

'Ewa 'Āina Education Initiative

Unit Plan: What stories do *limu* tell? A mini unit of 'Ewa limu

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'Ewa 'Āina Site: 'Ewa Limu Project

Hawaiian Culture-Based Lens	Cross Cutting Content	Instructional Design
<ul style="list-style-type: none"> Mālama `Āina: Land stewardship focusing on sustainability and a familiar connection Kōkua Kaiāulu: Community giveback embodying a core Hawaiian value 	<ul style="list-style-type: none"> Geography - representation of 'Ewa moku (a piece or whole) coastline Reading - informative text Writing - informative writing & perspective writing Advocacy - presenting perspective 	<ul style="list-style-type: none"> Scientific Inquiry - What stories do <i>limu</i> tell? Stewardship - Sustainability - Mālama 'Āina/Mālama i ke Kai Oral Presentation

Essential Question/s (3 max) that unit will address

For help and information on the creation of essential questions directly from Jay McTighe and Grant Wiggins click on the following URL

<https://cutt.ly/cfRqzXy>

1. What stories do *limu* tell?
2. How do the structures of various *limu* help them to survive?
3. How do we decide if *limu* is worth fighting for?

Unit Plan Descriptive Title: What stories do *limu* tell? A mini unit of 'Ewa limu

Target grade/s: 4

Target subject/s: Science

Background Information:

The following lessons are part of a bigger unit about *ahupua'a* (land divisions) and its resources. The lessons focus on *limu*, or marine algae, from the *kai* (ocean) area of the *ahupua'a*, specifically, 'Ewa moku. Through *mo'olelo* (stories), students learn about the uniqueness of Hawai'i's *limu*, Hawaiian culture, and Hawai'i as their home.

Limu is an essential part of the marine ecosystem, providing food and shelter for other organisms. It is the fundamental piece of healthy food chains. *Limu*'s role is to absorb energy from *ka lā*, (the sun/Kāne), carbon dioxide, and water to produce food. Without native *limu*, the population of native plants and animals decline.

The 'Ewa coastline from Pu'uloa, to One'ula, and to Ka'uluokaha'i/Kūalaka'i were once abundant with native *limu*. *Limu* was included in every meal as a condiment or side dish to fish and *poi* (pounded taro root with water). It provides beneficial nutrients and vitamins in order to survive and grow healthy and strong. Native Hawaiians used *limu* for food, medicine, and even to make *lei*, or flower necklaces. According to the late Dr. Isabella Abbott, Native Hawaiian ethnobotanist and phycologist, "all *limu* are edible depending on one's preference of taste and texture." *Limu kohu*, a reddish brown stained *limu*, is a favorite among many

Hawaiians. Limu as food requires patience and attention to detail to properly harvest and clean in order to eat with others. Auntie Vivian Ainoa, respected elder from Moloka'i, keeps Hawaiian limu traditions and culture alive by sharing her *'ike* (knowledge) of how to harvest and clean limu.

Limu not only provides the basic nutrients needed for a healthy diet, but also medicine for spiritual, emotional, and social health. For example, *limu kala*, known as the "forgiveness limu," was used during a type of conflict resolution ceremony called, "*ho'oponopono*." One way to *kala* (forgive) was to exchange lei limu kala, share, eat, and then release into the ocean as a cleansing or purifying process. This signified all of the *pilikia*, or problems, to be washed away and the relationship to be rebuilt with better intentions. Limu kala is arguably the most significant type of limu in Hawaiian culture.

The health of the trees up *mauka* (toward the uplands) connect with the health of limu at the coastline, supporting the connection between the mountains and the sea. The development and gentrification of the 'Ewa moku has directly impacted the flow of fresh water to our aquifers and underground springs, directly affecting the growth and abundance of limu. Native limu once found all over in heaps have greatly declined due to pollution, the introduction of alien species, and the diversion of fresh water for agriculture use and development of roadways. Once water stopped flowing, limu stopped growing.

Limu traditions and stories are few and far between. Fortunately, groups such as 'Ewa Limu Hui, are working to restore and perpetuate Hawaiian culture through educating people about the importance of limu. The late Uncle Henry Chang Wo was an inspiration to many to continue to fight for native limu and Hawaiian traditions. Uncle Henry was able to read the health of the reef and limu on the 'Ewa coastline and know the story of the trees in the *uka* (uplands). This wisdom of *kilo* (observation) and understanding of interdependence within systems of life is an example of what students need to be exposed to in order for them to further understand the uniqueness and sophistication of the Hawaiian culture.

From this unit, students will be presented with information from kupuna, texts, and video in order to understand the essential role of limu in the marine ecosystem and in Hawaiian culture. Students will determine if limu is worth fighting for in order to restore balance and health to the land, seas, and people of Hawai'i. Students will call people to action to *mālama 'āina* (care for the land), *mālama i ke kai* (care for the ocean), *mālama ka honua* (care for the earth) in a final project of advocacy.

Detailed 'Āina Site Information available at the following URL:

https://drive.google.com/file/d/1XUgEz8iLZxs8M8gfraV_Ae5TBYYDpeh3/view?usp=sharing

A direct link to Halau o Pu'uloa: Ewa 'Āina Inventory is available via the following URL:

https://www.ksbe.edu/assets/site/special_section/regions/ewa/Halau_o_Puuloa_Honouliuli.pdf

[Cultural Historic Overview of 'Ewa \(https://cutt.ly/ZHglTQ1\)](https://cutt.ly/ZHglTQ1)

['Ewa 'Āina Inventory: Halau o Pu'uloa \(The Many Breaths of Pu'uloa\) Ahupua'a Chapter - Honouliuli \(https://cutt.ly/0HglPcwv\)](https://cutt.ly/0HglPcwv)

- Honouliuli background information - .pdf pg. 1-5 (document pg. 237-241)
- Honouliuli Map - .pdf pg. 6 (document pg. 242)
- 'Ewa Limu Project information - .pdf pg. 34-35 (document pg. 270-271)

[Field Guide to Hawai'i's Coastal Organisms: Algae & Invertebrates \(https://cutt.ly/MHglNsF\)](https://cutt.ly/MHglNsF)

- Red, Green, and Brown algae cards can be printed, cut, and laminated to create identification flashcards
- Extra information on invertebrates to connect to "What is a kāheka?" text

[Marine Algae of Hawai'i](https://cutt.ly/WHgl8BR) (<https://cutt.ly/WHgl8BR>) resource information about native and invasive limu of Hawai'i.

- [Invasive Marine Algae of Hawai'i](https://cutt.ly/6HgzdS) (<https://cutt.ly/6HgzdS>)
- [Edible Limu of Hawaii, University of Hawai'i Botany Department, 2002](https://cutt.ly/aHgztQ) (<https://cutt.ly/aHgztQ>)

[Basic Structures & Functions of Limu](https://cutt.ly/9JcSP3o) (link: <https://cutt.ly/9JcSP3o>)

['Oli E Hō Mai and 'Oli Mahalo](https://cutt.ly/OHgziDi) (<https://cutt.ly/OHgziDi>)

[Nā Hopena A'o Framework Cards](https://cutt.ly/vHgZOUL) (<https://cutt.ly/vHgZOUL>)

- These cards can be printed for yourself or to display or distribute to students

Sequential Unit Plan Lesson Outline

Lesson Title	Time Estimate in Hours
Hawaiian Economics - Land Divisions <ul style="list-style-type: none"> • Students will learn about land divisions - <i>moku</i>, <i>ahupua'a</i>, <i>'ili</i> • Students will learn the difference between natural, human, and capital resources 	45 - 50 min.
Hawaiian Economics - Within an <i>Ahupua'a</i> <ul style="list-style-type: none"> • Students will learn about the different resources available within an <i>ahupua'a</i> (resources within the <i>uka</i>, <i>kula</i>, and <i>kai</i> - emphasis on <i>kai</i> to connect to <i>limu</i> coastal ecosystem) 	45 - 50 min.
'Ewa Limu <ul style="list-style-type: none"> • Students will learn about where they live ('Ewa moku, <i>ahupua'a</i> Honouliuli, 'ili Pu'uloa) through an overview of the history of 'Ewa moku (Google Earth 'Ewa <i>limu</i> huaka'i) • Students will be introduced to limu (seaweed) and its role in the ecosystem 	2 - 3 work period blocks of 60-90 minutes
<i>Limu</i> Stories <ul style="list-style-type: none"> • Students will watch videos from Limu Hui, the organization that is helping to restore the abundance of limu and significance of Hawaiian culture. • Students will ask and answer thought provoking questions that will lead to inquiry for the huaka'i, field trip, and final project. 	1 work period block 45 - 50 min.
Huaka'i i ke One'ula with Uncle Wally Ito <ul style="list-style-type: none"> • Site visit to One'ula beach park with Wally Ito. • Students will learn the names and mo'olelo of limu found on the coastline of One'ula by collecting and sorting samples. 	3 hours

<ul style="list-style-type: none"> • They will make observations and inferences about the health of the limu and its surrounding environment. 	
<p>Advocation Project; How do we mālama limu?</p> <ul style="list-style-type: none"> • Students will create a poster board or digital presentation, with geographical representation, about ‘Ewa limu, its importance to the ecosystem, and how/why we need to mālama i ke kai. 	<p>6-10 hours (example: 2 hr learning block each day for brainstorming/planning, drafting, final)</p>

Unit Assessment Plan

Formative Assessment Methods Used On a Regular Basis Throughout Unit

1. Teacher observations of student participation in discussions.
2. [Jamboard](https://cutt.ly/mHgczuzP) (<https://cutt.ly/mHgczuzP>)/Chart paper (“parking lot” of ideas) of “What is limu?” thoughts and new understandings to be used throughout the unit. This will be visited at the beginning and end of each lesson.
3. [DLIQ](https://cutt.ly/5HgcmrK) (<https://cutt.ly/5HgcmrK>) written reflection after each lesson: What did you do? What did you learn? What did you find interesting? What questions do you still have?

Summative Assessments

1. ["What is limu?" Pre assessment](https://cutt.ly/4HgcBVv) (<https://cutt.ly/4HgcBVv>) as a Google Form
2. ["What is limu?" Post assessment](https://cutt.ly/vHgvdAr) (<https://cutt.ly/vHgvdAr>) as a Google Form
3. Construct a graphical representation of Honouliuli coastline to show where to find limu, how it grows, environmental features, etc. (via art project or possibly Google Earth huaka'i that is student created). Students will present their project and advocate for the importance of the role of *limu* in our ecosystem and how the community can *mālama 'āina*.