Curriculum Unit for Native Plants Associated with Hula

‘Ohi’a Lehua *Metrosideros polymorpha*
‘Ie’ie *Freycinetia arborea*
Halapepe *Pleomele hawaiensis*
Maile *Alyxia oliviformis*
Lama *Diospyros sandwicensis*

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Contents:

Introduction Lesson
- Arrival and evolution of species
- Hawaiians as Scientists
- Conservation
- Discussion of 5 plants and lessons pertaining to each plant and Kuahu Hula

Characteristics Lesson
- Scientific classification of Plants
- Description plants from observing photos
- Introduce unfamiliar terms
- Introduce characteristics for each plant
- Measuring ht./diam. of plant and mapping data
- Quiz

Traditional Uses Lesson
- Hawaiian utilization of native plants upon arrival
- Discuss tools they would have needed
- Observe photos of plants (what were its uses)
- Introduce Hawaiian terms
- Introduce uses for each plant
- Creating replica of item/ drawing/painting
- Quiz
Medicinal Uses Lesson
• Hawaiian experimenting
• Discussion of familiar medicines made from plants
• Introduce Hawaiian terms/ other plants used
• Introduce medicinal uses for each plant
• Demonstration of making medicine
• Quiz

‘Olelo No’eau/ Kinolau/ Hula Lesson
• Discuss representations of plants
• Describe ‘olelo no’eau and use in Hawaiian language
• Describe Kaona and use in language
• Introduce ‘olelo no’eau for certain plants
• Introduce Kinolau
• Describe Hula/ Kuahu Hula
• Introduce representation of each plant
• Compose an ‘olelo no’eau activity
• Quiz

Mo’olelo Lesson
• Describe mo’olelo and Ka’ao
• Introduce mo’olelo for certain plants
• Dramatization of mo’olelo
• Quiz

Conclusion Lesson
• Final Project
Characteristics Lesson

Notes

- Scientists classify plants and group them into different categories by their main characteristics such as leaf and flower shape size and color
- Certain characteristics may be distinct to the plant order, family, or genus
- Each plant is given a genus and species for the genera it falls under, and the particular species in the genera
- Species are the same if they are able to interbreed
- Isolation over time causes a certain species to separate, becoming 2 different species
- Scientific names are Latin

Activity #1

- Look at the photos of each plant. Write down a brief description of each plant
- Questions to think about: Is it a tree/shrub? What size/shape/color are the leaves? Flowers?

Items for Activity: Photos of each plant

Hawaiian/Unfamiliar Terms

Ka Lau: leaf
Ka Pua: flower
Ka Lala: branch
Ke Kumu: trunk/tree
Ka ‘Ili: bark
Ka Ma’alewa: aerial root

Monoecious: A plant, which has both reproductive organs on the same plant
Dioecious: A plant, which has reproductive organs on separate plants
Host plant: A plant dependent on another for survival
Endemic: A species confined to a particular place, evolving there, and found nowhere else.
Native/Indigenous: A species belonging to a particular place (more than one) naturally
Introduced/Alien: A species not belonging/evolving in a particular place.
Endangered: A species with a small population, in threat of becoming extinct.
Invasive: A species (usually introduced) not common in a particular place, taking over,
and threatening the survival of certain species.

**Characteristics for ‘Ohi’a Lehua Metrosideros polymorpha**

**Family:** MYRTACEAE, Myrtle Family

**Description:**
- Endemic tree or shrub
- Reaching to 100 ft. tall
- Wood is hard, heavy, close-grained and varies in color from a light red to a purplish blue.
- The leaves are shiny or dull green, oval-rounded.
- Tassel-like blossoms vary from the common, bright-red through salmon-pink orange or yellow and pale yellow in color.
- Tiny seeds.
- Pioneer plant- one of the first to establish on new flows.
- Shrublands, mesic to wet forests, from sea level- 2200 meters.

**Characteristics for ‘Ie’ie Freycinetia arborea**

**Family:** PANDANACEAE, Pandanus Family

**Description:**
- Woody climber, ascending trees/ rocks/ ground crawler.
- Indigenous.
- Twines like a vine, climbs up to 100 ft.
- Spiky linear yellowish green leaves up to 80cm long.
- Stems up to 1” thick.
- Host plant- Usually climbs ‘Ohi’a Lehua.
- Salmon orange/ pink/ green flowers.
- Red berries.
- Mesic- wet forests on ridges/ slopes 300-1500m.
- Other species found in South pacific (Marquesas, Tahiti).
- Pollinated by Japanese White eye birds, past by endemic Drepanids.

**Characteristics for Halapepe Pleomele hawaiiensis**

**Family:** PANDANACEAE, Pandanus Family
Description:
- Tree reaching 5-6 meters tall
- Spiky linear yellowish green leaves up to 40cm long
- Resembles money tree- same genera
- Yellowish colored flowers
- Red berries up to 13mm long
- A rare endemic and endangered species
- Found in dry forest from 300-860m

Characteristics for Maile *Alyxia oliviformis*
Family: APOCYNACEAE

Description:
- Endemic twining vine/ shrub
- Upper leaf- glossy, lower- pale green, oval shaped, and sometimes oppositely arranged
- Greenish- yellowish white flowers
- Common in most vegetation types, dry/wet sea level- 2000 meters
- Morphological in habitat- leaf shape/ size and texture vary
- Hawaiians recognized four types
- Maile Kaluhea- Fragrant Maile
- Maile Lau li’I- Small leaved Maile
- Maile Ha’I Wale- Brittle leaved Maile
- Maile Pakaha- Large leaved Maile
- Contains the chemical- Coumarin responsible for fragrance when crushed

Characteristics for Lama *Diospyros sandwicensis*
Family: EBENACEAE

Description:
- Dioecious endemic tree
- Grows to 40 feet tall
- Dark black/ gray wood color
- Pale green waxy leaves, oval shaped
- Reddish new leaf growth
- Whitish green flowers
- Egg shaped fruits/ persimmons are edible, yellowish orange- red orange
- Dry- mesic forests/ wet 5-1220meters
- Varieties in Africa, Asia, Pacific

Activity #2
- Divide into groups- each responsible for measuring height/ diameter at breast height for 1 plant of same species
• Record the leaf color/ shape
• Are there flowers present?
• Scientists would graph data to know the general characteristics of a certain species in a particular habitat
• Each group graphs height and diameter- What can you tell about the species in this habitat?
• Are leaf sizes/ colors the same?

Items for Activity: Measuring tape, height pole, graphing sheets, poster board for graphs
Traditional Uses Lesson

Notes

- When Hawaiians arrived in Hawaii, they brought crops, but most of the plants were already here
- They utilized the forest for survival necessities
- How would the forest be useful if you had just landed on a deserted island?
- Hawaiians also experimented with different plants to figure out which were the best for making tools, cordage, clothing, canoes, etc.
- A lot of trial and error occurred before they knew which plants were important for which necessity
- The importance of such plants for survival necessities led Hawaiians to value the plants, and hold them sacred

Activity #1

- Look at the photos of each plant
- What kinds of purposes did the plants serve? What could have been made from it?

Items for Activity: Photos of each plant

Hawaiian/ Unfamiliar Terms

Ka Hana: work, labor, duty, task
  - Hawaiians had designated duties that enabled their ‘ohana to survive
  - What kinds of professions do you think Hawaiians had?
Ka Mea hana/ Mea ho’ohana: Tool

Traditional uses for ‘Ohi’a Lehua

- House posts
- Spears
- Poi boards
- Kapa anvils
- Kapa beaters
- Canoe gunwales, rafters, seats
- Ki’I: sacred images- reddish wood for sacrifice
- Fire wood
- Hale for heiau: houses for sacred temples
• Loose roofing- foliage
• Tool handles
• Leis- Liko/ leaf buds
• Flowers contain nectar for birds

Items needed: photos of uses

**Traditional uses for ‘Ie’ie**

• Ke Kaula/ Aho: Cordage made with ‘Uki’uki. Split vertically in half after placed in imu and braided with ‘Uki’uki leaves
• For tying house posts, weaving hina’I: baskets/ fish traps, foundations for ali’I Mahiole: feathered helmet
• Sandals
• Roof thatching

Items needed: photos of uses/ ‘Uki’uki plant

**Traditional uses for Halapepe**

• Leis- Kona people were recognized by their frequent wearing of the Halapepe flower lei
• Carving images- soft white wood

Items needed: photos of uses

**Traditional uses for Maile**

• Fragrance for scenting kapa
• Leis
• Fruits are eaten by Hawaiian birds
• Hina’I- fish traps

Items needed: photos of uses

**Traditional uses for Lama**

• Fish traps- wood
• Heiau timber
• House posts
• Fencing for sacred areas (ali’I houses)
• Tide gates
• Fruit eaten by Hawaiian birds
• Leis- liko

Items needed: photos of uses
Activity #2

- Create a replica of a tool/other thing that was made from one of the plants
- Or draw/paint tool/Tool being used in its proper environment

Items needed: construction paper, white paper, coloring materials

Quiz
Inoa:

Plant Characteristics Quiz

1. What is a pioneer plant? Why is the ‘Ohi’a Lehua a pioneer plant?

2. Name two types of Maile

3. What type of habitat does the Halapepe belong to?

4. Describe the wood and fruit of the Lama tree.

5. What color are the ‘Ie’ie flowers? Why is it a host plant?
6. Which of the 5 plants we learned about are endangered? What does endangered mean?

7. What is the name of the chemical that makes the Maile fragrant?

8. Write the Hawaiian terms for each part of the plant.
Inoa:

Traditional Uses Quiz

1. What does hana mean?

2. Name three things the ‘Ohi’a lehua was used for.

3. Name two things the ‘Ie’ie was used for.

4. People from which area were known for wearing Halapepe leis?

5. What did Hawaiians use Maile to scent?
6. Name two things the Lama was used for.

Extra Credit

7. How did Hawaiians make cordage with the ‘Ie’ie?
Medicinal Uses Lesson

Notes

- Just like Hawaiians had to experiment with the plants to find which were useful, they experimented/ trial- and error with plants to make medicines
- They may have tested their medicines on dogs/ people/ other animals
- They also may have observed the behaviors of animals while they were sick/ watched what they ate
- Besides illnesses, it was believed some plants were powerful enough medicines to cure/ rid curses from sorcery
- Discussion- What types of plants are you familiar with for helping cure/ remove symptoms
- Ex: tileaf and fever

Hawaiian/ Unfamiliar Terms

Ka La‘au Lapa‘au: medicine
Ke Kahuna: priest
- Many types of Kahuna – 1 specialized in knowing different plants for medicines/ prayers for treating/ proper doses to give
Ka pule: prayer

Medicinal Uses for ‘Ohi’a Lehua

- Child birth- Kanikawi (name for ‘Ohi’a flower) made into a liquid with hau slime from inner bark to drink when pains were intense
- Ointment for sores- made from bark
- Muhe’e- (discoloration) redness or paleness of babies- Liko and Lama Liko are sun dried, boiled, and mixed with poi, and eaten with limu lipoa/ kukui ‘inamona
- ‘Ea (thrush)- two handfuls liko (leaf buds) and two hand fulls lama leaves and liko and pound, then mix with water and leave overnight. Add 4 hot stones the next day and drink when cooled and eat with lehua type poi.
- Lama bark was made into a paste and placed on sores

Medicinal Uses for ‘Ie’ie

- Pa’ao’ao (weakening disease)
- ‘Ea (thrush/ whitening of mouth)
- Remove whitening on tongue
- Piwa (fever)
- Ho’omoemoe (induce sleep) if constant chest pains/ burning of chest

Piwa- leaves of ‘ie’ie placed on bed as a mat for patient to sleep on
Medicinal Uses for Halapepe

- Hu‘I (aches/ pains/ toothache)
- Li’a (fear/ chills)
- Piwa
- Ni‘au (lung trouble with asthma)
- Po‘ipu (under influence of obscure kahuna)

Hu‘I/ Li’a/ Piwa- 20 leaves, 4 pieces halapepe bark mashed with 4 ‘uhaloa root bark and 4 popolo root bark, and ko. 2 niu cups of water added with 2-4 heated stones. Medicine is cooled and drunk from an ‘opihī shell 4 times a day.

Or bark and young leaves are boiled and made into a drink

Medicinal Uses for Maile (Kaluhea)

- Puho/ Puha (sores on skin) Ripe fruits are made into a soup or stew until dark green color and sores are washed with the medicine
- Preventing Lele (contagious diseases)- patient lays in a bath with the above mixture

Medicinal Uses for Lama

- Muhe’e- (discoloration) redness or paleness of babies- Liko and Lama Liko are sun dried, boiled, and mixed with poi, and eaten with limu lipoa/ kukui ‘inamona
- ‘Ea (thrush)- two handfuls liko (leaf buds) and two hand fulls lama leaves and liko and pound, then mix with water and leave overnight. Add 4 hot stones the next day and drink when cooled and eat with lehua type poi.
- Lama bark was made into a paste and placed on sores

Activity #1

- Demonstrate and have students make a medicine.
- Students may not be able to work with plant materials. In place a dye could be made to have students partake in a hands on activity

Items needed: (for dye) ‘olenā, fabric/ paper bags, kapa stamps, hala seed paint brush, bowls, cheese cloth, aprons

Quiz
Inoa:

Medicinal Quiz

1. What is the Hawaiian term for Medicine? Which people were skilled in treating illnesses?

2. How was the 'Ie'ie used to reduce a fever?

3. What type of Maile was used for Puho (sores)? What part of the plant was used?

4. Which plant was used to cure a curse of obscure Kahuna?

5. What was the medicine made from both the lama and 'ohi'a used for?
Extra Credit

6. Describe how this medicine was made.
‘Olelo No’eau, Kinolau and Hula Lesson

Notes

• Another way in which plants were sacred and important to Hawaiians was through their representations of certain akua or gods, and also through their representation of certain characteristics or traits

Hawaiian/ Unfamiliar Terms

‘Olelo no’eau: Traditional, wise, or old saying describing an event, place, person, god, ali’I etc.

Kaona: Hidden meaning, concealed reference for a person, place, thing; Also words with double meanings, which may bring good or bad fortune

Kinolau: different forms taken by akua, ‘aumakua (ancestral spirits)
Hula: dance expressing mo’olelo, event, praising an ali’I
Kuahu: Altar, adorned with plants representing different akua, to assist hula students in their learning

‘Olelo No’eau for ‘Ohio’a Lehua

• He Kumu Lehua Muimuia I ka Manu
  A Lehua Tree Covered with Birds
  An Attractive Person. A Lehua tree in bloom attracts birds, like an attractive person draws the attention of others.

• Pua ka Lehua
  The Lehua is in Bloom
  The people of Kawaihae would say this phrase to refer to a school of aku of aku appearing, since it was bad luck to speak of the fish as well as going fishing.

• Pua mai ho’I ka Lehua
  The Lehua is in Blossoming
  The faces are red from drinking beer.

‘Olelo No’eau for Maile

• Ka Makani Hali ‘Ala o Puna
  The Fragrance Bearing Wind of Puna
  Puna was famed for the fragrance of Maile, Lehua, and Hala. It was said fisherman at sea could smell these fragrances wind the wind blew from the land.
Ke Kuahu Hula

Notes
• In an ancient account, 2 gods referred to as Laka arrived from Tahiti and danced for the people of Hawai‘i. The male Laka disappeared and left the female Laka to dance alone.
• The Kuahu hula was an altar composed of a variety of plants, that were sacred to Laka, and also those which represented her, as well as other gods associated with hula, or characteristics that would be useful for the dancers’ learning.

Items needed: Picture of Kuahu Hula

Kinolau for ‘Ohi’a Lehua
• Ku- god of war: associated with being upright
• Kuka’ohi’akalaka- god transformed into a ‘Ohi’a tree
• Wood- represents male Laka; Flower- represents female Laka
• A piece of ‘ohi’a wood, liko, and flowers adorned the altar

Kinolau for ‘Ie’ie
• Lauka’ie’ie- goddess raised by ‘Ohi’a and ‘Ie’ie plants
• Laka- one of her plant forms
• A branch of ‘ie’ie was placed upon the altar to represent these 2 gods

Kinolau for Halapepe
• Kapo’ulakina’u- sister of Pele, dual nature- hula goddess/ sorcerer
• A branch of Halapepe was placed upon the altar for this hula goddess

Kinolau for Maile
• Maile sister’s plant forms
• The altar was decorated with 4 types of maile for each sister

Lama
• A block of lama wood, wrapped in yellow kapa was also placed on the altar to represent Laka, and since Lama is translated as enlightenment, it was thought to enlighten the dancers.

Activity #1

Create an ‘Olelo No’eau by comparing the ‘Ie’ie, Halapepe, Lama, Lehua, or Maile to something you feel appropriately describes it.

Example: A Lehua Blossom is blowing in the Wind
A beautiful dancer is dancing hula

Items needed: construction paper, white paper, line paper, coloring materials

Quiz
Inoa:

‘Olelo No’eau, Kinolau, and Hula Quiz

1. What does Kaona mean?

2. What is the hidden meaning for the ‘olelo no’eau, Pua Ka Lehua
   (The Lehua is in bloom)?

3. Which gods brought the art of hula from Tahiti? (hint: they have the same name)

4. Whose Kinolau was the ‘Ohi’a Lehua?

5. How was the Lama placed upon the Kuahu Hula? What did it symbolize for the dancers?
Extra Credit

6. Which goddess had a Halapepe Kinolau? What was she a goddess of? (name two things)
Mo’olelo Lesson

Notes
- Hawaiians were famed story tellers, that told of places, persons, and events.
- Many stories were told that have references to native plants

Hawaiian/ Unfamiliar Terms

Ka Mo’olelo: Story, tale, myth, history, tradition, literature, legend.
Ke Ka’ao: Legend, tale, novel, romance, usually fanciful; fiction; tell a fanciful tale.
Ka Ha’awina: Lesson or moral learned from a mo’olelo

Mo’olelo for ‘Ohi’a Lehua

- Kūka‘ōhi’aakalaka: Kū, the ‘ōhi’a of the forest
- Kohaikalani: The evil chief of Ka‘ū

Activity #1

- Read two mo’olelo in class
  Items needed: copies of both mo’olelo

Activity #2

- Dramatization of two mo’olelo
  Items needed: props?

Quiz
Mo’olelo Quiz

Kuka’ohi’aakaLaka
1. How did Kū‘ohi‘aakalaka and his family get vegetables?

2. What did Kauakahine change into?

3. What happened after Kū‘ohi‘aakalaka learned about the tragedy that fell upon his sister’s family?

4. Describe the ‘Ohi’a Lehua tree that Kuka’ohi’aakaLaka changed into.
Kohaikalani

1. What did Kohaikalani require of his men to bring to the heiau from Kawa beach?

2. After the chief Kohāikalani chose his tree, what did his men choose to do?

3. How was chief Kohaikalani killed?

Extra Credit

4. Describe the ha’awina or moral of one mo’olelo.
Conclusion Lesson

Notes

• In order for our communities to learn about the importance of conserving our native forests, they must be educated about our unique plant species, where they stand, and how they were used culturally

Activity #1

• Choose a native plant that was not discussed in class.
• Research its characteristics, cultural uses, and other importances
• Draw a picture of the plant, and write a summary of your research

Items needed: poster board, construction paper, line paper, white paper, coloring materials

Activity #2

• Write a short passage on why conservation is important to your community and yourself

Items needed: line paper