

'Ewa 'Āina Education Initiative

Unit Plan: Plants, Place and Pono
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'Ewa 'Āina Site: Pu`u o Kapolei

Unit Plan: Plants, Place and Pono, link to unit plan available via the following URL:
<https://cutt.ly/GKlqyfQ>

Detailed Lesson-Project Plan #2

Target grade: 9th-12th grade

Target subject: Plant Systems and 'Ōlelo Hawai'i

Lesson Title: How Can Students Restore a Place in a Pono Manner? Plants, Pono and Planning

Essential Unit Questions Addressed:

What are pono restoration activities that students can do for Pu`uokapolei?

Educational Standards

Next Generation Science Standards:

Standard 1 – NLP 1.0 Analyze non-food plant systems (PS) and their interactions to balance production and sustainability.

NLP 1.1 Evaluate characteristics of organisms as non-food (products or materials) commodities to maximize PS production within the boundaries of sustainability.

NLP 1.2 Assess features of environments to support PS (non-food products or materials) commodity production and environmental sustainability.

Standard 4 – NLP 4.0 Safety, legal and ethical considerations in PS Production

Adhere to regulatory guidelines to maintain safety and health in work environments.

NLP 4.1 Assess conditions with considerations for safety and health in PS production to mitigate risks.

- Perform site assessments in order to maintain a safe and healthy environment.
- Use materials, tools, technology and equipment in accordance with safety and health guidelines. Follow labeling, operating instructions, and precautions
- Comply with work safety, and health guidelines in the processing of PS products and disposal of wastes to eliminate or minimize impacts and consequences to humans and the environment.
- Employ injury prevention practices to ensure safety in PS work environments. Some examples are: Use of personal protective equipment (PPE), demonstrate proper body mechanics, and attend to appropriate dress and grooming such as tying up hair, removal of jewelry, coveralls or clothing coverage, etc.

HĀ framework and/or Hawaiian Culture integrated into this lesson

This lesson connects to the following:

- Belonging - Students understand place name and environment.
- Responsibility - Students learn the responsibilities of being stewards of the 'āina.
- Sense of Hawai'i - Students learn place names, people and plants of Hawai'i.

Materials needed

Note: consider contacting the Mālama Learning Center (MLC) via email at info@malamalearningcenter.org as their staff specializes in native plant education. The MLC may be able to provide materials and expertise for propagating and outplanting plants suitable for use at Pu`uokapolei.

Materials needed, cont.

- Seeds or cuttings of species that are chosen for Pu`uokapolei - and the following have been planted as part of the restoration so they may be a good place to start: ti, hala, `uki`uki, pōpolo, pohinahina, hala pepe, kou (tree), `ie`ie, and kalo suitable for dryland planting.
- Pots (or upcycled containers with drainage)
- Potting soil mix with perlite or rocks to allow for good drainage
- Trowels
- Gloves

Pedagogy (methods) Used

Video introduction and plant propagation activity

Lesson Introduction: Students will watch the Mālama Learning Center's video entitled: "Ola na Kini: Planting to Heal and Restore `Āina with the MLC" available via the following URL:

<https://vimeo.com/427638604>.

- Encourage student note-taking and let them know that they will be asked to paraphrase instructions before beginning the plant propagation activities

Instructional Sequence

Teacher Does	Students Do
Check for understanding of the plant propagation techniques described in the lesson introductory video - recommend that plant propagation supplies are set up and ready to use to assist with the review.	Students describe and/or demonstrate key plant propagation techniques as prompted by the teacher
Guide students through the propagation of chosen species for the purpose of outplanting at Pu`uokapolei.	Students work collaboratively to propagate as many plants as possible with available seeds/cuttings and potting supplies.
Review the care for the propagated plants and if necessary, move them to another location for optimal sun, water and minimal pest impacts. <ul style="list-style-type: none">• Plan on a minimum of 4 weeks before planning the huaka`i to Pu`uokapolei• Note that some species will survive better when outplanted if they go through a period of decreased water and increased time in the sun to acclimate to the arid conditions of Pu`uokapolei.	Students implement the native plant care plan. It is recommended that students complete plant care tasks on a regular, daily schedule based on assigned kuleana.

Closure - ask students to relate the activities of this lesson to 2 aspects of the HĀ framework (Belonging, Responsibility, Excellence, Aloha, Total Well-being and Sense of Hawai`i) and explain the connection...students to respond to this prompt via discussions with a chosen peer partner while the teacher circulates and listens to discussions.

Formative assessment:

Implementation of plant care plan as observed by the teacher. Recommend whole class review of progress on at least a weekly basis. Also assess plant growth and health with students on at least a weekly basis - adjust the plant care plan as merited.

Summative assessment: Students to develop the final products in collaborative groups:

1. Species specific plant propagation flyers and/or videos that include culturally significant information
 - Example video for `ākulikuli available via the following URL: <https://cutt.ly/QHgmHUO>
 - Example flyer for `ahu`awa available at the following URL: <https://cutt.ly/OHgm3zG>
2. A scripted activity plan for leading at least one plant propagation or outplanting activity on site at Pu`uokapolei - suggested topics include:
 - Sharing mo`olelo and mana`o associated with specific plants and Kapolei/Honouliuli in a fun, interactive way
 - Collecting seeds or cuttings appropriately without causing damage to plants
 - Outplanting native plants using techniques for the best chance of survival
 - Demonstrating a cultural use for a plant species present at Pu`uokapolei (without overharvesting - i.e. some of the materials will have to be brought to the site) simple lauhala weaving, dye making
 - Examples of similar activities field tested with high school leaders available via Hui o Ho`ohonua's Mālama Pu`uloa Program website Education page at the following URL: <https://www.malamapuuloa.org/education.html>
3. Let students know that the scripted activities will be demonstrated for peer review and implemented by them with guests at Pu`uokapolei during the upcoming huaka`i.

Accommodations for at least 3 types of diverse learners

- Collaborative groups will allow for peer assistance
- Allow access to voice-print software with spelling and grammar assistance for students who need help with formal written documents
- Teacher to provide frequent checks for understanding and additional coaching as needed.

Explain How This Lesson Relates To the Unit Summative Assessment

Summative assessment: Students will successfully lead plant related activities with guests on a huaka`i to Pu`uokapolei.