide opportunity for understanding scientific concepts and global issues.

C. Concepts of Life Science

SC Students develop an understanding of the concepts, models, theories, faces, evidence, systems, and processes of life science.

- **SC3** Students develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.

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.

- **B3** Make appropriate choices regarding the long-term consequences of their actions

E Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.

- **E2** Understand the ecology and geography of the bioregion they inhabit

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Science Standards taken from Alaska Performance Standards, Department of Education and Early Development of the State of Alaska.

Cultural Standards taken from Alaska Standards for Culturally Responsive Schools, adopted by the Assembly of Alaska Native Educators; Anchorage, Alaska; February 3, 1998.

Web of Life: River Edition

Grade Levels Lower Elementary (K – 2nd) & Upper Elementary (3rd - 5th)

Materials 1 ball of yarn/string, River Member cards (optional), crayons/markers (optional)

Time 30 - 45 minutes

Objectives Students will be able to:

- Name two relationships between living things in a river community
- Explain the interconnectedness of all members of an ecosystem
- Identify two things people can do to help keep the river clean

DIRECTIONS

1. In preparation for the activity, each student is going to need a River Member card indicating what role they play in the river community story. You can use the images provided below or you can assign them with a role and they can draw as well as label a picture as their River Member card. Feel free to let the students color their card prior to starting.

Members of the River Community:			
-River	-Salmon	-Berries	-Fireweed
-Aquatic Plant	-Bear	-Birds	-People
-Insects	-Soil	-Fox	

Most roles can be doubled up if the class size exceeds 11. When more than one student plays a given role, the two students should be next to each other in the circle.

Note: Feel free to add members to the story or change them so they are specific to your location in order for students to make connections to their local environment.

2. Each student takes on the role as one of the members of the river community that are listed above. The corresponding River Member card pictures will serve as a nametag for the members in the story and should be worn by students, either around their necks with yarn or taped to their shirts.

3. Have students sit or stand in a circle and make sure they are not in the order of the list above. The teacher will narrate the story. A ball of yarn will be passed to each student when his/her role is mention in underlined capital letters in the script. The crisscrossing yarn inside the circle will gradually form a web, displaying the interconnectedness of members that are part of a river ecosystem.

4. The "river" will be the first student with the yarn ball. When you get to the next member, the "aquatic plant," the "river" can roll the ball of yarn if sitting or the teacher can hand the ball of yarn if students are standing. Tell students to gently hold onto a piece of yarn once they have had received the yarn ball and to continue to hold a piece of the yarn until told otherwise.

5. When the story is over and the web is complete, have the students stand (if not already), lifting their part of the yarn so the whole group can see the web at work. Then, as a group, go over the questions provided.

RIVER COMMUNITY STORY

Instructions for Students:

"Imagine that you're no longer in the classroom but outside in the sunshine, surrounded by the smells and sounds of the babbling river. Imagine that you are becoming the part of the river community as what is pictured on your nametag.

I'm going to read a story about this river, which shows how important each member of the river community is to all the other members. As I tell about your part, a classmate or myself will pass a ball of yarn to you. Take hold of the yarn, and when I read the next character, that new person will be given the yarn ball while making sure you gently hold on to a string of that yarn.

Don't let go of your part of the yarn, but hold on to it gently and do not pull."

Interactive Story:

Our community depends on the water from the RIVER. [Hand the ball to the child who is the river.] All of the living things in the area depend on the river as a resource of water, nutrients, and food. It keeps all living things hydrated and helps them survive. Water is essential for life.

The river creates a place for an AQUATIC PLANT to survive. An aquatic plant is a plant that lives and grow in water only, it cannot survive outside of the water. Aquatic plants come in many different shapes and sizes. Aquatic plants provide a great home for INSECTS. Some insects such as dragonflies and blackflies are born and develop in water, but as adults they live on land. Pretty amazing!

Insects in the river are food for lots fish, including SALMON. When salmon are young and growing in the river they eat on insects to help them get big and strong to get ready to go to the ocean. [With older students, see if they can name all five species of salmon found in Alaska: chum/dog, sockeye/red, chinook/king, coho/silver, and humpy/pink.] Salmon provide food for many animals and humans, especially in Alaska. One animal that loves salmon is the BEAR. Both black bears and brown bears enjoy to eat salmon as a tasty treat. Raise your hand if you enjoy eating salmon.

After eating its tasty treat, the salmon scraps that the bears leave behind on river banks are actually very helpful to the SOIL. The salmon scraps bring nutrients to the soil, making if very rich and good for plants to grow; plants like BERRIES can grow near the river banks. [With older students, ask them to name the types of berries found in their community.] Berries, like salmon, are enjoyed by many animals and humans. One type of animal that loves to feast on Alaskan berries are BIRDS.

As the birds are among the berry bushes, they fly from branch to branch enjoying the yummy little fruits. As they are feeding, other animals may be watching close by to try to get a treat of their own. Actually, nearby a FOX is watching the birds as they eat. It is looking for an opportunity to pounce! [For older students, talk about predator vs. prey, have students tell you which is the prey in this story and give you other examples of predators and prey in the wild.] The fox is hiding from the birds by crouching in stalks of FIREWEED. The fireweed help camouflages the fox so it is unseen in its tall stalks.

Two PEOPLE are walking by the river; they scare the fox away and it will have to find a different prey for its meal today. The people are here to pick berries to eat later. They are happy to be near the river where the air is cool and the animals move with activity. Nearby they hear a splash from a fish jumping in the river. They stop for a moment to enjoy this special place and then they continue on picking berries.

[Each child in the circle is now holding part of the yarn, ending with the people member(s) who have entered into the river community. Ask the class to stand up (if not already), being careful not to let go of their part of the yarn. They should continue to stand in the circle through the questions.]

QUESTIONS

1. Look how the web has grown and how many of the strings overlap. Think about the importance of the relationships within the river community. For example, what effect did the people walking through by the river have on the web?

   They scared the fox away and they picked berries.

If the berries are taken from the river community, which other creatures will be affected? [Instruct the student who represents the berries to give his/her string a gentle pull.] Who feels this pull?

The birds and the soil (the birds eat the berries and the plants provide shade for the soil as well as nutrients from decaying leaves).

2. If berries become scarce, where will the birds get its food?

   (Have students name other food options for birds- EX: insects, fish, plants, etc.) If the birds cannot find enough food here, then they might have to leave this river community to find food somewhere else.

   And what other community member needs the birds? [Instruct the student who represents the birds to give his/her string a gentle pull.] Who feels this pull?

   The berries and the fox

3. If birds become scarce, where will the fox get its food?

   (Have students name other food options for foxes- EX: voles, plants, insects, fish, etc.) The fox might need to leave the river community to hunt somewhere else.

   If the fox has to leave, who will it affect? [Instruct the student who represents the fox to give his/her string a gentle pull.] Who feels this pull?

   Birds and Fireweed

   [Emphasize the concept that everything is connected to and needs everything else. The students can continue to pull their strings as the questions are being asked. At times, the teacher may need to cue the students regarding what parts of the river community are affected.]

4. What happens if there is a there is too much pollution in the river and it hurts the salmon population? Who will feel a pull? [Have the students who represents the salmon and the river give their strings a gentle pull.]

   The bear, insects, and the aquatic plant.

   Is there anyone else that salmon is food for? [Have the group brainstorm the other members that eat salmon but aren't necessarily directly connected to them in this web demonstration]

People, birds, foxes [Have students that represent the bear, insects, people, birds, and foxes gently pull their strings]

Lots of river community members would be affected if something were to happen to the salmon. That's why it is very important to protect our river and keep it clean since it is their home.

5. What can we do to protect the river in this story as well as all the rivers?

Answers will vary but may include: put garbage in trash cans, pick up trash if you see it by the river, try to recycle so trash doesn't get into the river, don't use plastic bags to help keep them out of the river, take only the fish we need/don't overfish, etc.

MEASURING LEARNING ACTIVITIES

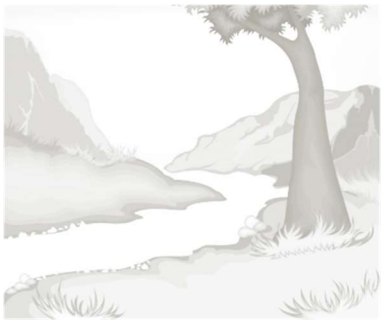
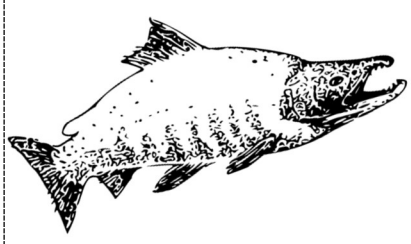
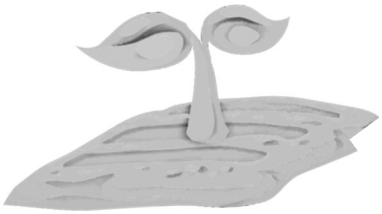
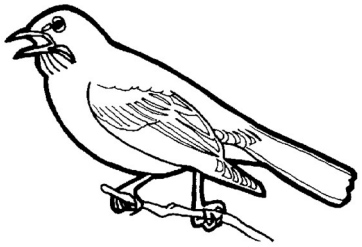
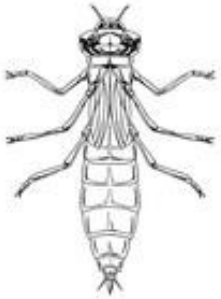
For Lower Elementary:
Have the students recreate a river community web of life by drawing it on a sheet of paper or in a journal. Have the students come up with at least six members (or more if you choose), draw them in a circle formation on their paper, and draw lines to the member that are connected. (If age appropiate, have students write how they are connected. Example: If the line is drawn from an Aquatic Plant to a Moose the student could write "*Moose eats aquatic plant for food."* Make sure connection explanations are accurate.) Encourage students to think of living things in the river community that was not part of the group exercise but if they are having a hard time, have them use examples from the group exercise.

For Upper Elementary:
Now that the students have experienced the river community's web of life, challenge them to look at the webs of other ecosystems. Make sure they know what an ecosystem is. *"An **ecosystem** includes all of the living things (plants, animals and organisms) in a given area, interacting with each other, and also with their non-living environments (weather, earth, sun, soil, climate, atmosphere). In an **ecosystem**, each organism has its' own niche or role to play." [eschooltdoay.com]*

Divide the class into small groups and assign each a different ecosystem that is part of Alaska, such as: fresh water lake, arctic tundra, beach/coastal, mountain, forest, or wetlands. Have the students write a story about the interconnectedness of their assigned ecosystem, using the community members as characters and their assigned ecosystem as a setting. Allow the groups enough class time to research, if needed, and write the story. Select several of the student-written stories to read aloud in class and have the students create a yarn web. As a group, discuss potential threats and then ways to protect each of the ecosystems and the community members within them.

Web of Life River Member Cards

In English

River 	Aquatic Plant 	Salmon 
Bear 	Soil 	Berries 
Birds 	Fox 	Insects 
Fireweed 	People 	

Web of Life River Member Cards
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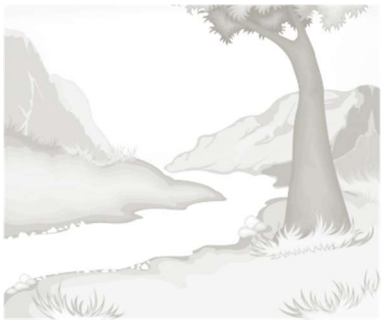
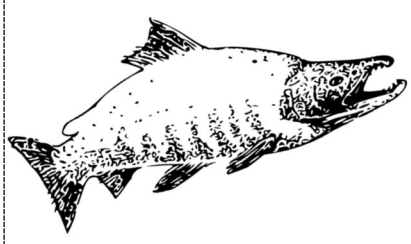
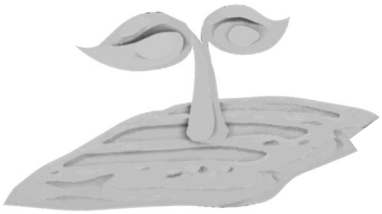
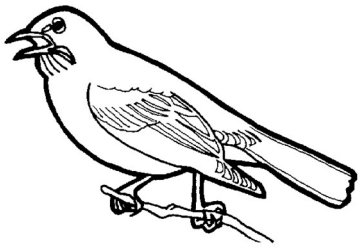
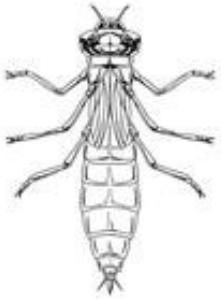
-tl'ot 	netsolaay 	łookk'e 
ses 	łaats 	geege 
tsooye 	naaggedle 	ggoo' 
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Web of Life River Member Cards

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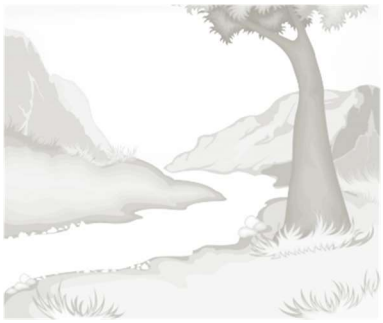
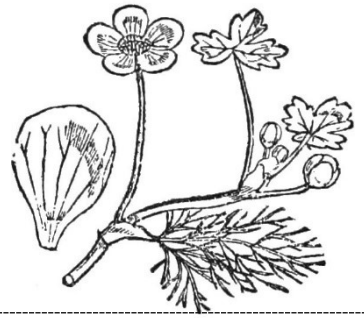
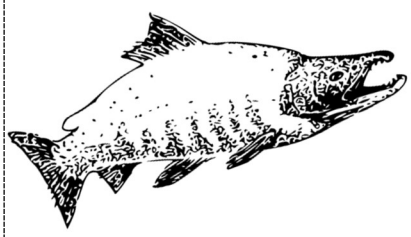
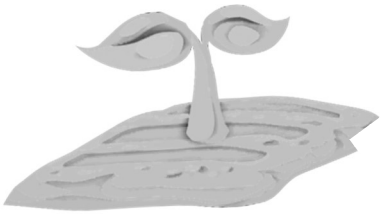
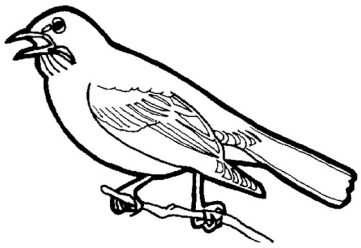
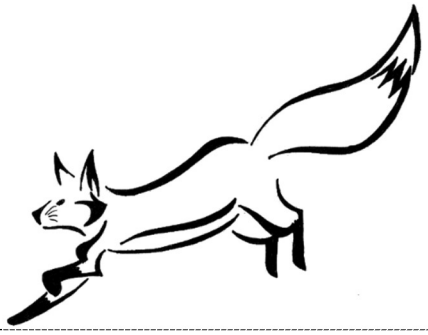
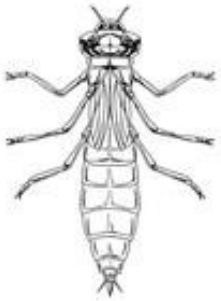
Han 	Gwanzhįh 	Łuk 
Shoh 	Nan 	Jak 
Chiitsal 	Neegǫǫ 	Dąįį 
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Web of Life River Member Cards

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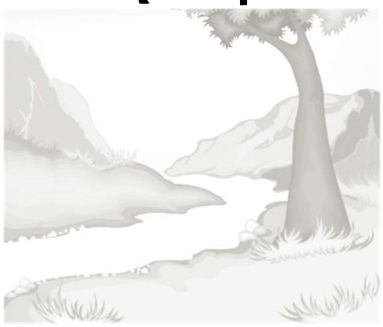
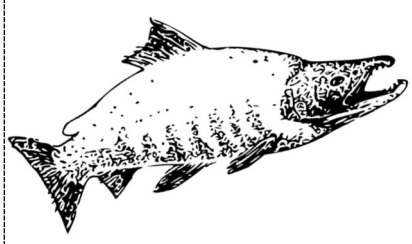
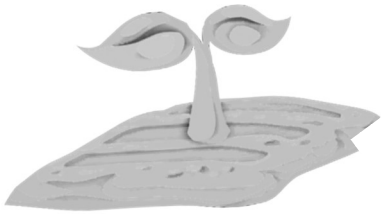
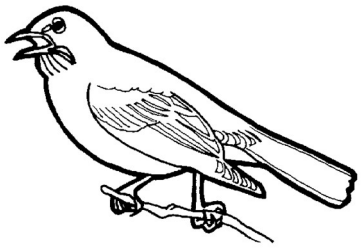
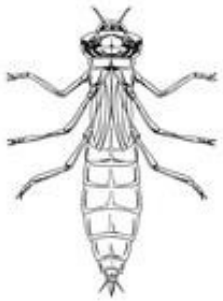
Quiq 	Nouciitat (aquatic) 	Taryaquaq 
Carraiyaq 	Marraiyaq 	Nounvaat 
Yaqulrret 	Kaviaq 	Ciisiit 
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VARIATION:

A Simplified, Group Brainstorming Version-

Have the group of students stand in a circle formation. The instructor will have a ball of yarn and ask a student to volunteer to be the "river" and give that student the end of the yarn to hold. Explain to the group that the river is a very important component to many in Alaska, not just for people but for plants and animals of all sizes as well. Ask the group, "What is something that needs the river in order to live?" Have students raise hands and call on one to answer. If the student gives an answer that is correct, hand them the string while having the "river" gently hold onto the end of the ball of yarn and tell them that they are now what they answered. Now ask the class, "What is connected to [the living thing that was mention] that depends on the river?" Call on a student and then he/she will become the living thing that they answered and they will get the yarn ball while the prior student still gently holds onto the yarn. Keep repeating this by asking students for examples of living things that are connected to each other in the river ecosystem and passing the yarn along to students as they answer, forming a web with the yarn.

Feel free to have the students explain how their answers are connected to the prior living thing that was mentioned. As the instructor, if you feel that their answers are moving away from the river ecosystem, come up with an answer that you feel will help bring the ideas back to the river ecosystem and choose a student to assign your answer to. Have older grades be more specific, for example: If a student answers salmon, have them pick what stage of the salmon life cycle it supports such as an egg, fry, smolt, etc.

Once the web is complete, have the students observe the interconnectedness of the living things they came up with in the river ecosystem. Then, come up with scenarios where the students would see what would happen if one of the living things was negatively impacted. Have the student that is assigned to the living thing in your scenario gently pull their string and those living things that affected will be able to tell by feeling the pull of the string. [Example scenario: The salmon have low population numbers due to a polluted river. Who does this affect? (Have the student that is the salmon gently pull their string and the two living things that they are connected to will become apparent).] Ask the students the following questions: Why it is important to protect the river ecosystem and keep in clean? What are ways that we can keep the river clean in our community?

Sources for this program:

The web of life is a common theme in environmental educations. Variations of this activity can be found in Sharing Nature with Children by Joseph Cornell, Dawn Publications, 1979.

The story, questions, measuring learning activities, and member cards were adapted from Population Connection's Web of Life found at: https://www.populationeducation.org/sites/default/files/web_of_life.pdf.

Images for River Member Cards:

Via Bing Image Search under the Creative Commons license.

Additional Resources:

The Yukon River Inter-Tribal Watershed Council has a vast number of resources available online at www.yritwc.org. For more information, call (907)258-3337.