HOʻOKAHUA

Grade(s): 9-12, Post-Secondary

Subject(s): Agriculture, Botany, Sustainability, Hawaiian Studies

Topic: Setting the Foundation

Haʻawina 1

Lesson Focus and Goals:

- Students embark on a huakaʻi makahiʻo (field trip) to Hui Aloha ʻĀina Momona
  - Students participate in various on-site activities including:
    - Making a papa kuʻi ʻai (poi-pounding board)
    - Weeding, mulching, and maintenance

Materials Needed:

- All materials for the papa kuʻi ʻai will be provided by the host
- Clothes and shoes that can get dirty
- Refillable water bottles
- Hat, sunscreen, sun protection

Learning Objectives:

- Ma ka hana ka ʻike (In working one learns)
- Nānā ka maka; hana ka lima (observe with the eyes; work with the hands - *just watching is not enough, pitch in and help!*)

Structure / Activity:

- Opening Circle and E Ho Mai
- Half of the students make Papa Kuʻi ʻAi w/ Vince Resurrection
- Half of the students participate in various maintenance activities (weeding, composting, feeding farm animals, watering plants, etc.) w/ Daniel Anthony
- Closing Circle and Oli Mahalo

Lesson Reflections / Assessment:

- For those who made papa kuʻi ʻai, what did you learn from the process?
  - Did you make any mistakes? If so, what will you do differently next time?
- For those who participated in farm activities, was the hana (work) hard?
  - Would you want to work on a farm or own a farm?
  - Can you do this work on your own or with many hands pitching in?
  - Do you have a deeper appreciation for how we get food?
- What are some general takeaways from this experience?

MOʻOLELO AND MAKAWALU

Grade(s): 9-12, Post-Secondary

Subject(s): Agriculture, Botany, Sustainability, Hawaiian Studies

Topic: ʻO Wai o Hāloa?

Haʻawina 2

Lesson Focus and Goals:
- Students learn the makawalu process and apply it to notable figures in the story of Hāloa
- Students understand and acknowledge multiple forms of knowing and different ways to interpret concepts
  - Hoʻopukaku, kaona, and noa huna

Materials Needed:
- Internet access to wehewehe.org
- Notebook or digital form of note-taking

Learning Objectives:
- Students understand the story of Hāloanakalaukapalili, and how it shaped the Hawaiian worldview.
- Students understand the makawalu process and how to apply it in ʻŌlelo Hawaiʻi

Structure / Activity:
- Opening circle (name, hometown, and reason for taking this class)
- Acknowledgement and explanation of ʻŌlelo Noʻeau (ON) #203 (wise saying)
  - ʻAʻohe pau ka ʻike i ka hālau hoʻokahi
- Introduction to the moʻolelo (story) of Hāloa through the Kumulipo (origin chant)
  - Makawalu activity (groups or pairs, ideally (for the sake of time), but can be individual)
    - Papahānaumoku + group share out
    - Wākeakalani + group share out
    - Hoʻohōkūkalani + group share out
- Continuation of the moʻolelo of Hāloa + moʻokūʻauhau (genealogy)
- Acknowledgment and translations of ON #1447
  - Kalo kanu o ka ʻāina
    - Hoʻopukaku (literal translation)
    - Kaona (metaphorical translation)
    - Noa Huna (person interpretation)
- Makawalu activity
  - Hāloanakalaukapalili + group share out
- Closing Activity - One word to describe a new perspective of Hāloa

Lesson Reflections / Assessment:
- What is your noa huna of the Hāloa moʻolelo and ON #1447 (Kalo kanu o ka ʻāina) about the kalo plant in relation to the Hawaiian worldview?
- Compare and contrast your definitions of Papahānaumoku, Wākeakalani, Hoʻohōkūkalani, and Hāloanakalaukapalili with a partner, group, or the whole class. Are any parts of your definitions the same? If so, which parts?
  - Reflect on ON #203 (ʻAʻohe pau ka ʻike i ka hālau hoʻokahi). Did anyone have a “most correct” definition if your definitions were different?

MĀHELE O HĀLOA

Grade(s): 9-12, Post-Secondary

Subject(s): Agriculture, Botany, Sustainability, Hawaiian Studies

Topic: Parts and Planting Styles of Hāloa

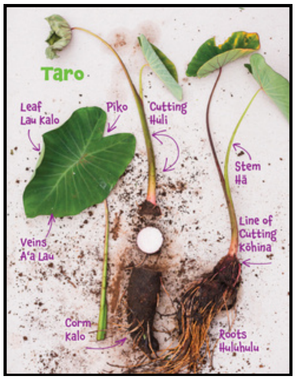
Haʻawina 3

Lesson Focus and Goals:
- Students learn the concept of nānā pono and apply nānā pono to:
  - Parts and life stages of Hāloa
  - Planting styles of Hāloa
    - Students make predictions about kalo growth and harvest

Materials Needed:
- Internet access to wehewehe.org
- Notebook or digital form of note-taking
- Māhele o Hāloa worksheet

Learning Objectives:
- Students apply the concept of nānā pono and how to apply nānā pono to agriculture
  - Students observe and make predictions of the environment based on planting styles of both individual kalo and patches of kalo

Structure / Activity:
- Class Opening - Emoji Activity
  - In groups, pairs, or individually, choose five emojis that represent Hāloa + group share out
- Acknowledgement and explanation of ʻŌlelo Noʻeau (ON) #203 (wise saying)
  - ʻAʻohe pau ka ʻike i ka hālau hoʻokahi
- Māhele o Hāloa worksheet
- Life stages of Hāloa
  - Predict when to harvest
  - Compare and contrast kalo grown for corm vs. leaf
- Planting styles of Hāloa
  - Individual huli
    - Predict the type of environment each planting style is best in
  - Kalo patches
    - Predict which patch has kalo grown for corm vs. leaf
- Closing Activity - Each student shares one terminology they learned



Lesson Reflections / Assessment:
- Based on the life stages of Hāloa, when is the ideal time to harvest kalo grown for corm? When is the ideal time to harvest kalo grown for leaves?
- Based on these planting styles, what type of environment do you think this kalo grows in?
  - Wet/rainy
  - Dry
  - Flooded/loʻi
- Name one Hāloa-related terminology you learned today (no repeats)!

TAXONOMY AND NOMENCLATURE

Grade(s): 9-12, Post-Secondary

Subject(s): Agriculture, Botany, Sustainability, Hawaiian Studies

Topic: Kalo Taxonomy and Nomenclature

Haʻawina 4

Lesson Focus and Goals:

- Students learn kalo taxonomy from both a Linnaean and Hawaiian perspective
- Reinforcement of makawalu through the concept of ʻohana
- Reinforcement of nānā pono
    - Sort kalo ʻohana by Hawaiian name, translation, and picture
- Introduction to kalo cultivar nomenclature and moʻolelo

Materials Needed:

- Internet access to wehewehe.org
- Notebook or digital form of note-taking
- Kalo ʻOhana worksheet

Learning Objectives:

- Students understand kalo taxonomy from both a Linnaean and Hawaiian perspective
- Students apply makawalu to the concept of ʻohana, and in turn how the term "ʻohana" was derived
- Students apply nānā pono to kalo ʻohana

Structure / Activity:

- Class Opening - Rapid Review (1-2 minutes)
    - In pairs or small groups, review what the makawalu process is
- Acknowledgement and explanation of ʻŌlelo Noʻeau (ON) #203 (wise saying)
    - ʻAʻohe pau ka ʻike i ka hālau hoʻokahi
- Overview of Linnaean taxonomy
    - Kalo classification from a Linnaean perspective
    - Subspecies, varieties, and cultivars
- Makawalu activity (groups or pairs, ideally (for the sake of time), but can be individual)
    - ʻOhana + share out
- Overview of Hawaiian taxonomy
    - Kalo classification from a Hawaiian perspective
    - Main kalo ʻohana
- Kalo ʻohana worksheet
- Nānā Pono
    - Compare and contrast features of different kalo ʻohana
- Moʻolelo of specific kalo cultivars
- Closing Activity - Choose a kalo in the māla for culminating project

Lesson Reflections / Assessment:

- Refresher - What is the Hawaiian term for the bud of the corm on a kalo plant?
- What is your noa huna of the term "ʻohana?"
    - Why do we translate ʻohana as a family (based on the moʻolelo of Hāloa)?
- What are some similarities and differences in the features of the kalo ʻohana?
- Based on the translations of these names, infer how these kalo got their names.
- These organisms (not all kalo) share the same name. Based on their characteristics, infer why they share the same name.

KILO, NĀNĀ PONO, AND MODERN KALO ISSUES

Grade(s): 9-12, Post-Secondary

Subject(s): Agriculture, Botany, Sustainability, Hawaiian Studies

Topic: Kilo, Nānā Pono, and Modern Issues

Haʻawina 5

Lesson Focus and Goals:

- Introduction to kilo
  - Introduction to culminating project
- Introduction to modern kalo issues and potential treatments
  - Nutrient deficiencies
  - Pests, pathogens, and diseases

Materials Needed:

- Internet access to wehewehe.org
- Notebook or digital form of note-taking
- Kilo Journal Template

Learning Objectives:

- Students understand the concepts of nānā pono and kilo
  - I ka nānā no a ʻike - By observing, we learn.
- Students learn about modern common kalo issues and potential solutions/treatments

Structure / Activity:

- Class Opening - WordCloud: What/who is Hāloa to you?
- Acknowledgement and explanation of ʻŌlelo Noʻeau (ON) #203 (wise saying)
  - ʻAʻohe pau ka ʻike i ka hālau hoʻokahi
- Overview of kilo and nānā pono
  - Fill out Day 1 of kilo journal
- Overview of common kalo issues
  - Nutrient deficiencies
  - Pests, pathogens and diseases
    - Predictions of which kalo growing areas are most affected
- Solutions to common kalo issues?
  - Treatments
  - Genetically Engineered (GE kalo)
  - Hybridization
- He aha kou mau manaʻo - What are your thoughts?
  - On GE kalo and hybridized kalo?
  - Should farmers be charged a fee to grow and sell kalo?
- Closing Activity - Share 1-2 standout features of the kalo you chose

Lesson Reflections / Assessment:

- What is the difference between kilo and nānā pono?
  - Using nānā pono, what is something unique to your kalo?
- Based on the reproduction, transmission, and lifestyle of this pest and pathogens, which kalo growing area(s) are most likely to be affected?
  - What pests and pathogens are most likely to affect your kalo?
- What are your thoughts on genetic engineering and hybridization to solve kalo issues?
  - Should we charge farmers a fee to grow and sell kalo?

KALO - MA UKA TO MA KAI

Grade(s): 9-12, Post-Secondary

Subject(s): Agriculture, Botany, Sustainability, Hawaiian Studies

Topic: Kalo from a Kai Perspective

Haʻawina 6

Lesson Focus and Goals:
- Students explore the reef flats of Keʻehi
- Students participate in mālama ʻāina (removal of invasive alga) and collect the byproducts for fertilizer
- Reinforcement of nānā pono
  - Observation of reef creatures
  - Comparison of kalo cultivars to sea creatures with the same name

Materials Needed:
- Kilo Journal
- Clothes and shoes that can get dirty/wet
- Refillable water bottles
- Hat, sunscreen, sun protection
- Dry bags and buckets

Learning Objectives:
- Students apply nānā pono to reef exploration
- Students develop hypotheses about plant growth
- Students make inferences about the functionality of names in the Hawaiian culture
  - Mauka and makai relationships

Structure / Activity:
- *Complete kilo journal before leaving for huakaʻi*
- Opening Circle - Grounding exercise and E Ho Mai
- Half of the students do reef exploration w/ Kēhaulani Kupihea
  - Nānā Pono reef fish, limu, and invertebrates
- Half of the students collect Gorilla Ogo to take home as fertilizer
- Student groups switch
- Closing Circle - Share one word describing your experience at Keʻehi and Oli Mahalo

Lesson Reflections / Assessment:
- Many kai creatures (some of which we saw) share their names with kalo cultivars (Manini, Moano, Hāpuʻu, ʻŌpelu, Manauea, etc.).
  - Make inferences for at least 3 of these names as to why they share their name with a kalo cultivar.
- The Gorilla Ogo (invasive alga) we collected today will be used as a fertilizer on your kalo as it is a good source of Calcium, Potassium, and Nitrogen.
  - Hypothesize which parts of kalo will be enhanced due to added nutrients.

KALO AS A MEA ʻAI

Grade(s): 9-12, Post-Secondary

Subject(s): Agriculture, Botany, Sustainability, Hawaiian Studies

Topic: Kalo as a Mea ʻAi

Haʻawina 7

Lesson Focus and Goals:

- Harvest, preparation, and replanting of kalo
- Students learn terminologies related to kuʻi kalo
- Students taste of the fruits of the labor (literally)
  - Taste test of various kalo products
- Reinforcement of nānā pono
  - Compare and contrast between kalo cultivars

Materials Needed:

- Kilo Journal
- Internet access to wehewehe.org
- Notebook or digital form of note-taking
- Papa Kuʻi ʻAi, Pōhaku Kuʻi ʻAi, utensils
- Kalo word search and crossword worksheets

Learning Objectives:

- Students learn how to harvest kalo, prepare huli, and replant kalo
- Students learn the process of kuʻi kalo and associated terminologies
- Students taste various kalo products
  - Nānā pono the taste of kalo cultivars

Structure / Activity:

- *Complete kilo journal, harvest kalo cultivars while in the māla*
- Class Opening - What does food mean to you?
- Acknowledgement and explanation of ʻŌlelo Noʻeau (ON) #203 (wise saying)
  - ʻAʻohe pau ka ʻike i ka hālau hoʻokahi
- Preparation of kalo for eating and replanting
  - Cutting huli
  - Cleaning corms and leaves
- Overview of ways to eat kalo and tasting
  - Corm products
    - Poi, Paʻi ʻai, Kūlolo, Kalo Paʻa, Kipi Kalo
  - Leaf products
    - Laulau
    - Lūʻau
- Kuʻi kalo word search and crossword puzzle
- Demonstration of kuʻi kalo on student-made papa kuʻi ʻai
- Class Closing - Compare and contrast at least two cultivars
  - Describe the color of the kalo products
  - Describe the texture of the kalo products (grainy, gummy, smooth, etc.)
  - Describe the process of your kuʻi kalo experience. Was this cultivar grown for its corm or leaves?

Lesson Reflections / Assessment:

- Kūkākūkā - How does Hāloa nourish your mind (manaʻo), body (kino), and soul (ʻuhane)?
- What are some similarities and differences between kalo cultivars in the context of food?
  - Texture (grainy, gummy, smooth, etc.)
  - Color? (purple, gray, pink, white, etc.)
  - Taste? (sweet, bitter, sour, salty, etc.)
- Now that you've embarked on two huakaʻi makahiʻo, learned the moʻolelo of Hāloa and the process of growing kalo, ʻo wai o Hāloa to you?

KALO SYMPOSIUM

Grade(s): 9-12, Post-Secondary

Subject(s): Agriculture, Botany, Sustainability, Hawaiian Studies

Topic: Presentation of Findings

Haʻawina 8

Lesson Focus and Goals:

- Haumāna become the kumu
  - Students recount the moʻolelo of Hāloa and share with community members
  - Students present findings of their kilo journals and their chosen kalo cultivar with its respective moʻolelo
  - Students demonstrate the process of kuʻi kalo to community members
  - Students provide various forms of kalo as food to community members

Materials Needed:

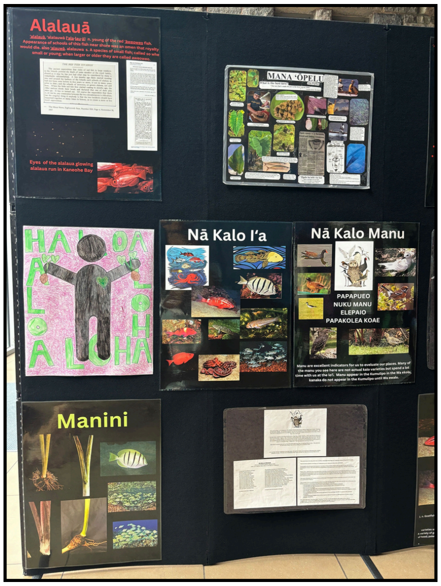
- Kilo Journal
- Culminating project/presentation
- Notebook or digital form of note-taking
- Papa Kuʻi ʻAi, Pōhaku Kuʻi ʻAi, utensils

Learning Objectives:

- Students will synthesize information from a culminating project and present their findings
- Students will reflect on their experiences of this unit and reflect applications to the real world
  - Nānā pono, kilo, and makawalu

Structure / Activity:

- *Complete kilo journal*
- Sample symposium schedule
  - Welina - Oli and Pule
  - Keynote speaker(s) - Community partners
  - Tour of māla
  - Presentations
    - Manini and Lauloa ʻohana
  - Break
  - Presentations
    - ʻEleʻele and piko ʻohana
  - Break
  - Students demonstrate kuʻi kalo
    - Taste test of kalo products
  - Closing - Oli Mahalo



Lesson Reflections / Assessment:

- Now that we are complete with this unit, reflect on the following:
  - What does food mean to you? What new perspectives on food and your relationship/role to food do you have now?
  - Would you consider pursuing a career in agriculture, botany, or sustainability? If so, please specify and why.
- Although not required, the continuation of the nānā pono, kilo, and makawalu practices is highly encouraged. How can you apply these concepts to other aspects of the natural world?