

**Tlingit Name:** \_\_\_\_\_

**English Name:** \_\_\_\_\_





**Tlingit Name:** \_\_\_\_\_

**English Name:** \_\_\_\_\_





Lesson 4 Student Page  
Exposed Shoreline Picture



Lesson 4 Student Page  
Exposed Shoreline Picture



Lesson 4 Student Page  
Protected Shoreline



Lesson 4 Student Page  
Protected Shoreline





# Héen Táanáx̄ Kayaaní Dísi: Laak'ásk ka K'aach

*Plants that grow in the water month:  
Black Seaweed and Red Ribbon Seaweed*



A Literacy and Science Unit  
Grades 6-8

# Overview

This place-based unit explores indigenous seaweed and the historical and contemporary value of seaweed to the Tlingit people. The unit begins with the oral narrative *Raven and the Tides*. This story explains how Raven released the tides so that beach foods became available for all. During this unit students identify the nutritional value of seaweed and develop an enduring understanding for how people who harvest marine life are part of an interconnected system. During this unit, students learn how understanding the structure and function of seaweed leads to respectful harvest techniques which the Tlingit people have used for centuries. Students also learn different techniques for preserving seaweed. This unit integrates literacy strategies to help students increase competency in reading, writing, listening and oral language.

## Why Use Oral Narratives?

Tlingit oral narratives contain many layers which enrich our knowledge and imagination. On one level, these stories are great entertainment. Some Tlingit narratives, like the one in this unit, explain how aspects of our world came to be. Other oral narratives relate epic adventures of specific clan ancestors. Stories involving Raven often include humorous exploits which may lead us to reflect upon respectful treatment of others. However, oral narratives were not told solely for entertainment.

In the past, oral narratives were used to convey many forms of knowledge. They taught about place names, property, geography and science. From these stories, younger generations would learn about food preparation, the ebb and flow of the tides, and behavioral patterns of hunted mammals. Many of these stories assisted in the teaching of life skills such as navigation and obtaining food from the land. In addition, oral narratives were used to convey traditional values and social responsibility: They explore human nature and may involve concepts of identity, alienation and isolation, coming of age, loyalty, pride, loss, and other conflicts humans experience throughout life. These stories are spiritual, intellectual gifts which have been passed down from esteemed ancestors.

Like all good literature, Tlingit oral narratives can be used to enhance content learning in the classroom. These stories can be used as a springboard to teach history, geography, science, mathematics, Tlingit heritage language, reading, writing and more.

**Note:** *Tlingit oral narratives are the property of specific clans. For many stories, permission is needed before they are used in the classroom. Permission was granted to use *White Raven and Water* within the context of this unit*



## Tlingit Educational Significance

- Seaweed is one nutritious Tlingit food.
- Gather only what you are able to use/care for.
- Generosity is demonstrated through sharing food.
- Tlingit historical use of science ensured survival.

## Elders & Cultural Specialists in the Classroom

Students benefit from listening to elders and/or cultural specialists. An elder or cultural specialist should be invited to tell the oral narratives and to share knowledge as outlined in the lesson plans. If the elder/culture bearer is a heritage language speaker, they might also teach heritage vocabulary and phrases related to seaweed and the tides. In addition, sharing personal stories about harvesting and preparing traditional foods would be of benefit.

## Assessments

This unit begins with a pre-assessment and ends with a post-assessment. Students are evaluated on how well they answer the essential questions. Journal prompts are used throughout as a formative assessment and should be reviewed by teacher regularly in order to check for student understanding.

## Essential Questions

- ***What is the value of seaweed to me?***
- ***What is the value of seaweed to the Tlingit people?***
- *What is a mindful harvest and why is this important?*

## Enduring Understandings

- *Seaweed is a nutritious local food which has been consumed by humans for thousands of years.*
- *Traditional Tlingit harvesting techniques reflect respect for nature and scientific understanding.*
- *Tlingit people knew/know the science of food preservation and the value of sharing foods with others.*

## Standards Addressed in this Unit

### Alaska English Language Arts Standards Grade 5

#### Writing

**W.5.4.** Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

**W.5.5.** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 5.)

**W.5.10.** Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

#### Language

##### Vocabulary Acquisition and Use

L.5.6. Acquire and accurately use grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., *however, although, nevertheless, similarly, moreover, in addition*).

#### Reading: Informational Text

##### Key Ideas and Details

RI.5.2. Determine the main idea and subtopics of a text and explain how they are supported by key details; paraphrase or summarize key ideas, events, or procedures including correct sequence when appropriate.

#### Reading: Literature

##### Key Ideas and Details

RL.5.2. Determine a theme or author’s message or purpose of a story, drama, or poem using details and evidence from the text as support, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize main ideas or events, in correct sequence.

#### Speaking & Listening

##### Comprehension and Collaboration

SL.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others’ ideas and expressing their own clearly.

b. Follow agreed-upon rules for discussions and carry out assigned roles.

### Alaska State Standards

#### English Language Arts

**A.4** write and speak well to inform, to describe, to entertain, to persuade, and to clarify thinking in a variety of formats

**A.5** revise, edit, and publish the student's own writing as appropriate;

**A.6** when appropriate, use visual techniques to communicate ideas; these techniques may include role playing, body language, mime, sign language, graphics, Braille, art, and dance;

### **Geography**

**A.1** use maps and globes to locate places and regions.

### **Cultural, Social, Personal Perspectives and Science**

**F.2** develop an understanding that some individuals, cultures, and societies use other beliefs and methods in addition to scientific methods to describe and understand the world; and

**F.3** develop an understanding of the importance of recording and validating cultural knowledge.

### **Cultural Standards**

**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.2** understand the ecology and geography of the bioregion they inhabit.

## **English Academic Vocabulary**

- algae
- anatomy
- blade
- harvest
- holdfast
- intertidal zone
- oral narrative
- stipe

## **Tlingit Vocabulary**

- Laak'ásk
- Káach



## Suggested Pacing Guide

Lesson Title	Description	Session Length	# of Sessions
1 Introduction Pre-assessment	Students share prior experience with harvesting traditional foods in SE Alaska and complete a pre-assessment on seaweed harvesting, anatomy, and value as a food source.	30 - 45 minutes	1
2 Raven creates the Tides	Students develop understanding of Tlingit oral narratives and practice listening with respect when an elder tells a story. Students identify traditional Tlingit tidal foods by season using a Tlingit harvest calendar. Students identify when seaweed is harvested in SE Alaska.	45 - 60 minutes	2 Elder or Specialist Visit
3 Seaweed Nutrition	Students identify the nutritional value of seaweed and learn how to decipher nutrition labels. Students learn about beneficial nutrients and their role in healthy bodies.	45 - 60 minutes	1-2
4 Intertidal Seaweed	Students learn where red and black seaweed grow along the intertidal zones of exposed and protected shorelines.	45 - 60 minutes	1
5 Seaweed Anatomy	Students identify the structure and function of seaweed.	45 - 60 minutes	1-2

6 A Mindful Harvest	Students learn how the structure and function of seaweed leads to a respectful harvest embraced by traditional Tlingit values.	45 – 60 minutes	2 Elder or Specialist Visit
7 Drying Seaweed	Students learn traditional and contemporary methods for preserving seaweed.	45 – 60 minutes	4 – 5 Elder or Specialist Visit
Family Night: Sharing Seaweed	Students learn the value and purpose of sharing food with others.	45 – 60 minutes	1 Elder /Family Visit
<b>Total Class Sessions</b>			<b>14-15</b>

## Lesson 1 *Introduction and Pre-assessment*

<b>Purpose:</b>	To identify student prior experiences with harvesting traditional foods in SE Alaska; to assess student prior knowledge with seaweed harvesting, anatomy, and value as a food source.	
<b>Essential Question:</b>	<i>What is the value of seaweed to me/Tlingit people?</i>	
<b>Alaska Standards:</b>	L.5.6; D.3, E.2	
<b>Objectives:</b>	<ul style="list-style-type: none"> <li>• Students record the meaning of the word <i>harvest</i>.</li> <li>• Students identify any local foods they may have harvested and the time of year they were harvested.</li> <li>• Students complete to best of their ability a written pre-assessment.</li> </ul>	<b>Assessments:</b> <ul style="list-style-type: none"> <li>• <b>Whole Group Pre-assessment:</b> Teacher creates a chart of foods students have harvested including the time of year.</li> <li>• <b>Individual Pre-assessment:</b> Students write what they think they know on EQ, seaweed anatomy, and respectful harvest.</li> </ul>

**Duration:** 30 minutes

### Materials

- Student Page: *Pre-Assessment*
- Student Page: *Picture of red seaweed*
- Student Page: *Picture of black seaweed*
- Chart paper or white board
- Student journals or notebooks

### Vocabulary

- Harvest *To gather, catch or kill wild foods for human use*
- laak'ásk black seaweed
- Káach red seaweed

### Procedure

<b>Step 1</b>	<b>Assessing Background Knowledge</b>	<b>10 minutes</b>
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#### Pre-Assessment

##### Whole Group Discussion:

The purpose of this whole group assessment is to uncover the level of experience; students already have with harvesting local foods. Simply record what they share without correction. Later in the unit students will revisit this chart as they learn new information.



Write “harvest” on the board and ask students what they think this words means. Discuss the difference between harvesting crops and harvesting wild foods. Let kids know they will use the definition of harvest as it applies to wild foods. Provide the following definition and have students record it in their notebooks:

Harvest: *To gather, catch or kill wild foods for human use.*

Next, ask the following questions and chart student answers on chart paper using a T chart:

- Have you ever harvested wild foods in Juneau/SE Alaska?
- What did you harvest? When did you harvest these foods?
- How many of you have harvested seaweed? Tasted locally harvested seaweed?
- What are some other wild foods we can harvest here in Juneau/SE Alaska?

Wild Foods	Time of Harvest (Season or month)

**Step 2** **Assessing Background Knowledge** **15 minutes**

Pre-Assessment

Let students know they will be learning more about one wild food that is harvested in SE Alaska: Seaweed. But first they will take a pre-test to see what they might already know.

Let them know they will take a test twice- once at the beginning of the unit and once at the end- and they will compare their answers to see how much they have learned.

Pass out the pre-assessment and allow students time to complete to best of their ability. Emphasize it is okay if they do not know the answers because they will be learning the content over the next few weeks. Encourage them to try their best.

**Step 3** **Closing** **5 minutes**

Let students know they will be learning more about one traditional food that Tlingit people harvest in SE Alaska: seaweed. Provide each student with *Student Page: Picture of Red Seaweed* and *Student Page: Picture of Black Seaweed*. Have students label both with the Tlingit and English name and attach into notebooks/journals.

laak’ásk	black seaweed
Káach	red seaweed

Lesson 2 ***Raven Creates the Tides*** (2 sessions)

<b>Purpose:</b>	To develop student understanding of Tlingit oral narratives; to practice listening with respect when an elder tells a story; to identify traditional Tlingit tidal foods by season using a Tlingit harvest calendar.	
<b>Essential Question:</b>	<i>What is the value of seaweed to me and the Tlingit people?</i>	
<b>Alaska Standards:</b>	L5.6; RL5.2; RI5.2; D3; E2; F2	
<b>Objectives</b>		<b>Assessments</b>
<ul style="list-style-type: none"> <li>• Students demonstrate respect while listening to an elder.</li> <li>• Students record the meaning of “oral narrative”.</li> <li>• Students identify Tlingit beach foods.</li> <li>• Students identify when seaweed is traditionally harvested.</li> </ul>		<ul style="list-style-type: none"> <li>• Teacher observation</li> <li>• Journal Response</li> </ul>

**Duration:** 45 – 60 minutes (This lesson will require 2 class sessions)

**Elder or Cultural Specialist Visit**

- Plan ahead to have an elder or cultural specialist come to the class to share the story of Raven and the Tides. Also let the elder know ahead of time that you will be asking the following questions:

What is the value of this story to the Tlingit people?

What is the value of traditional foods to the Tlingit people?

**Materials**

- Student Page: *Raven Creates the Tides*
- Student Page: *Tlingit Oral Narratives*
- Student Page: *Tlingit Harvest Calendar*
- Student Notebooks/journals
- Student Page: *Tsimshian Raven Tide Story*

**Vocabulary**

- oral narrative

***Raven Creates the Tides (Session 1)***

**Procedure**

**Step 1**

**5 minutes**

Gather Students:

Set Purpose for Lesson:

During our last session (pre-assessment) we discussed our experiences with harvesting wild foods in SE Alaska. We will look more closely at what wild foods the Tlingit people harvest from our tidal zones and we will begin to gather information to help us better answer the essential question:

*What is the value of seaweed to me/Tlingit culture?*

<b>Step 2</b>	<b>Building Background Knowledge</b>	<b>10 minutes</b>
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Let students know they will hear an oral narrative today.

Write *oral narrative* on the board and ask students what they think the word might mean.

Have students record the “oral narrative” in their notebooks/journals and explain the following:

Oral= spoken

Narrative= story

- Oral narratives are the stories people tell rather than write down.
- They are passed down from one generation to the next.
- They survive because families/clans keep the stories alive by telling them over and over.

Have students record the definition in their notebooks. Let them know that Some Tlingit oral narratives are thousands of years old and they will hear one today from an elder.

<b>Step 3</b>	<b>Building Background Knowledge</b>	<b>45 minutes</b>
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Elder Visit:

**Before the Visit**

Discuss with students how to listen with respect to an elder. Emphasize the following:

Be calm in mind, body and spirit

Be quiet and still with an open heart

Hold off on questions or comments until the elder is finished

**During the Visit:**

Elder will tell the Raven and the Tides story

Students Listen to the story with respect

When the elder is finished ask the following questions:

What is the value of this story to the Tlingit people?

What is the value of traditional foods to the Tlingit people?

Thank the elder for coming

**After the Visit:**

Have students read the *Student Page: Tlingit Oral Narratives*. Discuss how oral narratives can take different forms.



## ***Raven Creates the Tides (Session 2)***

### **Procedure**

<b>Step 1</b>	<b>Review Prior Learning</b>	<b>15 minutes</b>
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Review the story:

Oral reading: Pass out copies of the Raven Tide Story to students. Explain that when an oral narrative is written down it becomes “frozen in time” and since you can read it- it will be the same version of the story. When stories are told- the oral narratives changes each time it is told- depending on who is telling the story and for whom. So the written version may be a little different from the version the elder shared.

Student volunteers read aloud. Or you may choose to pair students up and they take turns reading aloud to each other.

Discuss the story:

Why do you think this this story important?

What does this story explain?

Discuss the elder visit:

What is the value of this story to the Tlingit people?

What is the value of traditional foods to the Tlingit people?

Pose question:

What foods did Raven make available to people?

What are some wild foods we can harvest from the beach?

Tell students they will do research to find out what foods are harvested from the beach.

<b>Step 2</b>	<b>Building Background Knowledge</b>	<b>30 minutes</b>
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Whole Group:

Pass out the Student Page: Tlingit Harvest Calendar

Ask students what they notice about the chart. Accept all answers.

Point out the features of the chart; how the chart is organized; how to read the chart.

Ask: What are the traditional foods that Tlingit people harvest from the beach?

Small Group:

Using the Harvest calendar have students work in pairs or individually to create a chart which lists the foods by season. You can let students create their own chart or provide the following for those who need help:

Spring	Summer	Autumn	Winter	All Seasons

When students finish refer back to the harvest foods students listed during lesson 1 (on chart paper) from lesson 1 and add new information.

### Step 3

### Closing & Assessment

10 minutes

Introduce students to the Tlingit Phrase: ***When the tide is out the table is set***

- Write the phrase on the board and ask students what they think the phrase means
- Emphasize: Many traditional Tlingit wild foods are beach foods. When the tide is low these foods are exposed to the air and can be harvested.
- Point out when seaweed is available for harvest.

### Journal Response

What did Raven do for the people?

When is seaweed available for harvest?

### Extensions

1. Students read the Tsimshian version of the story and compare to the Tlingit version using a Venn diagram or other graphic organizer.

## Lesson 3 *Seaweed Nutrition*

<b>Purpose</b>	To introduce students to the nutritional value of seaweed	
<b>Essential Question:</b>	<i>What is the value of seaweed to me/Tlingit culture?</i>	
<b>Alaska Standards:</b>	L5.6; SL5.1; E2	
<b>Objectives</b>	<b>Assessments</b>	
<ul style="list-style-type: none"> <li>• Students read nutrition labels and articles to identify the nutritional value of seaweed.</li> <li>• Students compare the health benefits of seaweed to a Big Mac.</li> </ul>	Journal Response	

**Duration:** 45 – 60 minutes (1-2 sessions)

### Materials

- Dried black and/or red ribbon seaweed (if possible)
- Student Page: *Seaweed Nutrition Articles*
- Student Page: *Get Your Facts Straight (Adapted from the following website)*  
[http://kidshealth.org/kid/stay\\_healthy/food/labels.html#](http://kidshealth.org/kid/stay_healthy/food/labels.html#)
- Student Page: *Seaweed Nutrition Facts*
- Student Page: *How Nutritious is a Big Mac?*

### Vocabulary

- **minerals:** *Nutrients found in foods which are vital to health. Calcium, iron, potassium and zinc are minerals.*
- **protein:** *A naturally occurring substance found in animal products and some plant products*
- **traditional foods:** *The foods which reflect cultural inheritance; foods which belong to local food habitats.*
- **vitamins:** *The various organic substances which are essential for healthful nutrition. Vitamin C, vitamin B1 and vitamin A are found in seaweed.*
- **Nutritious:** *having substances that a person needs to be healthy and grow properly.*

### Procedure

<b>Step 1</b>	<b>Activating Prior Knowledge</b>	<b>5 minutes</b>
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Revisit Prior Learning:

Review the traditional foods chart from previous lesson.

Tell students these foods are very nutritious.

Activating Prior Knowledge:

Ask students what nutritious means.

Ask students to name some nutritious foods they eat.

Provide the definition and have students record the word/definition in their notebooks:

**Nutritious:** *having substances that a person needs to be healthy and grow properly*

Set Purpose for Today's Lesson:

Tell students they will learn why seaweed is a nutritious food.

<b>Step 2</b>	<b>Building Background Knowledge</b>	<b>20 minutes</b>
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Pass out Student Page: Seaweed Nutrition Articles.

Depending on the reading levels of your students- you may choose to read this out loud and discuss as you go or have small groups read the articles together.

During Reading:

Ask students to identify the substances that make seaweed nutritious and to record these words.

After Reading:

Make a chart of the nutritional value of seaweed with student input.

<b>Step 3</b>	<b>Building Background Knowledge</b>	<b>20 minutes</b>
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**For Background Information on Nutrition Facts Labels:**

Pass out Student Page: Get Your Nutrition Facts Straight

Read the first page or have students read independently.

Then guide them through the worksheet helping them to understand the Nutrition Facts label.

<b>Step 4</b>	<b>Building Background Knowledge</b>	<b>30 minutes</b>
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**Comparing Seaweed to a Big Mac**

Pass out Student Page: How Nutritious is a Big Mac and help students complete the questions.

Discuss the health benefits of eating traditional foods such as seaweed versus Bog Macs. Points to discuss:

- Processed vs. local wild foods
- Eating processed foods in moderation
- Eating an abundance of local unprocessed foods.

Allow students to taste/eat seaweed if it is available.

<b>Step 5</b>	<b>Closing &amp; Assessment</b>	<b>5 minutes</b>
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Journal Response (Assessment)

Prompt: What is the value of seaweed to me?

Lesson 4 ***When the tide is out the table is set- with seaweed!***

<b>Purpose</b>	To develop understanding of where red and black seaweed grow in the intertidal zone.	
<b>Essential Question:</b>	<i>What is the value of seaweed to me/Tlingit culture?</i>	
<b>Alaska Standards:</b>	D3; E2;	
<b>Objectives</b>		<b>Assessments</b>
<ul style="list-style-type: none"> <li>• Students will interpret tidal zone diagrams.</li> <li>• Students will identify where black and red seaweed grows along the intertidal zone.</li> </ul>		Journal Response

**Duration:** 45 – 60 minutes

**Materials**

- Student Page: Where is Seaweed?
- Student Page: Dolly Garza Seaweed Biobands
- Student Page: Pictures of Protected and Exposed Shorelines
- Student Page: Exposed Shoreline Diagram
- Student Page: Protected Shoreline Diagram
- Student Page: Tlingit Harvest Calendar
- Blue or green construction paper for each student

**Vocabulary**

- **Intertidal Zone**

**Procedure**

<b>Step 1</b>		<b>5 minutes</b>
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1. **Revisit Previous Learning:**  
Review how Raven is the reason tidal foods are available to humans.



Review when seaweed is ready to harvest: Spring

Emphasize how the months May – June is a rough guideline. Each year winter weather patterns affect spring growth. Depending on the length of the winter season, spring can arrive earlier or later. Tlingit experiential knowledge relied on seasonal observation of ecosystems as the following quote demonstrates:

*“When alder leaves are fully grown, it is time to go after laak’ásk for winter use. It is dried, put up in square cubes with layers of leaves in between to keep it from sticking. This also added natural flavor, the leaves of alder” - Henry Katasse. Our Food is Our Tlingit Way of Life: Excerpts From Oral Interviews, page 21)*

**2. Set Purpose for Today’s Lesson:**

Today we will begin learning more about where Black and Red Seaweed grow.

Ask: **Where might we find red ribbon and black seaweed?**

If there are students who have experiential knowledge with harvesting seaweeds, allow them to share this knowledge. Other students will most likely mention the beach. Tell students that seaweed grows along different types of beaches/shorelines in SE Alaska in the **intertidal zone**.

Define **“intertidal zone”** as: *the area of the shoreline which is above the low tide mark. This area is sometimes under water and sometimes exposed to the air depending upon the tide.* Have students add **intertidal zone** to their notebooks with the definition.

Pass out student page: Dolly Garza Seaweed Biobands  
Read it with students and discuss.

<b>Step 3</b>	<b>Building Background Knowledge</b>	<b>30 minutes</b>
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1. Remind students of the saying, **“When the tide is out the table is set”**. Ask: How far out does the tide need to be so that we can harvest red and black seaweed? Let students know they will use diagrams to help answer this question.
2. Pass out or show the pictures of Exposed and Protected shorelines. Discuss the differences between the pictures. Students should notice the difference in wave action along the shorelines. Have students read the student Page: *Where is Seaweed?*
3. Pass out Student Page: **Exposed Shoreline Diagram** and explain how to interpret:
  - This is a diagram of an intertidal zone of an exposed shoreline.
  - The viewpoint is an underwater cross section of the rocky shore.
  - The diagonal line along the right side of the diagram is the rocky shoreline.

- The creatures that appear to be floating at different levels in the ocean water do not really float around like that. In reality those organisms would be attached to the rocks or the sea floor.
  - The numbers along the sides measure the water level or tide line. The higher the number, the more water is covering the rocks. The lower the number means more of the rocky shore is exposed to the air.
  - FT stands for “Foot Tide”. The numbers along the left side of the diagram measure the tide using the English customary unit- feet.
  - M stands for meters. The numbers along the right side of the diagram measure the tide using the metric system.
  - A plus sign (+) indicates the tide is above zero. A minus sign (-) indicates the tide is below zero.
  - The algae “belts” are the areas where the different seaweeds grow along the rocks forming distinct belts or bands visible at low tides.
4. Pass out the construction paper and tell students to cover the ***Exposed Shoreline Diagram*** with the construction paper. Tell students that the construction paper represents the ocean water and have them slide the construction paper down the diagram stopping at +19 FT.
  5. Ask: ***What is exposed to the air at a 19 foot tide?*** (Black Seaside Lichen)

Tell students on this diagram the area from +19 and above is called the Splash Zone.
  6. Tell students to slide the construction paper down the diagram again until it reaches the +15 FT line. Ask: ***What is exposed to the air at a 15 foot tide? Which of these organisms are Tlingit foods?*** (Limpets) Tell students the area between +15 Ft and +19 is the High Intertidal Zone (High Tide).
  7. Tell students to slide paper to +1FT; tell students the area between +1FT and +15Ft is the Mid Intertidal Zone (Mid Tide). Ask: ***What is exposed to the air at a 1 foot tide? Which of these organisms are Tlingit foods?***
  8. Tell students slide paper to -2FT; identify the foods exposed; tell students the area between -2Ft and +1Ft is the Low Intertidal Zone (Low Tide). Ask: ***What is exposed to the air at a 15 foot tide? Which of these organisms are Tlingit foods?***
  9. Show students the area below the -2Ft and explain that this area is always covered in water. Tell them this is the Sub-tidal zone. Ask: What food is available in the sub-tidal zone? (abalone)

10. Ask students: **Where does black seaweed grow?** guide them to use the diagram to locate black seaweed. They should note that it grows between +1 and +11 foot tide in the mid intertidal zone along exposed shorelines.

11. Pass out the Student Page: **Protected Shoreline Diagram** and have students locate “Ribbon Kelp” which is another name for Red Ribbon seaweed. Where does seaweed grow along the shoreline? Red Seaweed grows along **semi-exposed** and **semi-protected shorelines** at the **mid to low intertidal zone**.

<b>Step 4</b>	<b>Closing &amp; Assessment</b>	<b>10 minutes</b>
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Emphasize:

Low tides are important because when the tide is out, or low, many foods are exposed. Seaweed is one of the foods you can harvest during low tides.

Journal Response (Assessment)

Students record complete sentences in their notebooks to answer the following:

- Where does black seaweed grow?
- Where does Red Ribbon seaweed grow?

### Extensions

Teach students to use a tide book.

Have students locate the next best tides for harvesting black and red seaweed.

## Lesson 5 **Seaweed Anatomy**

<b>Purpose</b>	To introduce students to the structure and function of seaweed.	
<b>Essential Question:</b>	<i>What is the value of seaweed to me/Tlingit culture?</i>	
<b>Alaska Standards:</b>	L5.6; RI 5.2; F.2; F.3	
<b>Objectives</b>	<b>Assessments</b>	
<ul style="list-style-type: none"> <li>• Students observe and create scientific illustrations of local seaweed.</li> <li>• Students apply reading strategies to learn about the structure and function of seaweed.</li> <li>• Students identify 3 main parts of seaweed.</li> </ul>	Journal Response	

**Duration:** 45 – 60 minutes (1-2 sessions)

### Materials

- Student Page: *Learning about Seaweeds*
- Student Page: Seaweed Structure and Function
- Seaweed samples if available (for observation)

### Vocabulary

- **algae:** *aquatic organisms which lack the complex roots, stems, branches, and leaves of most land plants.*
- **blade:** *the flattened leaf-like part of seaweed.*
- **holdfast:** *the part of seaweed that attaches to the rock or ocean floor.*
- **midrib:**
- **stipe:** *the part of the seaweed between the blade and the holdfast. It holds the blade up into the sunlit water.*
- **thallus:** *the entire body of the seaweed.*
- **seaweed:** *macroscopic (large) algae. Not a true plant.*

### Procedure

<b>Step 1</b>	<b>Activating Prior Knowledge</b>	<b>5 minutes</b>
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#### Revisit Prior Learning:

Seaweed is found all over the world.

Different types of seaweed grow at different locations along the intertidal zone.

Red Ribbon seaweed grows along exposed shorelines where there is more wave action.

Black seaweed grows along protected shorelines where there is less wave action.

### **Set Purpose for Today's Lesson:**

Today we will learn the different parts of seaweed so that we can understand how to harvest seaweed respectfully.

## **Step 2**

### **Building Background Knowledge**

**45 minutes**

#### **Learning about Seaweed**

*If you are able to obtain enough fresh seaweed for students to observe, have them create scientific illustrations as follows and then proceed to Step 3. If you do not have seaweed samples skip this step and move directly to Step 3.*

Ask students to draw seaweed from memory. Tell them to try their best to add details but not to worry about the quality of their drawing.

When finished tell students they will now closely observe seaweed. Provide small groups with the seaweed samples. Allow adequate time for students to examine the specimen using magnifying tools and encourage discussions of observations within their groups.

Ask open-ended questions to guide observations. For example: *What do you notice about the shape, the color, the texture, the scent, the length, the width, and the weight of the specimen?*

When students have had enough time using the tools and discussing observations, provide each student with the drawing paper. Tell students to **silently** create a detailed scientific illustration of the seaweed specimen.

Discuss: ***What were you able to observe about seaweed?*** Allow students time to share what they observed. Volunteers may show their illustrations.

Ask: ***How does observation, help us to learn about seaweed?*** Ask students to retrieve their seaweed memory drawings and have them compare their scientific drawing to the “memory” drawing. Discuss the differences.

Ask students to observe the seaweed specimen again. Tell them people have identified 3 main parts of the seaweed and each part has a specific function, or job.

Encourage students to try to identify these 3 different parts and to guess the function. Do not tell them the answers. Instead, facilitate discussion among groups.

Ask: ***How does observation, help us to learn about seaweed?*** Ask students to retrieve their seaweed memory drawings and have them compare their scientific drawing to the “memory” drawing. Discuss the differences.



Ask students to observe the seaweed specimen again. Tell them people have identified 3 main parts of the seaweed and each part has a specific function, or job.

Encourage students to try to identify these 3 different parts and to guess the function. Do not tell them the answers. Instead, facilitate discussion among groups.

<b>Step 3</b>	<b>Building Background Knowledge</b>	<b>30 minutes</b>
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Pass out Student Page: *Learning about Seaweed*.  
Tell students they will read for information to answer the following:

***What are the 3 main parts of the seaweed?***

Depending on the abilities of your students, choose to conduct the reading to meet all student needs.

When finished reading, discuss the content. Then have students complete the Student Page: *Seaweed Structure and Function*.

Finally, if students were able to draw seaweed, have them label the parts of their scientific illustration using the structure words.

<b>Step 4</b>	<b>Closing &amp; Assessment</b>	<b>10 minutes</b>
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Discuss/Reinforce the function of the holdfast, stipe and blade.

Journal Response (Assessment):

- What is the function of the holdfast, the stipe and the blade?

Lesson 6 ***A Mindful Harvest***

<b>Purpose</b>	To apply understanding of seaweed structure and function to a mindful harvest.	
<b>Essential Question:</b>	<i>What is the value of seaweed to me/Tlingit culture?</i>	
<b>Alaska Standards:</b>	L5.6; RI 5.2; F.2; F.3. W5.4	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• Students read articles to learn how to harvest seaweed.</li> <li>• Students apply knowledge of seaweed structure and function to respectful harvesting techniques.</li> </ul>	<b>Assessments</b> Journal Response

**Duration:** 45 – 60 minutes

**Materials**

- Student Page: Dolly Garza Harvest
- Student Page: Dolly Garza Article
- <http://sitkawild.org/2014/08/living-with-the-land-seaweed-harvest/>

**Vocabulary**

- Mindful Harvest

**Procedure**

**Step 1                      Activating Prior Knowledge                      10 minutes**

Revisit Prior Learning:

Briefly review the structure and function of seaweed.

Set Purpose for Today’s Lesson:

Let students know they will learn how the structure and function of seaweed is used when harvesting.

**Step 2                      Building Background Knowledge                      45 minutes**

**Read for Information**

Pass out the student pages: ***Dolly Garza Article*** and ***Dolly Garza Harvest***.

Lead reading groups: You may choose to read aloud to the group and discuss as you go or have students read in small groups or independently depending on ability level.

Discuss and Summarize:

What is a Mindful *Harvest*?

How does understanding seaweed structure and function help you harvest seaweed?

### Step 3

### Building Background Knowledge

Day Field trip

#### Harvesting Field Trip

If you live in an area where red ribbon or black seaweed is harvested, lead a field trip to harvest seaweed (Juneau requires a permit to harvest seaweed. Be sure you have one ahead of time. See Background Information: Harvesting/Obtaining Seaweed in Juneau). Be sure to have elders or cultural specialists present to guide the process.

Prepare students in advance: they will need proper clothing and respectful behavior. Students will be given a Ziploc bag to fill up with seaweed. Teachers, chaperones and cultural specialists will monitor students to be sure they take care in selecting seaweed and that they have respectful manners for the earth/ecosystem while gathering. Let the students know they will be required to explain the ways they were mindful/respectful when they return to class.

When you return to class have a specialist or elder demonstrate how to clean the seaweed (with or without scissors). Show students the following:

- Holdfasts are removed and any critters within the seaweed will be removed and thrown in the garbage.
- Any other seaweed accidentally picked will also be thrown away.
- Seaweed is pulled and spread apart so that the seaweed clumps are opened and all of the seaweed can dry.

Then have students clean the seaweed with their hands or with scissors to cut off the barnacles and to remove any crawling critters on the seaweed. Have them open and spread out the seaweed on a large sheet in preparation for the drying process or keep the seaweed in slat water or frozen until you are able to begin the drying process.

#### Optional Activity (If you cannot harvest in your area)

Have students watch a video of the seaweed harvest process or look at still pictures of the process. Describe the process or have a cultural specialist describe the process. Then give students pictures out of order and have them arrange them in order and write a “how to harvest seaweed” paragraph using first, next, then, and finally (transition words).

<http://sitkawild.org/2014/08/living-with-the-land-seaweed-harvest/>

### Step 4

### Communicating Understanding

30 minutes

Independent Practice:

Have students write a paragraph describing the seaweed harvesting steps. Teach students to use appropriate transition words and reinforce elements of paragraph writing.

**Step 5** **Closing & Assessment** **10 minutes**

Journal Response (Assessment):

- Describe how to harvest seaweed mindfully/respectfully.

**Lesson 7** ***Drying Seaweed***

<b>Purpose</b>	To learn how to dry seaweed and why this preserves seaweed; To practice the value of sharing traditional foods with family members	
<b>Essential Question:</b>	<i>What is the value of seaweed to me/Tlingit culture?</i>	
<b>Alaska Standards:</b>	L5.6; RI 5.2; F.2; F.3; W5.4	
<b>Objectives</b>	<b>Assessments</b>	
<ul style="list-style-type: none"> <li>• Students will learn the process for drying seaweed.</li> <li>• Students will identify the importance of evaporation in drying seaweed.</li> <li>• Students will determine what happens when seaweed is not dried properly.</li> </ul>	Post-Assessment	

**Duration:** 45 - 60 minutes

**Materials**

- Outside location for drying seaweed
- Large sheet for drying seaweed
- Large rotating fan
- Garbage can
- Gram scale- or kitchen scale
- For Flavoring: Clam Juice, Sugar, Salt, Soy Sauce, Ginger, Garlic etc.
- Student Page: Celebration Contest Recipes Article
- Seaweed drying photos

**Vocabulary**

- condensation
- evaporation
- liquid
- vapor

## Procedure

### Step 1 Building Background Knowledge 20 minutes

Guided Reading: *Reading for Information*

- Pass out the Student Page: Celebration Contest Recipes.
- Have students highlight or underline sections that describe the drying process.
- Discuss and create a chart/list of the techniques.

Show Seaweed Drying Photos

Elder/Cultural Specialist Visit

- Have an elder or specialist discuss their personal experiences with harvesting and drying seaweed.

### Step 2 Building Background Knowledge 1-2 days

Activity: *Drying Seaweed*

Have an elder or specialist guide student through the drying process.

***Option if you cannot harvest seaweed:***

*You will need to obtain frozen seaweed from another community ahead of time. Thaw the seaweed ahead of time and guide students to clean and prepare it for drying as explained above in Lesson 6.*

*Then explain/discuss the importance of cleaning seaweed-preferably at the beach- and preparing for drying process. These steps ensure there will be no waste and this shows respect for food and the earth.*

### Step 4 Communicating Understanding 30 minutes

Paragraph: How to dry seaweed

Have students describe the process of drying seaweed. Emphasize transition words and paragraph writing elements.

### Step 5 Family Sharing

Host a family potluck event for students to share the seaweed.

### Step 6 Post Assessment



Have students take the Post Assessment.