

**FOOD FROM THE SEA: TIDAL HARVEST GR: PREK-2 (LESSONS 6-9)**

**Elder Quotation:** ‘My grandchildren say they will never eat anything but when I fix it they eat it. I am really pleased. I think that if they had to come out and live with me I would have no problem. I think they would enjoy it. I think they are looking forward to it. I told them I am going back to my old ways. They already have more plans than I have. They are thinking that their grandmother is going to live forever, but I am hoping that I can show them the way that I have lived, and what was caught in them days, and how to cook it, and what to do with it in case they are stranded on a beach someday. I am quite sure that if I got stranded any place I could survive, if a bear didn’t come and chew me up.’

– Jessie Tiedeman<sup>1</sup>

*Jessie Tiedeman was born in Cordova in 1926 and later moved to Tatitlek where she lived a subsistence lifestyle.*

**Grade Level:** Pre K-2

**Overview:** The Sugpiat and Eyak people are coastal peoples who traditionally harvested much of their food from the ocean. This tradition continues in the subsistence lifestyle in which new generations learn to recognize and make use of the ocean’s bounty. Here students locate, harvest, and process tidal foods, notably chitons/bidarkis, snails, and seaweed.

**Standards:**

<i>AK Cultural:</i>	<i>AK Content:</i>	<i>CRCC:</i>
<p><b>C1:</b> Perform subsistence activities in ways that are appropriate to local traditions.</p> <p><b>D1:</b> Acquire in-depth cultural knowledge through active participation and meaningful interaction with Elders.</p>	<p><b>Science C (2).</b> A student should understand and be able to apply the concepts, models, theories, facts, evidence, systems, and processes of life science and should (2) develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms.</p>	<p><b>SS3:</b> Students should be able to gather plants, berries, and other edible foods.</p> <p><b>L1:</b> Students should understand the value and importance of the Sugt’stun language and be actively involved in its preservation.</p>

**Lesson Goal:** To appreciate locally available foods by identifying, harvesting, and preparing tidal foods.

**Lesson Objectives:** Students will:

- Observe how to locate and harvest tidal edibles.
- Discuss how Elder knowledge sustains subsistence practices.
- Identify and process seaweed for consumption.
- Model how tidal edibles inhabit distinct areas in the intertidal zone.
- Learn the Sugt’stun or Eyak vocabulary listed.

**Vocabulary Words:** Sugt’stun Dialects

English:	PWS:	Lower Cook Inlet:	Eyak:
Listen! (Directed to 3+)		<i>Niicugniluci!</i>	

high tide		<i>tung'iq</i>	
low tide		<i>ken'aq</i>	
chiton/bidarki	<i>urritaq (pl:urritat)</i>	<i>urritaq (pl:urritat)</i>	
snail	<i>puk (pl:iput)</i>	<i>ipuk (pl:iput)</i>	
seaweed		<i>caqallqaq</i>	<i>tiishiyah</i> (broad ribbon) <i>iimLxAwah</i> (red ribbon)

**Materials/Resources Needed (per class):**

**Class I:**

- Computer Projection Screen to view YouTube video of bidarki harvest
- Field Trip transportation arrangement
- Field Trip Permission slip, if needed – one per student
- Elder/Recognized Expert to accompany field trip
- Appropriate clothing for field trip including rubber boots
- Camera to record field trip activities
- Gathering tools (knife, scissors) for Elder/Recognized Expert/Teacher to gather seaweed
- Small buckets to hold seaweed samples – one per student
- Gathering containers (boxes, baskets...) to transport seaweed (keeping like with like) back to classroom
- Seaweed field guides
- *Optional:* Thermos of hot water to pour over seaweed

**Class II:**

- Elder/Recognized Expert to describe and demonstrate chiton processing
- Access to hot plate, Stew pot
- Small plates for chiton distribution
- Camera to record class activities

**Class III:**

- Designated area in classroom to store, rinse, and hang up seaweed to dry
- Large buckets for rinsing seaweed
- Drying rack on which to drape seaweed, clean sheet on which to dry seaweed on table
- Floor protection from dripping seaweed
- Camera to record class activities
- *Optional:* Fan to help seaweed dry

**Class IV:**

- Elder/Recognized Expert to supervise seaweed processing
- Tidal Edibles cards
- Access to oven, Roasting pan
- Small plates for seaweed distribution
- Camera to record class activities

### **Kit Library:**

- Garza, Dolores A. *Common Edible Seaweeds in the Gulf of Alaska*
- Garza, Dolores A. *Surviving on the Foods and Water from Alaska's Southern Shores*
- Lindeberg, Mandy R. and Sandra C. Lindstrom. *Field Guide to Seaweeds of Alaska*
- Schofield, Janice J. *Discovering Wild Plants*

### **Web Resources:**

#### Bidarki Harvest

- <https://www.youtube.com/watch?v=in-7B93TQTo> 'Bidarkis: Subsistence Intertidal Harvesting in Alaska' (Port Graham and Nanwalek) (3:09) Opens with close-up of Vera Meganack harvesting bidarki/chiton from intertidal rocks.

#### Bidarki Recipes

- <https://alutiiqmuseum.org/explore/past-exhibits/954-sharing-wild-foods> Preparation of Chitons (Kodiak, 3:10)
- <https://www.youtube.com/watch?v=f0DIjJ6CKIw> Bidarki Salad: Traditional Foods: Contemporary Chef: Aleutians (Sand Point, 5:09 – Alaska Native Tribal Health Consortium) Opens with beach harvest and tasting, in kitchen shows removal of eight back plates)

#### Kelp

- <http://www.deseretnews.com/article/765564563/Kodiak-residents-learn-to-harvest-cook-with-kelp.html> All Kodiak kelp is edible, avoid bull kelp bulb, don't use washed up kelp, could be too old.

#### Subsistence Foods

- <http://www.adfg.alaska.gov/sf/publications/> Stanek, R. T. (1985). *Patterns of Wild Resource Use in English Bay and Port Graham, Alaska* (Technical Paper No. 104). Anchorage, AK: Alaska Dept. of Fish and Game, Division of Subsistence.

#### Teacher Background

<http://aswc.seagrant.uaf.edu/grade-5/investigation-1/bidarki-story-background.html> See: Home/Grade 5/Investigation 1/Bidarki Story – Teacher Background

[http://www.sealaskaheritage.org/sites/default/files/Beach\\_lessons.pdf](http://www.sealaskaheritage.org/sites/default/files/Beach_lessons.pdf) Lesson #9 Chitons – Teacher Background

### **Teacher Preparation:**

#### **Class I**

- Review activity plan and practice Sugt'stun or Eyak vocabulary.
- Decide on local beach to explore for field trip. Consult community members on best location to find varied seaweeds, bidarkis/chitons, and snails.
- Plan and arrange field trip date, transportation, permission slips. Determine appropriate day and time for beach field trip. [Note: An hour before low tide works best. There are significant minus tides in the spring which allow students to see and harvest more.]

- Contact your Local Education Coordinator or local Tribal Council for a list of Elders that could share their expertise on the lesson content.
- Invite an Elder or Recognized Expert to accompany class on field trip to identify edibles and share any stories or memories associated with the harvest, processing, or eating of bidarkis/chitons, seaweed, or snails.
- Before the Elder or Recognized Expert arrives, review with students how to respectfully interact with the Elder during his or her visit.
- Preview YouTube video of bidarki harvest listed above.
- "...intertidal harvest important not only for the food produced but also as a social activity for older people unable to participate in more strenuous and dangerous harvest activities. It was an opportunity to outdoors, and it also allowed older people to teach their children and grandchildren how to use local resources..... Searching for chiton with the aid of a lantern during night time low tidal periods in late fall and winter was a common practice among experienced people." Stanek, R.T. (1985) *Patterns of Wild Resource Use in English Bay and Port Graham, Alaska* (Technical Paper No.104). Anchorage, AK: Alaska Department of Fish and Game, Division of Subsistence, p.162
- "*Chitons are mollusks. Gumboots are one of the largest chitons in Alaska. Tlingit people have eaten steamed gumboots for centuries. Tlingits focus their attention when steaming gumboots. If they are overcooked, they are hard to chew – imagine chewing on a tire. After steaming chitons you run a spoon or knife down the spine to remove the plates. Once the pates are removed run your finger down the spine to remove any remaining shell pieces. Chitons curve their bodies to adapt to the shape of the rocks. They hold to rocks very tightly. It is impossible to pry them off with bare hands; you need a knife to dislodge them. Chitons crawl slowly on their muscular foot. They have eight overlapping plates on their backs and these eight plates are the chitons' shells. These plates allow chitons to roll themselves into balls – protecting them from prey. Chitons are black, red, and brown in color. Some chitons have spots and stripes of many colors.*" – Sealaska Corp. *Ēek Beach Curriculum*, Grade Levels K-1 (See website above)

### **Class II**

- Review activity plan and practice Sugt'stun or Eyak vocabulary.
- Review summary of reasons for bidarki/chiton population fluctuations from Sea Grant website listed above.
- Invite an Elder or Recognized Expert to discuss and demonstrate how to prepare chitons and or snails.
- Assemble materials needed for chiton/snail preparation including utensils, plates, napkins

### **Class III**

- Review activity plan and practice Sugt'stun or Eyak vocabulary.
- Prepare area to store and dry collected seaweed.
- Invite an Elder or Recognized Expert to discuss & demonstrate how to process seaweed.
- *Optional:* Invite Elder/Expert/Community member to share taste of herring spawn on kelp.

### **Class IV**

- Review activity plan and practice Sugt'stun or Eyak vocabulary.
- Invite an Elder or Recognized Expert to accompany class on field trip to identify edibles. Encourage him or her to recall any stories or memories associated with the harvest, processing, or eating of bidarkis/chitons, or seaweed

- Review recipe options in *Common Edible Seaweeds in the Gulf of Alaska* and timing based on seaweeds harvested.
- Arrange access to oven to roast seaweed
- Set out Tidal Edibles and Tidal Recipes cards

**Opening:** Guidebooks and study cards are helpful but it takes actual experience to learn how to find, harvest, and prepare food from the sea. Let's learn how to follow the subsistence lifestyle.

### **Activities:**

#### **Class I – Field Trip**

1. Briefly review some of the sea foods shown and explain that students will take a field trip to look for three tidal foods: chiton/*uhhitaq*; seaweed/*caqallqaq*; and snail/*ipuk*.
2. View YouTube video of bidarki harvest listed above. (3:09)
3. Go on field trip. Bring along Garza's *Surviving on the Foods and Water from Alaska's Southern Shores*<sup>ii</sup> to identify seaweeds.
4. Remind students of beach etiquette. Students should always remain within sight, stay on shore, take care around sharp rocks, and should treat the plant and animal communities they come across with respect.
5. Take photos which emphasize the stage of the tide as reference for final unit display.
6. Invite Elder/ Expert to demonstrate how to find and harvest bidarki/chiton/*uhhitaq*; seaweed/*caqallqaq*; and snail/*ipuk*. As each is located invite the Elder/Expert to demonstrate and discuss how it is prepared and eaten. Listen carefully (*Niicugniliuci!*)! Have students repeat the edibles' names in both English and Sugt'stun or Eyak.
7. Point out the high tide/*tung'iq* and low tide/*ken'aq* marks and the boundaries for student explorations. Allow students time to locate a chiton/*uhhitaq* or snail/*ipuk*.
8. As edibles are found confirm student identifications with the Elder/Expert and talk about the particular beach location for each edible [*near high or low tide marking, under or above rocks...*] If possible, have students taste the bidarkis/chiton.
9. Distribute collection buckets and shovels and challenge students to locate different types of fresh seaweed/*caqallqaq*.
10. As fresh seaweeds (still attached with holdfast) are found confirm the seaweed's freshness and identity. Samples should be harvested by cutting off the top of the frond. Expert Dr. Dolly Garza explains: *When you are collecting, do not take all the seaweeds in one area. Selectively cut or 'thin' seaweeds. Rock should not be left bare of seaweeds, or covered with cut stipes, or you will be destroying important habitat. Few seaweeds will regenerate or grow back from the stipe. Usually the holdfast is encrusted with small shelled animals and is often tough and unpalatable. Leave the lower portion of the frond and holdfast to provide continued habitat for small animals.*<sup>iii</sup>
11. Place rinsed seaweeds in student buckets keeping like with like. Sea Lettuce is so fragile that may be best to wait to rinse it back at school in salted water.  
[Note: Field guide identification is easiest with the color photos in Garza's *Surviving on the Foods and Water from Alaska's Southern Shores*. Essentially all seaweeds are edible, some are just more palatable than others. The only poisonous variety is found in the tropics. As Janice Schofield says, "I know of none that taste good that could be hazardous."<sup>iv</sup>] Return to class with seaweed/*caqallqaq* samples, snails and chitons.

*Optional:* Popweed is one of the most common seaweeds and readily identified by its ‘poppable’ pouches. Dolly Garza suggests having students harvest the tips to avoid the pouches which can be slimy. Blanching the popweed by pouring hot water over it not only rinses off the salt water but produces an instantaneous electric green color which is a real crowd pleaser. The popweed can be eaten then and there.



Popweed

*Optional:* Share harvest “Thank You” song  
*Quyaanaa-naa-naa-ruq, culierat*  
*Quyaanaa-naa-naa-ruq, culierat*

*Auluklluta, nayurlurta, piturcesluta*  
*Una uritaq tuluku, lliiluku qutmen, amlercesluki neqpet*  
*Piturcesluki kukupet, ellitaa kukuit piturcesluki, cali*

*Quyaanaa-naa-naa-ruq, culierat*  
*Quyaanaa-naa-naa-ruq, culierat*

Thank you, please ancestry  
Thank you, please ancestry

Taking care of us, being with us, letting us eat  
This bidarki, take it, put it on the beach, make plenty our food,  
Let our children eat, let their children eat, again

Thank you please, ancestry  
Thank you please, ancestry

Lydia Robart, Port Graham Elder, 1947-2001<sup>v</sup>,  
Translated by Becky Norman, *Imam Cimiucia: Our Changing Sea*, p.78

## **Class II – Chitons and Snails**

1. Review vocabulary words for snail/*ipuk* and chiton/*urritaq* and where and when (low tide/*ken'aq*) they were harvested.
2. Describe how scientists and Elders worked together to understand how the availability of snails/*iput* and chitons/*urritat* has varied over the years.
3. Invite Elder/Expert to share memories of how chiton and snail harvests have changed in his or her lifetime. Remind students to listen carefully (*Niicugniluci!*).
4. Have Elder/Expert prepare and cook chitons/*urritat* and/or snails/*iput*.
5. Share Jessie Tiedeman quote about preparing bidarkis or 'gumboots' as she called them:  
*"I was taught to take cold water and put your gumboots in and let them come to a boil. As soon as they come to a boil, you got to have a mallet or a stick to squish and stir them around. When the black skin starts falling off that is a sign you gotta take them out. If you boil them too long they get tough. Your dad used boiling water and he says they were tough. It just takes a few minutes."* - Jessie Tiedeman<sup>vi</sup>
6. Distribute cooked chiton/*uhhitaq* and or snail/*ipuk* and invite student comments. How important was it for an Elder to help them?
7. Photograph students observing food preparation and trying same for final unit display.

## **Class III - Seaweed Drying**

1. Review with students the various types of seaweed/*caqallqaq* harvested on the field trip during low tide/. Explain that most seaweed aside from popweed (*fucus*) may be dried and used throughout the year as snacks and seasonings.
2. Check that seaweeds are adequately rinsed and help students to arrange seaweed to dry in the sun according to type as described in *Common Edible Seaweeds in the Gulf of Alaska*. Most can be placed on a table covered with an old clean sheet or, in the case of large brown seaweeds, hung from clotheslines.
3. Share quote from Jessie Tiedeman about seaweed preparation:  
*"My grandfather used to get seaweed.... I had seen my grandfather out at Makarka Point. He would pick it out of the water and drape it over the fence and let the sun dry it out. He would get a little smoke and smoke it. Then he would roll it up and chop it real fine. He would pack it in kegs with seal oil and he would put the cooked cockles on top. He would preserve it for the winter. In the winter time you would take that seaweed with the cockles and maybe get your smoked salmon. It was really a treat, you know, to eat smoked salmon. You would get the kelp too."*  
- Jessie Tiedeman<sup>vii</sup>



Seaweeds

4. Photograph students hanging/placing seaweed/*caqallaq* to dry for final unit display.
5. Identify seaweeds with a marker and masking tape 'labels.'

[Note: Garza observes that “as seaweeds dry you may see a powdery substance appear. The white powder is likely to be a salt or a sugar and is perfectly edible.”<sup>viii</sup> ]

*Optional*: Invite Elder/Expert/Community member to share taste of herring spawn on kelp.

#### **Class IV – Seaweed Roast**

1. Review seaweed/*caqallaq* types harvested and choose one to process by roasting according to directions in *Common Edible Seaweeds in the Gulf of Alaska*.
2. Invite Elder/Expert to describe identification and roasting process and to share any stories of how he or she learned to process and use seaweed/*caqallaq*. Listen (*Niicugniliuci!*)
3. Roast seaweed/*caqallaq* in oven for designated time.
4. Photograph roasting process for final unit display.
5. While seaweed is roasting review field trip experience with students and recall how many different tidal edibles were found.
6. Divide students into small groups and distribute Tidal Edibles cards. Challenge students to find the *bidarki/chiton/uhhitaq*; seaweed/*caqallqaq*; and snail/*ipuk* cards.
7. Discuss as a class: In what parts of the beach were the edibles found? Do students know or remember what use is traditionally made of these edibles? Were there still more foods to be found on the beach? [*Direct students to look at other Tidal Edibles cards.*] How did all these tidal foods help the Sugpiaq and Eyak peoples to decide that this was a good place to live? (*Lots of food available in places easy to reach – the beach.*)





Tatitlek from the Beach: Photo Courtesy of Leona Olsen

8. Divide the classroom into a giant 'beach' with the two intertidal zones: high tide/*tung'iq* and low tide/*ken'aq*, and half-tide. Distribute Tidal Edibles cards and challenge students to place them in their correct intertidal zone.
9. Distribute Tidal Recipe cards to small groups and challenge students to describe foods made with these subsistence resources.
10. Distribute roasted seaweed/*caqallaq* and invite student comments.
11. Photograph students trying seaweed for final unit display.
12. Which type of seaweed/*caqallaq* is most popular? How might it be used in recipes?

#### Assessment:

- Students observed an Elder/Expert locate tidal edibles.
- Students located and harvested tidal edibles.
- Students identified and processed seaweed for eating.
- Students matched tidal edibles with their distinct intertidal habitats.
- Students correctly pronounced the Sugt'stun or Eyak vocabulary.

<sup>i</sup> Jessie Tiedeman (Interview D. Kramer pp57-66). *Out of Our Time: The Storytellers: Oonechguk Edowchu*. Cordova High School Discovery Program, 1980. p.63 (Out of print)

<sup>ii</sup> Garza, Dolores A. *Surviving on the Foods and Water from Alaska's Southern Shores*. Alaska Sea Grant, University of Alaska Fairbanks, 2007.

<sup>iii</sup> Garza, Dolores A. *Common Edible Seaweeds in the Gulf of Alaska*. Alaska Sea Grant, University of Alaska Fairbanks, 2012. p.6

<sup>iv</sup> Schofield, Janice J. *Discovering Wild Plants*. Portland, Oregon: Alaska Northwest Books, 2011. p. 250

<sup>v</sup> Salomon, Anne K., et al., *Imam Cimiucia = Our Changing Sea*. Alaska Sea Grant College Program, 2011. p.78

<sup>vi</sup> Jessie Tiedeman p.66

<sup>vii</sup> Jessie Tiedeman p.65

<sup>viii</sup> Garza, Dolores A.(2012) p.7



Irene Hanson clamming in Cordova: Photo courtesy of Native Village of Eyak