



Growing healthy keiki, schools, and communities
A program of the Kōkua Hawai'i Foundation

THE HAWAIIAN GARDEN

Student Workbook

Grade 4

Student's Name: _____

Teacher's Name: _____

Date: _____

www.kokuahawaiifoundation.org/aina

ĀINA In Schools is a farm to school initiative launched in 2006 that connects children to their local land, waters, and food to grow a healthier Hawai'i. In addition to encouraging the use of locally grown fruits and vegetables in school meals and snacks, the program includes a standards-based nutrition, garden, and compost curriculum that empowers children to grow their own food, make informed food decisions, and reduce waste. ĀINA In Schools also promotes field trips to local farms, chef cooking demonstrations in classrooms, as well as waste reduction, garden, and cooking educational opportunities for families and community members.

Six Integrated Program Components

Core components:

- **Nutrition Education** empowers students to try new foods and make healthy choices that will last a lifetime.
- **Garden-Based Learning** transforms the school garden into a learning laboratory where all subjects are explored.
- **Healthy Food on Campus** increases local, fresh products in school lunches and snacks to provide healthy choices and support local farms.

Additional components:

- **Agricultural Literacy** introduces students to where their food comes from and who grows and prepares their food.
- **Waste Reduction** reduces, reuses, and recycles waste in gardens, schoolyards, cafeterias, and classrooms.
- **Family & Community Outreach** raises awareness to support student, family, and community health and wellness.



"As an educator, I appreciate your program on so many levels. Your program does more than simply address state standards, but gives our students meaning and relevance as they study and engage in a living classroom where they literally see the fruits (and vegetables!) of their labor."

School Principal

ĀINA In Schools Curriculum

- The ĀINA In Schools curriculum includes 8 lessons per year for grades K-6 that are standards-based, multi-subject, and hands-on. The curriculum supports a variety of learning styles and covers topics from the Nutrition, Garden, and Waste Reduction components. Successive units enable students to build on previous knowledge while developing a solid foundation in 'āina-based systems thinking. Nutrition and garden lessons also include close to the source, healthy snacks that reinforce key concepts.
- ĀINA In Schools Curriculum Trainings for Educators and online access to all materials via the Kōkua Hawai'i Foundation website enable educators to bring the ĀINA In Schools experience to students throughout Hawai'i and beyond. Lessons meet Common Core and HCPSIII standards for grades K-6 and are easily adaptable for other grades.

Key KHF Farm to School Partnerships

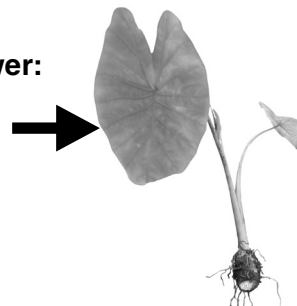
- Co-leader and founding partner of the **O'ahu Farm to School Network:** www.oahufarmtoschool.org.
- Founding member of the **Hawai'i Farm to School & School Garden Hui:** www.hawaiischoolgardenhui.org.
- Hawai'i Core Partner for the **National Farm to School Network:** www.farmtoschool.org.
- Kōkua Hawai'i Foundation is also an Advisory Committee member of the **Hawai'i Environmental Education Alliance:** www.heea.org.

I have been at this school since grade: K 1 2 3 4 (circle one)

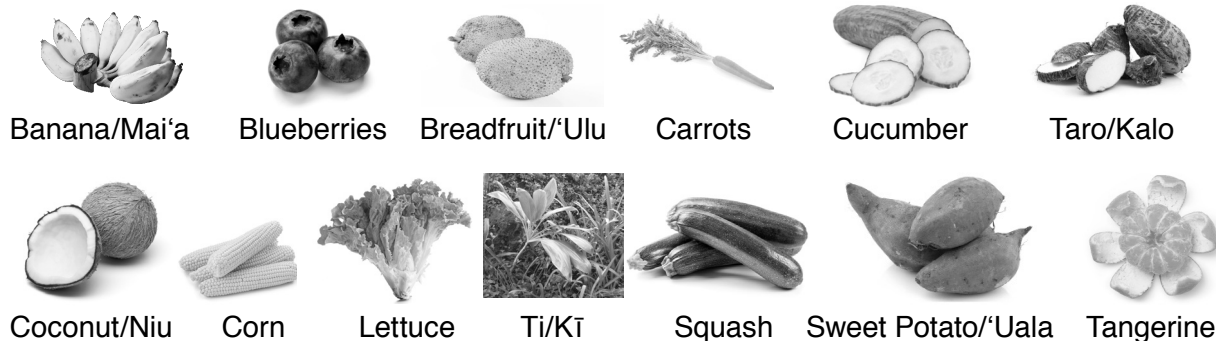
This Pre-Unit Survey is to see what you already know about these topics. It is ok if you don't know any of the answers. You will be learning about these topics this year. Try your best and have fun!

1. What part of the kalo is the arrow pointing to? Circle ONE answer:

- a. Kohina
- b. Lau
- c. Huli
- d. 'Oha



2. Circle the plants that were brought to Hawai'i in canoes by Polynesian voyagers:



3. Draw a line to match each word to its correct definition:

- | | |
|--------------------------|---|
| a. Polynesian-Introduced | 1. Plants that evolved in Hawai'i and can only be found in Hawai'i |
| Canoe Plants | 2. Plants at risk of extinction |
| b. Ahupua'a | 3. Non-native species that were brought to Hawai'i by Polynesian voyagers |
| c. Endangered | 4. To take care of, preserve, and protect |
| d. Mālama | 5. A common subdivision of land, usually extending from the top of the mountains to the sea |
| f. Endemic | |

4. How would you practice the Hawaiian value of ho'omau in the garden? Circle ONE answer:

- a. Continue growing native Hawaiian plants at school and home
- b. Work together with others to harvest, prepare, and cook food from the garden
- c. Give vegetables you grew as a gift to your teacher
- d. Water all the plants as fast as you can

5. What are two uses for the Kī (Ti) plant? Circle TWO answers:

- a. Garden signs
- b. Ti leaf plates
- c. To wrap food and gifts in a pū'olo (bundle)
- d. Butterfly host plant

6. Do you like gardening? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

7. Do you like eating fruits and vegetables? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

8. Do you like cooking? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

9. Do you like making compost? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

10. Do you like 'ĀINA Lessons? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

11. Do you and your family grow any food at home? Circle: Yes or No

If yes, please list the foods you grow at home: _____

12. Do you compost at home? (compost pile, worm bins, or bokashi bucket) Circle: Yes or No

13. How often do you eat fruits and vegetables? Circle ONE answer:

- a. I don't eat fruits and vegetables
- b. 1-2 times a week
- c. 3-5 times a week
- d. Every day

14. Circle the fruits and vegetables that you like to eat:

- Apple Cantaloupe Banana/Mai'a Blueberries Avocado Coconut/Niu Guava Dragonfruit
 Mango Passionfruit/Liliko'i Honeydew Rambutan Tangerine Strawberry Blackberries
 Lemon Starfruit Breadfruit/'Ulu Lychee Orange Papaya Pineapple Watermelon
 Radish Spinach Basil Beans Broccoli Squash Zucchini Sweet Potato/'Uala Corn Tomato
 Lettuce Watercress Taro/Kalo Cucumber Green Beans Asparagus Carrots Celery Kale

Other: _____

15. Describe what 'āina means to you: _____

16. List two ways that you take care of the 'āina:

- 1. _____
- 2. _____

17. Complete the following sentence:

My favorite thing about 'ĀINA In Schools Lessons is _____

Dear Parent or Caregiver:

This semester, 4th graders will be participating in the first four of eight Hawaiian Garden lessons being delivered by volunteers of ĀINA In Schools, a program of Kōkua Hawai'i Foundation. ĀINA In Schools is a farm to school initiative that connects children to their local land, waters, and food to grow a healthier Hawai'i. Program components vary from school to school and include nutrition education, garden-based learning, healthy snacks, farm field trips, chef visits, waste reduction, and family and community outreach.

Although the lessons are delivered once a month, the students will be continually engaged in between lessons with regular garden activities that include watering, weeding, making observations, spending time in the garden and learning about Polynesian - introduced and native plants.

Photos and Media Releases: By now each of you should have received a Kōkua Hawai'i Foundation Media Release Form. We hope that you have this form and have submitted it to your child's classroom teacher. From time to time, KHF takes photos/videos of our lessons to highlight activities that are noteworthy.

To keep yourself up to date on what your child is doing in ĀINA, we suggest putting this up on your refrigerator or bulletin board and follow up as the lessons are delivered. You can help reinforce, engage, and learn along with your child by going over the lessons and activities after each lesson. A unit summary and suggested questions/activity for each lesson are listed below.

Mahalo!

In The Hawaiian Garden

students will plant and care for kalo (taro), 'uala (sweet potato), 'ulu (breadfruit), kī (ti leaves), and one or more species of native Hawaiian plants, and discuss the significant role of these plants in Hawaiian culture and history. Throughout the school year, they will care for their gardens, then harvest, prepare, and enjoy the edible crops during the spring semester. Each lesson begins with the offering of a Hawaiian oli (chant) as protocol and introduces a different Hawaiian value for students to practice, including pono, kuleana, aloha, lokomaika'i, laulima, mālama, ha'aha'a, and ho'omau. Additional key concepts include 'āina, ahupua'a, mahi'ai, makana, plant varieties, nutrients, native (endemic, indigenous), introduced (Polynesian-introduced, recent introduction), endangered, extinct, and invasive species.



Lesson 1 - The Kalo Garden

In this lesson, students discuss ancestral and modern day life in Hawai'i, the significant role of kalo (taro) in Hawaiian culture and history, and the Hawaiian value pono. They plant their kalo garden, prepare their 'uala (sweet potato) garden for planting, and enjoy a snack of fresh poi served on ti leaf plates.

Questions to discuss with your child:

- What new information did you learn about kalo?
- What does pono mean and how did you practice this Hawaiian value today?

Suggested home activity:

- Learn more about the kalo by visiting the website: www.canoeplants.com/kalo.html
- Visit your neighborhood lo'i or check the KHF Field Trip destination for a list at kokuahawaiifoundation.org/fieldtrips/
- If feasible, connect with a kalo farmer and grow some kalo.



Lesson 2 - The 'Uala Garden

In this lesson, students discuss the significant role of 'uala (sweet potato) in Hawaiian culture and history, and the Hawaiian value kuleana. They plant their 'uala garden, care for their kalo garden, and enjoy a snack of cooked 'uala served on ti leaf plates.



Questions to discuss with your child:

- What new information did you learn about 'uala?
- What does kuleana mean and how did you practice this Hawaiian value today?

Suggested home activity:

- Plant 'uala in a garden bed or bucket.
To learn more, visit the website:
www.canoeplants.com/uala.html

Lesson 3 - The 'Ulu Tree (Planting or Care)

In this lesson, students discuss the significant role of 'ulu (breadfruit) as a food crop with a variety of other important uses, and the Hawaiian value laulima. They will care for their kalo and 'uala gardens and prepare for the 'ulu tree planting or dedication and enjoy a snack of cooked 'ulu served on ti leaf plates.



Questions to discuss with your child:

- What new information did you learn about 'ulu?
- What is laulima and how can you practice this Hawaiian value?

Suggested home activity:

- Learn more about 'ulu by visiting the website:
www.canoeplants.com/ulu.html
- Make or prepare an 'ulu dish or use it as substitute for potatoes. See 'ono 'ulu recipes from 'ĀINA Chefs and KHF Staff at kokuahawaiifoundation.org/resources/category/recipes

Lesson 4 - Kī (Ti) Plants

In this lesson, students discuss the significant role of kī (ti plants) in Hawaiian culture and history, and the Hawaiian value lokomaika'i. They will plant their kī plants and care for their kalo and 'uala gardens and their 'ulu tree. They will learn to use ti leaves as wrapping, and take home a ti leaf cutting to share and plant with their families.



Questions to discuss with your child:

- What new information did you learn about kī today?
- How did you practice being lokomaika'i?

Suggested home activity:

- Learn more about kī by visiting the website:
www.canoeplants.com/ki.html
- Your child will be bringing home a kī cutting after the lesson. Plant horizontally or vertically at least 2 inches deep in a pot or in your garden.

If you have any questions or are interested in becoming an 'ĀINA In Schools docent, please do not hesitate to ask.

To learn more about 'ĀINA In Schools at your child's school, please contact your school's 'ĀINA Team Coordinator, or contact:



'ĀINA In Schools
aina@kokuahawaiifoundation.org

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Although the lessons are delivered once a month, the students will be engaged in between lessons with regular garden activities that include watering, weeding, making observations, spending time in the garden, and learning about native plants.

Photos and Media Releases: By now each of you should have received a Kōkua Hawai'i Foundation Media Release Form. We hope that you have completed this form and have submitted it to your child's classroom teacher. From time to time, KHF takes photos/videos of our lessons to highlight activities that are noteworthy.

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Mahalo!

In the **Hawaiian Garden** unit, students will plant and care for kalo (taro), 'uala (sweet potato), 'ulu (breadfruit), kī (ti leaves), and one or more species of native Hawaiian plants, and discuss the significant role of these plants in Hawaiian culture and history. Throughout the school year, they will care for their gardens, then harvest, prepare, and enjoy the edible crops during the spring semester. Each lesson begins with the offering of a Hawaiian chant (oli) as protocol and introduces a different Hawaiian value for students to practice, including pono, kuleana, aloha, lokomaika'i, laulima, mālama, ha'aha'a, and ho'omau. Additional key concepts include 'āina, ahupua'a, mahi'ai, makana, plant varieties, nutrients, native (endemic, indigenous), introduced (Polynesian-introduced, recent introduction), endangered, extinct, and invasive species.



Lesson 5 - 'Uala Leaf Harvest

In this lesson, students discuss the benefits of harvesting and eating 'uala leaves, and the Hawaiian value, aloha (love, respect, protect). They will work as a community to care for their gardens and prepare and eat palula (cooked 'uala leaves).

Questions to discuss with your child:

- What does aloha mean and how can you practice this Hawaiian value?
- What are some of the benefits of using locally grown foods instead of imported ones?

Suggested home activity:

- Prepare and make 'Uala Leaf Salad. Recipe and instructions: www.motherearthnews.com/real-food/sweet-potato-leaves-recipe-zb0z11zwar.aspx



Lesson 6 - Native Hawaiian Plants

In this lesson, students discuss Hawai'i's unique natural environment, learn about native Hawaiian and Polynesian-introduced plants, and discuss the Hawaiian value, mālama (to care for). They will plant one or more native plants on campus and care for their kalo, 'uala, 'ulu, and kī plants. They will sample a healing herbal tea made from leaves of the endemic māmaki tree.

Questions to discuss with your child:

- What is the difference between native and introduced plants?
- What does mālama mean and how do you practice this Hawaiian value?

Suggested home activity:

- Learn more about native plants by visiting: www.nativeplants.hawaii.edu/
- Learn more about invasive species in Hawai'i by visiting: www.dlnr.hawaii.gov/hisc/info/



Lesson 7 - 'Uala Harvest

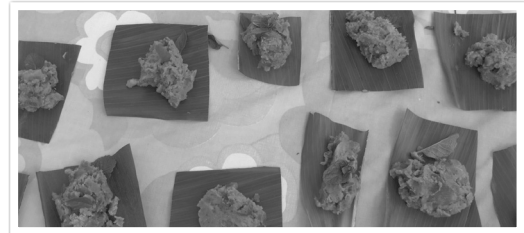
In this lesson, students review the importance of 'uala and discuss the Hawaiian value, ho'omaika'i (grateful; to improve, correct, perfect). They work as a community to care for their gardens and harvest, cook, and eat 'uala roots.

Questions to discuss with your child:

- How did you work as a community today?
- What does ho'omaika'i mean and how do you practice this Hawaiian value?

Suggested home activity:

- Prepare and make koele palau, a treat made from cooked, mashed 'uala mixed with coconut milk. Instructions will be provided to your child after the lesson.



Lesson 8 - Kalo Harvest

In this lesson, students review the importance of kalo and discuss the Hawaiian value, ho'omau (to continue, perpetuate, persevere). They work as a community to care for their gardens and harvest their kalo plants. Kalo corms (kalo or makua) and leaves (lau) are cooked and all participating classes enjoy their snack together.

Questions to discuss with your child:

- Have your child share their most memorable experience with their Hawaiian gardens this school year.
- What does ho'omau mean and how do you practice this Hawaiian value?

Suggested home activity:

- Connect with ku'i 'ai practitioners and sample a taste of pa'i 'ai, hand pounded kalo.



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'ĀINA In Schools
Program



aina@kokuahawaiifoundation.org

I WILL BE SAFE

*

I WILL BE KIND

*

**I WILL HAVE
AN OPEN MIND**

*

**I WILL USE
MY TIME WELL**

E Hō Mai

By Edith Kanaka'ole

This well-known Hawaiian oli (chant), often expressed at the beginning of an endeavor, seeks to connect us with knowledge from above, within, and that which is hidden. In preparation for offering the oli, have students stand tall and straight with their hands at their sides, focus their thoughts on the present moment, and offer the oli three times. Each successive repetition of the oli is sung at a higher pitch than the last.

E hō mai ka 'ike mai luna mai ē
'O nā mea huna no'eau o nā mele ē
E hō mai, e hō mai, e hō mai ē

*Give forth knowledge from above
Every little bit of wisdom contained in song
Give forth, give forth, oh give forth*



Gather in the classroom or outside in the gardens to prepare for each lesson by offering the oli.

Used with permission from the Edith Kanaka'ole Foundation



KEY TERMS AND CONCEPTS

Ahupua'a - A common subdivision of land, usually extending from the top of the mountains (mauka) to the sea (makai) and containing the resources required for survival; a watershed

'Āina - Land; that which feeds, nourishes, and sustains us (e.g., food, water, air)

Huli - Portion of the kalo that is planted

Kalo - Hawaiian word for taro; a staple Hawaiian food and symbolic of the elder sibling of the Hawaiian people

Mahi'ai - Farmer

'Ō'ō - Digging stick used for farming

Oli - Chant

Poi - Cooked, pounded kalo mixed with water

Pono - Excellence, wellbeing, correct or proper procedure, to behave respectfully

Variety - A type of plant showing similar characteristics to, and only slightly different characteristics from the species plant

Directions: Use this space to record your notes, drawings, and observations.

Kalo - Taro

A Mo'olelo of Papa, Wākea, and Hāloa

In early Hawaiian time there was Wākea (sky father) and Papahānaumoku (earth mother) and where they meet at the horizon the Hawaiian Islands were born. Papa and Wākea also gave birth to Ho'ohōkūkālani who represents the creation of stars in the sky. When it was her time, Ho'ohōkūkālani becomes hāpai (pregnant) but sadly her child is born premature and does not survive. They buried the body of the child on the side of their hale (house) and from that spot grew the first kalo plant. They named the kalo plant Hāloanakalaukapalili, which means the long stalk and quivering leaf. Soon after, Ho'ohōkūkālani becomes hāpai again and this time gives birth to a healthy child. This child was given the name Hāloa, meaning long breath. Hāloa is seen as the first Hawaiian chief and ancestor of all Hawaiian people. The two siblings grow up together, the kalo taking care of and feeding Hāloa, the child, and Hāloa taking care of his older sibling, Hāloanakalaukapalili, the kalo plant.

Two of the lessons this mo'olelo teaches us are mālama 'āina (to respect and care for all



that nourishes) and kuleana (responsibility) to care for our elders. Older than the Hawaiian people is Hāloa, older than Hāloa is the kalo plant, older than the kalo plant are the Hawaiian Islands, and older than the Hawaiian Islands are the elemental forces of nature: the earth, sky, and stars. We must mālama and practice our kuleana to all of these things.

SOURCES:

Handy, E. S., Handy, E. G., & Pukui, M. K. (1972). *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Honolulu: Bishop Museum Press.

Malo, D. (1951). *Hawaiian Antiquities: Mo'olelo Hawai'i*. Honolulu: Bishop Museum Press.

Pukui, M. K., & Elbert, S. H. (1986). *Hawaiian Dictionary: Hawaiian-English, English-Hawaiian*. Honolulu: University of Hawaii Press.

Background Information about Mo'olelo:

Mo'olelo and ka'ao are what we understand today as Hawaiian stories and legends. Mo'olelo comes from the words mo'o and 'ōlelo which mean a continuum of talk, as all stories in ancient times were oral, not written.

Today the sharing of mo'olelo can help us connect to our place by uncovering the behaviors and patterns of the people of old Hawai'i. In mo'olelo there is always kaona— the hidden lessons and deeper meanings within stories. What can stories of plants and animals, valley walls and mountain peaks, and the winds and the rains teach us?

Kalo Plant Parts

Part 1 Directions: Label the parts of the kalo plant with their Hawaiian and English names using the words in the word list.

Word List

- 'ā'ā (huluhulu) - roots
- hā - petiole/leaf stalk
- 'i'o - flesh of corm
- kalo (makua) - corm
- keiki ('oha) - bud/offshoot
- kohina - top of corm (area of growth)
- lau (lū'au) - leaf
- piko - where hā joins lau

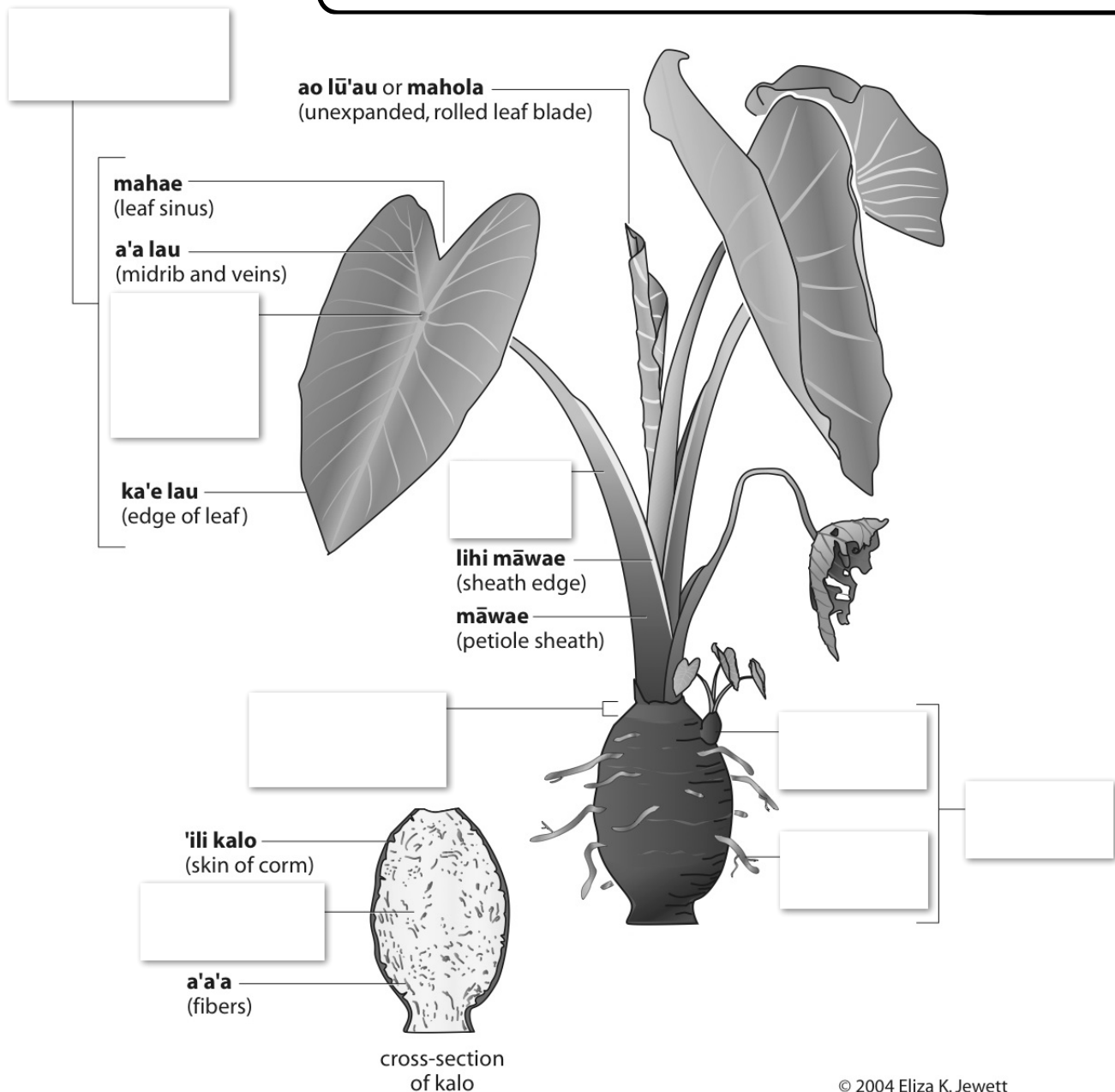


Image created by and used with permission from Eliza K. Jewett.



Kalo Reflection

Part 2 Directions: Fill in your answers to the questions below.

1. Describe the importance of kalo in Hawai'i: _____

2. Describe your opinion of how the poi tasted: _____

3. What does PONO mean? _____

4. Describe at least one specific example of how you or someone else practiced PONO today:

5. What was your favorite part about The Kalo Garden lesson? _____



KEY TERMS AND CONCEPTS

Kuleana - Privilege, responsibility, area of responsibility

Lau - Leaf; vegetative cutting or slip of the 'uala plant, used to propagate 'uala

Mahi'ai - Farmer

Node - The part of a plant stem from which one or more leaves emerge, often forming a slight swelling or knob on the stem

'Uala - Hawaiian word for sweet potato; refers to Hawaiian varieties of sweet potato; parts of the plant include the ka ('uala vine), lau (leaf), maka (root bud from node), pua (flower), 'uala (sweet potato root)

Variety - A type of plant showing similar characteristics to, and only slightly different characteristics from the species plant

Directions: Use this space to record your notes, drawings, and observations.

'Uala - Sweet Potato

A Mo'olelo of Kamapua'a the Hawaiian Pig God

Kamapua'a is from the valley of Kaliuwa'a, Kaluanui on the island of O'ahu. Kamapua'a is a pig-god who is able to change his body into many kinolau which are forms of nature a supernatural being can take. Supernatural beings that possess magical powers are known throughout Hawaiian mo'olelo as kupua. Kamapua'a could change from a boar to the humuhumunukunukuapua'a fish, from plant forms such as a kūkui tree to even a handsome man. Kamapua'a is known around Hawai'i for his mischievous nature.

A well known mo'olelo of Kamapua'a tells of his many battles against the O'ahu chief 'Olopana. Kamapua'a desired to steal 'Olopana's kapu (sacred) chickens reserved only for the chief. In one night it was said that Kamapua'a could steal all 'Olopana's sacred chickens in an entire district. 'Olopana, furious that a pig was stealing his kapu chickens, sent his people from all over O'ahu to capture and bring Kamapua'a to him to be killed for his wrongdoings. Each time Kamapua'a was captured his grandmother Kamaunuanoho chanted his name-chant and each time Kamapua'a broke free and escaped.



Kamaunuanoho called forth the many kinolau (body forms) of Kamapua'a such as the kūkui tree, ama'uma'u fern, the shark and the fish.

Did you know that a kinolau of Kamapua'a also exists in the sky? The big, dark, and round clouds that sit low on the mountain tops are called ao (cloud) pua'a (pig) because they resemble the heavy belly of Kamapua'a. 'Uala (sweet potato) is also known as a kinolau of Kamapua'a. If you look at the leaf it resembles the shape of his head and snout.

SOURCES:

Fornander, A. (1916-1920) *Collection of Hawaiian Antiquities and Folklore, Vol. 5*. Honolulu: Bishop Museum.

Kame'elehiwa, L.K. (1996). *A Legendary Tradition of Kamapua'a The Hawaiian Pig-God*. Honolulu: Bishop Museum Press.

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Today the sharing of mo'olelo can help us connect to our place by uncovering the behaviors and patterns of the people of old Hawai'i. In mo'olelo there is always kaona— the hidden lessons and deeper meanings within stories. What can stories of plants and animals, valley walls and mountain peaks, and the winds and the rains teach us?

'Uala Plant Parts

Part 1 Directions: Label the parts of the 'uala plant with their Hawaiian and English names using the word list.

Word List

ka - vine maka - root bud pua - flower
lau - leaf from node 'uala - sweet potato





'Uala Reflection

Part 2 Directions: Fill in your answers to the questions below.

1. Describe the importance of 'uala in Hawai'i: _____

2. Describe your opinion of how the 'uala tasted: _____

3. What does KULEANA mean? _____

4. Describe at least one specific example of how you or someone else practiced KULEANA today: _____

5. What was your favorite part about The 'Uala Garden lesson? _____



KEY TERMS AND CONCEPTS

Ho'okupu - Offering

Kumulā'au or Lā'au- Tree

Laulima - Cooperation, to work together

Mahi'ai - Farmer

Ulu - to grow, increase, spread

'Ulu - Hawaiian word for breadfruit

Directions: Use this space to record your notes, drawings, and observations.

'Ulu- Breadfruit

A Mo'olelo of the Gift of Kū

Mary Kawena Pukui tells of a Hawaiian myth which explains the origin of the 'ulu tree as a gift from the god Kū. This story takes place on the south coast of the island of Hawai'i at a place called Kawa'aloa, Kona.

At a time of starvation and famine in Hawai'i, the god Kū buried himself in the earth near his hale (house). Kū told his wife, "My body will be the trunk and branches. My hands will be the leaves, the heart inside the fruit will be my tongue. Roast the fruit, soak it, beat off the skin, and eat some, and feed our children." It was from his head that the tree grew bearing the 'ulu fruit, shaped like a man's head and the leaves shaped like hands. This story is known as the gift from Kū because Kū sacrificed himself to feed his family in a time of famine.

'Ulu is such an important plant to the people of Hawai'i that it has multiple Hawaiian gods associated with it. 'Ulu is also known as Kameha'ikana, a Hawaiian goddess in the form of Haumea—the elemental force and god of regeneration, fertility, and birth.



SOURCES:

Kamakau, S. M. (1964). *Ka Po'e Kahiko: The People of Old*. Honolulu: Bishop Museum Press.

Kamakau, S. M. (1991). *Tales and Traditions of the People of Old: Nā Mo'olelo a ka Po'e Kahiko*. Honolulu: Bishop Museum Press.

Handy, E. C., Handy, E. G., & Pukui, M. K. (1972). *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Honolulu: Bishop Museum Press.

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DIG

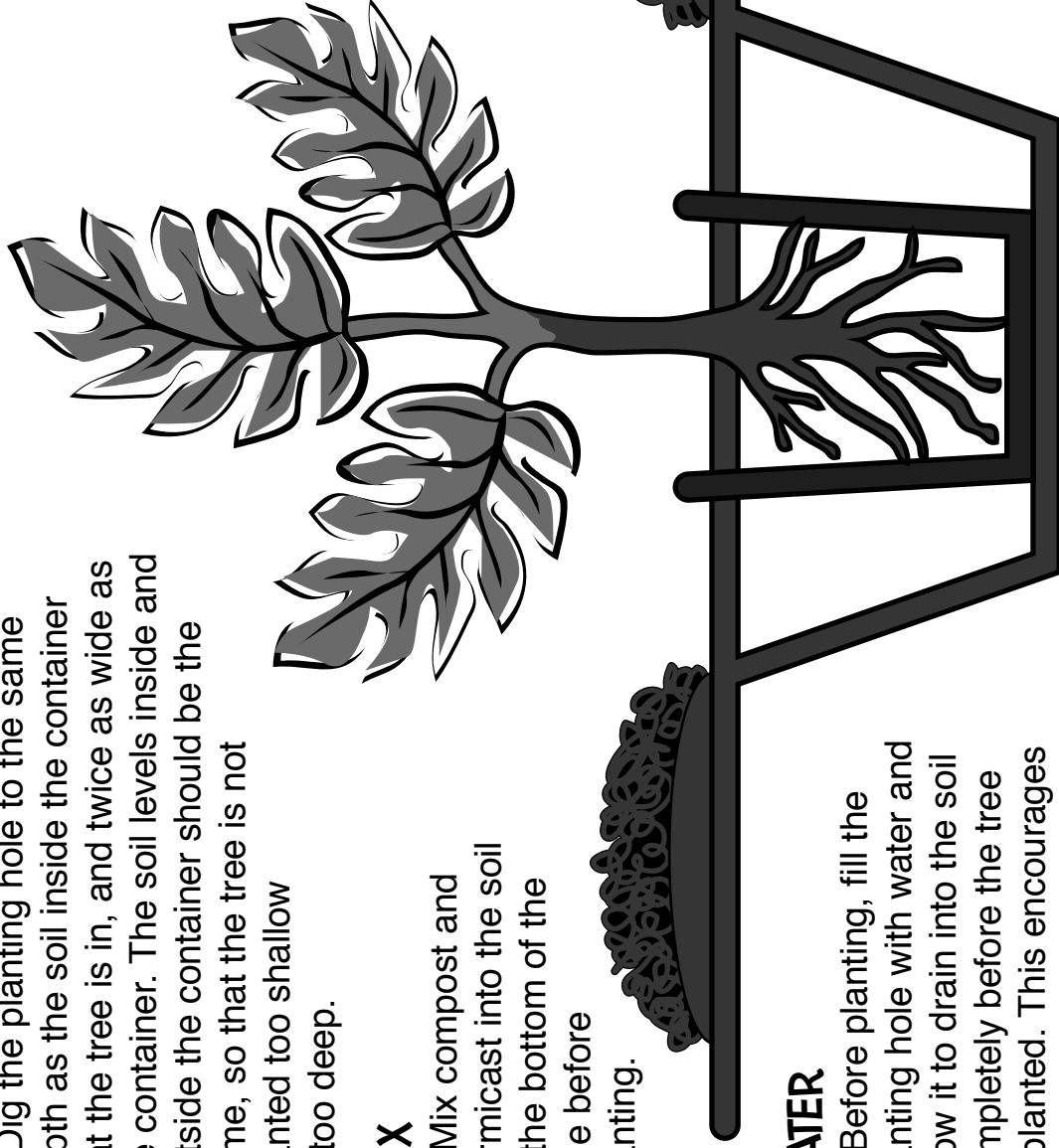
1. Dig the planting hole to the same depth as the soil inside the container that the tree is in, and twice as wide as the container. The soil levels inside and outside the container should be the same, so that the tree is not planted too shallow or too deep.

MIX

2. Mix compost and vermicast into the soil at the bottom of the hole before planting.

WATER

3. Before planting, fill the planting hole with water and allow it to drain into the soil completely before the tree is planted. This encourages downward growth of the roots.



PLANT

4. Gently remove the tree from its container before planting. Place the tree in the planting hole and make sure it is standing completely vertical. Gently and firmly fill the hole with soil.

MULCH

5. Use soil and mulch (e.g., wood chips, about 4" to 6" deep) to form a "doughnut-shaped" berm around the tree at the tree's drip line (the farthest reach of its leaves) in order to form a "water well" and discourage weeds. Be sure that mulch does not come in contact with the trunk, which could cause rotting.





'Ulu Reflection

Directions: Fill in your answers to the questions below.

1. Describe the importance of 'ulu in Hawai'i: _____

2. Describe your opinion of how the 'ulu tasted: _____

3. There is a Chinese proverb that says, "The best time to plant a tree was twenty years ago. The second best time is today." Why is it important to plant trees? _____

4. What does LAULIMA mean? _____

5. Describe at least one specific example of how you or someone else practiced LAULIMA today: _____

6. What was your favorite part about The 'Ulu Tree lesson? _____



KEY TERMS AND CONCEPTS

Kī - Hawaiian word for ti plants

Lā'ī - Ti leaves

Lokomaika'i - Kind, generous

Mahi'ai - Farmer

Makana - Gift

Pū'olo - Bundle, parcel

Directions: Use this space to record your notes, drawings, and observations.

Kī - Ti

A Mo'olelo of the Menehune of Kaimukī, O'ahu

Have you been to the place of Kaimukī on the south shore of O'ahu? Kaimukī is briefly mentioned in the legendary tale of Pele and Hi'iaka as Hi'iaka is traveling across the islands of Hawai'i in search of Pele's lover, Lohi'au. As Hi'iaka made her way through O'ahu, she reached Kaimukī. Kaimukī was considered a wild region with heavy boulders and chosen by menehune for a special purpose. Menehune were a race of small people who worked at night, building fish ponds, roads, and temples.

It was said that if the work was not finished in one night, it remained unfinished. In this mo'olelo, menehune chose Kaimukī as a stronghold to build their famous imu (underground ovens) for cooking the root of the kī (ti). The root was cooked and eaten like sugarcane. Because of the rocky foundation of Kaimukī, the imu full of kī would remain undisturbed by the mischievous deeds of the pig-god Kamapua'a who loved to steal the fruits of others' labor.



From this mo'olelo we learn how the place of Kaimukī got its name. Ka (the), imu (underground oven), of kī (ti).

Sources:

Emerson, N. B. (1997). *Pele and Hiiaka: A Myth From Hawaii*. Honolulu: 'Ai Pōhaku Press.

Pukui, M. K., & Elbert, S. H. (1986). *Hawaiian dictionary: Hawaiian-English, English-Hawaiian*. Honolulu: University of Hawaii Press.

Find the mo'olelo and historical information about your school's ahupua'a using these sources:

Pukui, M. K., Elbert, S. H., & Mookini, E. T. (1974). *Place Names of Hawaii*. Honolulu: University Press of Hawaii.

Sterling, E. P., & Summers, C. C. (1978). *Sites of Oahu*. Honolulu: Bishop Museum Press.

Background Information about Mo'olelo:

Mo'olelo and ka'ao are what we understand today as Hawaiian stories and legends. Mo'olelo comes from the words mo'o and 'olelo which mean a continuum of talk, as all stories in ancient times were oral, not written.

Today the sharing of mo'olelo can help us connect to our place by uncovering the behaviors and patterns of the people of old Hawai'i. In mo'olelo there is always kaona— the hidden lessons and deeper meanings within stories. What can stories of plants and animals, valley walls and mountain peaks, and the winds and the rains teach us?



Kī Reflection

Part 1 Directions: Fill in your answers to the questions below.

1. Describe the importance of kī in Hawai'i: _____

2. How can you use the makana (gift) wrapping technique to reduce waste? _____

3. What does LOKOMAIKA'I mean? _____

4. Describe at least one specific example of how you or someone else practiced LOKOMAIKA'I today: _____





5. What was your favorite part about Kī (Ti) Plants lesson? _____

Hawaiian Canoe Plants

Word List

kalo kī 'uala 'ulu breadfruit sweet potato taro ti

Part 2 Directions: Next to each canoe plant, list the Hawaiian and English names and 2-3 uses or facts about the plant. Color the diagram of each plant.

Diagram	Hawaiian name	English name	List 2-3 uses or facts
			
			
			
			



KEY TERMS AND CONCEPTS

Aloha - Love, compassion; to show kindness, mercy, and affection; a word of greeting or farewell in recognition of life in another; a way of life, connecting us to each other and all that exists

Aloha Spirit - Harmony of soul, heart, and mind within and among all people and things

Community - A social group whose members reside in a specific locality, and share government or common characteristics, interests, culture, and/or historical heritage

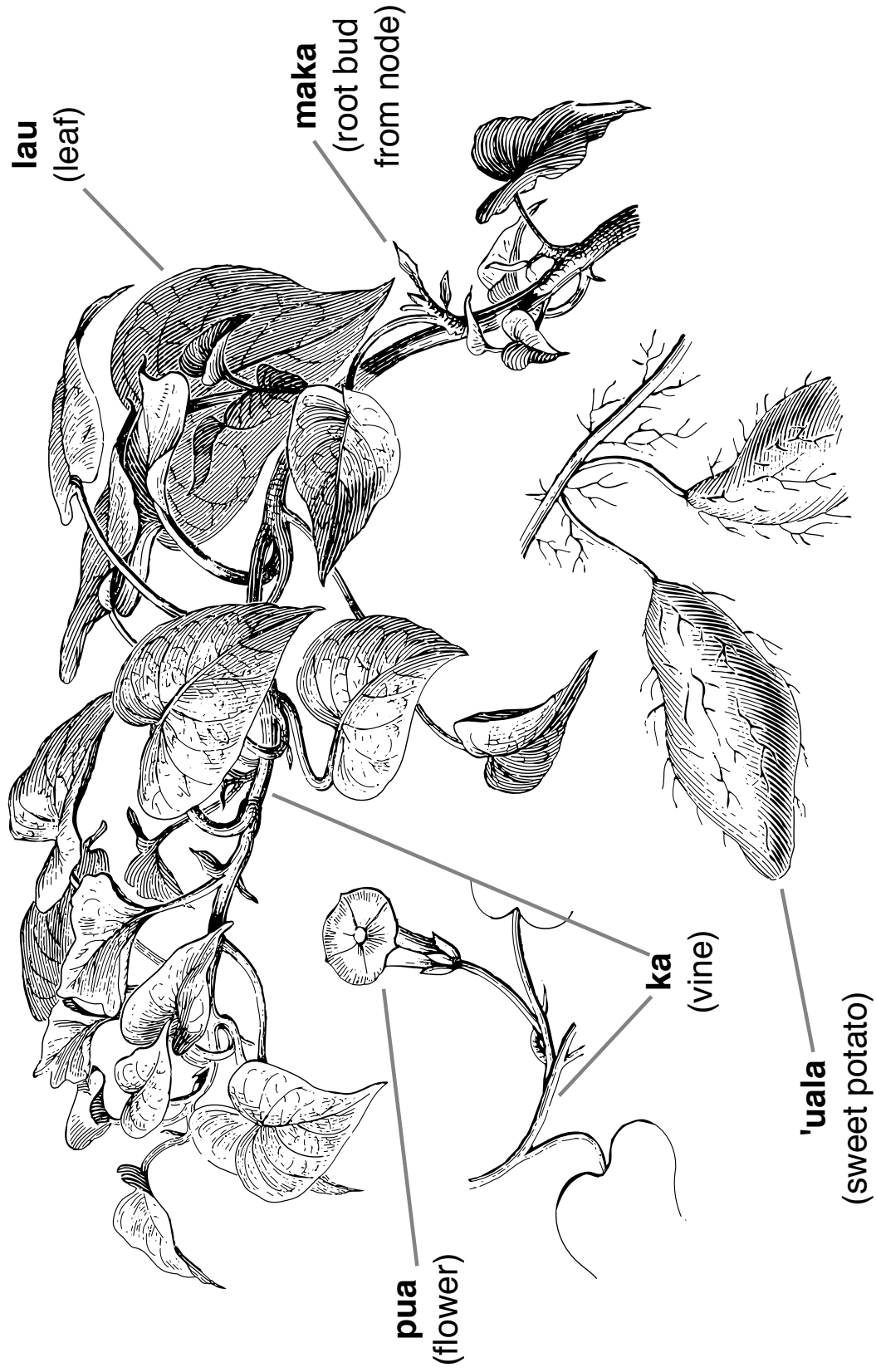
Mahi'ai - Farmer

Nutrient - A substance that provides nourishment essential for growth and the maintenance of life, such as protein, vitamins, and minerals

'Uala - Hawaiian word for sweet potato; refers to Hawaiian varieties of sweet potato; parts of the plant include the ka ('uala vine), lau (leaf), maka (root bud from node), pua (flower), 'uala (sweet potato root)

Variety - A type of plant showing similar characteristics to, and only slightly different characteristics from the species plant

Directions: Use this space to record your notes, drawings, and observations.





Edible Leaves

Directions: Fill in your answers to the questions below.

1. Describe your role in the 'uala leaf harvest community work day: _____

2. Did you like the taste of the cooked 'uala leaves? _____

3. Visit your regular grocery store or farmers' market. In the produce section, find 3 different types of edible plant leaves. Write their names below and the place where they were grown:

	Type of Plant With Edible Leaves	Where Was It Grown?
a)		
b)		
c)		

4. Describe at least 2 benefits of using Hawai'i-grown produce instead of imported produce:

5. What does ALOHA mean? _____

6. Describe at least one specific example of how you or someone else practiced ALOHA today:



Student Worksheet
THE HAWAIIAN GARDEN
Lesson 5 * 'Uala Leaf Harvest

Name

Class Date

EXTENSION: We sauteed our 'uala leaves with garlic, coconut oil, and a little salt. At home with your family, cook both of the recipes below, then in the space to the right of each recipe draw a picture of you and your family cooking the recipes and write a brief opinion piece comparing the two, and/or a narrative describing the process.

'Uala Leaf Salad

- 1 medium bunch of fresh 'uala leaves, trimmed
- 5 cups water
- 2 medium tomatoes, sliced or quartered
- 1 medium onion, minced
- 1 thumb-sized ginger, minced
- Juice of 1 lemon
- 1 Tbs. olive oil
- 3 Tbs. soy sauce

Instructions

In a small bowl, combine ginger, lemon juice, olive oil and soy sauce. Heat water in a pot, bring to a boil, add 'uala leaves and blanch for 30 seconds. Drain. Transfer to a serving dish. Pour the lemon juice mixture over the blanched 'uala leaves, add tomato slices and onions, and mix well. Serve.

Source: www.motherearthnews.com/real-food/sweet-potato-leaves-recipe-zb0z11zwar.aspx

'Uala Leaf Quinoa Soup

- 1/2 onion chopped
- 1 stick celery chopped
- 1/2 cup uncooked quinoa triple washed
- 5 cups veggie broth
- 2 cups 'uala leaves coarsely chopped
- Avocado

Instructions

In a medium sized pot sauté the onion and celery until the onion starts to turn golden. Add the veggie broth and quinoa and bring to a boil, reduce heat and simmer for 10 minutes. Add the 'uala leaves and simmer for five more minutes. Garnish with sliced avocado and enjoy.

Source: www.blog.cobrahead.com/2011/11/20/sweet-potato-leaf-quinoa-soup/



KEY TERMS AND CONCEPTS

Endangered - Species at risk of extinction

Endemic - Species that evolved in Hawai'i and are native only to Hawai'i

Exotic - Species originating outside of Hawai'i and imported by humans since 1778

Extinct - A species that has completely died out

Indigenous - Species that arrived here without human assistance; native to Hawai'i and other parts of the world

Invasive - Spreading prolifically and undesirably

Mālama - To take care of, preserve, and protect

Native - Species that either originated (evolved) or arrived here without human assistance; endemic or indigenous to Hawai'i

Polynesian-Introduced; Canoe Plants - Non-native species that were brought to Hawai'i by Polynesian settlers (for food, clothing, medicine, dyes, etc.)

Species - A group of living organisms (plants, animals, etc.) consisting of similar individuals capable of interbreeding and producing fertile offspring.

Directions: Use this space to record your notes, drawings, and observations.



My Native Hawaiian Plant

Directions: Complete the questions below during your group discussion using the Native Hawaiian Plant Profile Sheet. Write your name next to the information you will present on.

1. **Hawaiian Name:**
2. **Scientific Name (Genus and species names):**
3. **Circle: Indigenous or Endemic**
4. **Is your plant endangered?:**
5. **Additional Habitat Information (summarize):**
6. **Water Requirements & Light Conditions:**
7. **Early Hawaiian Use(s) (summarize up to 3):**
8. **Modern Use(s) (summarize up to 3):**
9. **Draw a picture of the native Hawaiian Plant you planted!**

Name
Class Date

Part 1 Directions: Label the Native and Introduced Plants diagram using the words in the word list.

- Word List**
- Endangered
 - Endemic
 - Exotic
 - Extinct
 - Indigenous
 - Introduced
 - Invasive
 - Native
 - Polynesian

Arrived in Hawai'i without human assistance or originated (evolved) in Hawai'i



Evolved here and is native only to Hawai'i



'Ōhi'a lehua
Metrosideros polymorpha

Native to Hawai'i and other parts of the world



Naupaka kahakai, Beach naupaka
Scaevola sericea

Originated outside of Hawai'i and imported by humans (intentionally or accidentally); also referred to as alien species



Brought to Hawai'i by Polynesian settlers (also known as "Canoe Plants")



Kalo, Taro
Colocasia esculenta

Brought to Hawai'i since 1778 (Western contact established via Captain James Cook)



Red ginger
Alpinia purpurata

At risk of extinction



Ka'ala Loulu
Prichardia kaalae

Completely died out



Cross-bearing Peleia
Melicope cruciata

Spreading prolifically and undesirably or harmfully



Miconia
Miconia calvescens



Native and Introduced Plants

Part 2 Directions: Fill in your answers to the questions below.

1. What is the difference between native and introduced plants? _____

2. What is the difference between endemic and indigenous native plants? _____

3. Why is it important to protect and plant native Hawaiian plants? _____

4. What does MĀLAMA mean? _____

5. Describe at least one specific example of how you or someone else practiced MĀLAMA today: _____

6. What was your favorite part about the Native Hawaiian Plants lesson? _____



KEY TERMS AND CONCEPTS

Ho'omaika'i - Grateful, to thank, to improve/correct/perfect

Kō'elepālau - Sweet potato pudding; cooked, mashed sweet potato mixed with coconut milk

Lau - Leaf; vegetative cutting or slip of the 'uala plant; used to propagate 'uala

Mahi'ai - Farmer

Node - The part of a plant stem from which one or more leaves emerge

'Uala - Hawaiian word for sweet potato; refers to Hawaiian varieties of sweet potato

Variety - A type of plant showing similar characteristics to, and only slightly different characteristics from the species plant

Directions: Use this space to record your notes, drawings, and observations.

KŌ'ELEPĀLAU RECIPE

1. Wash the 'uala and remove 'uala skins with a vegetable peeler. Cut into large chunks and steam until soft.
2. Place the cooked 'uala in the bowl and mash with a wooden pestle.
3. When mashed, add coconut milk in small amounts, mixing it in until smooth.
4. Serve on ti leaf plates and enjoy! Mmmm 'ono!



Notes, Drawings, and Observations
THE HAWAIIAN GARDEN

Name

Class Date

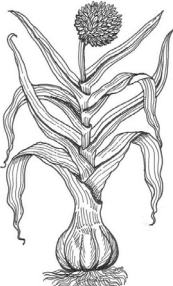



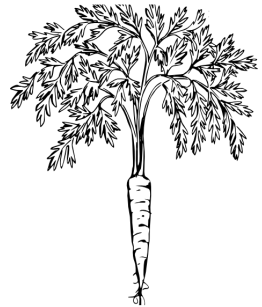

Directions: Use this space to record your notes, drawings, and observations.

Edible Roots and Stems

Directions:

Read the information below, then on page 2, color the picture of each plant and fill in the name of the plant and its storage plant part.





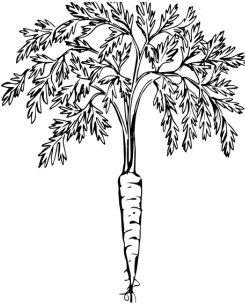

What we normally think of as roots may actually be called by a different name. Most of the edible parts of the plants shown here are actually stems! Tubers, rhizomes, corms, bulbs, and storage roots are parts of plants that all serve the same purpose in different ways. They are each a storage unit for food for the plant, which is created inside the plant by the process of photosynthesis. This food gives plants - and people! - the energy we need to grow and complete our life cycles.

STEMS		BULBS Bulbs, such as garlic and onions, are modified stems that contain in their center a vegetative growing point or flowering shoot.		CORMS Corms, such as kalo, are short, vertical, swollen underground stems that have a solid texture.
		RHIZOMES Rhizomes, such as ginger, tumeric, and kī (ti) roots, are underground stems that grow horizontally just below the soil's surface. They will continue to grow and creep along under the surface with many growing points.		STEM TUBERS Stem tubers, such as potatoes, are modified stolons (stems that grow at or just below the soil surface). They have all the parts that stems do, including nodes which are the "eyes" on a potato, where the plant's roots and shoots grow.
ROOTS		STORAGE ROOTS Storage roots are modified for storage of food or water. They include some taproots, such as carrots and beets. A taproot grows downward and forms a center from which other roots sprout laterally.		ROOT TUBERS Root tubers, such as sweet potatoes, are modified lateral roots. They do not have nodes ("eyes" like potatoes have).

Word List

Plant Names: carrot, garlic, ginger, kalo, potato, 'uala

Storage Plant Parts: bulb, corm, rhizome, root tuber, stem tuber, storage root

STEMS		Plant Name: Storage Plant Part:		Plant Name: Storage Plant Part:
		Plant Name: Storage Plant Part:		Plant Name: Storage Plant Part:
ROOTS		Plant Name: Storage Plant Part:		Plant Name: Storage Plant Part:

What does HO'OMAIKA'I mean? Describe at least one specific example of how you or someone else practiced HO'OMAIKA'I today: _____



KEY TERMS AND CONCEPTS

Ahupua'a - A common sub-division of land, usually extending from the top of the mountains (mauka) to the sea (makai) and containing the resources required for survival; a watershed

Ho'omau - To continue, to perpetuate, to persevere

Huli - Portion of the kalo that is planted (includes the hā and top 1/4 to 1/2 inch of the makua)

Kalo - Taro; a staple Hawaiian food and symbolic of the elder sibling of the Hawaiian people

Mahi'ai - Farmer

Variety - A type of plant showing similar characteristics to, and only slightly different characteristics from the species plant

Directions: Use this space to record your notes, drawings, and observations.



Notes, Drawings, and Observations
THE HAWAIIAN GARDEN

Name

Class Date

Directions: Use this space to record your notes, drawings, and observations.



REFLECTION

Directions: Fill in your answers to the questions below.

1. What do you remember most about your garden experience this school year? _____

2. What foods did you prepare and which was your favorite? _____

3. What do you like about gardening? _____

4. Why is gardening important? _____

5. Why is it important to help native Hawaiian plants? _____



Student Worksheet
THE HAWAIIAN GARDEN
Lesson 8 * Kalo Harvest

Name

Class Date

6. What are the benefits of working together as a community? _____

7. Describe the feelings you experienced while working as a community with your class. _____

8. What is the most meaningful lesson you learned from the Hawaiian Garden? _____

9. Choose one or more Hawaiian values that are especially meaningful to you and explain why:

Hawaiian Values

Aloha - Love, compassion; a way of life, connecting us to each other and all that exists

Ho'omaika'i - Grateful, to thank, to improve

Ho'omau - To continue, to perpetuate, to persevere

Kuleana - Privilege, responsibility

Laulima - Cooperation, to work together

Lokomaika'i - Kind, generous

Mālama - To take care of, preserve, protect

Pono - Excellence, wellbeing, to behave respectfully



Notes, Drawings, and Observations
THE HAWAIIAN GARDEN

Name

Class Date

Directions: Use this space to record your notes, drawings, and observations.



Notes, Drawings, and Observations
THE HAWAIIAN GARDEN

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Notes, Drawings, and Observations
THE HAWAIIAN GARDEN

Name

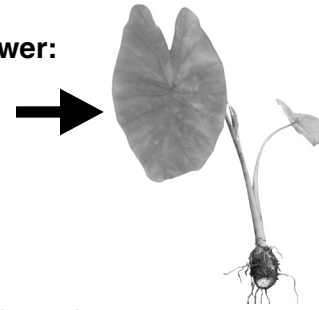
Class Date

Directions: Use this space to record your notes, drawings, and observations.

I have been at this school since grade: K 1 2 3 4 (circle one)

1. What part of the kalo is the arrow pointing to? Circle ONE answer:

- a. Kohina
- b. Lau
- c. Huli
- d. 'Oha



2. Circle the plants that were brought to Hawai'i in canoes by Polynesian voyagers:



Banana/Mai'a



Blueberries



Breadfruit/'Ulu



Carrots



Cucumber



Taro/Kalo



Coconut/Niu



Corn



Lettuce



Ti/Kī



Squash



Sweet Potato/'Uala



Tangerine

3. Draw a line to match each word to its correct definition:

- | | |
|--|---|
| a. Polynesian-Introduced
Canoe Plants | 1. Plants that evolved in Hawai'i and can only be found in Hawai'i |
| b. Ahupua'a | 2. Plants at risk of extinction |
| c. Endangered | 3. Non-native species that were brought to Hawai'i by Polynesian voyagers |
| d. Mālama | 4. To take care of, preserve, and protect |
| f. Endemic | 5. A common subdivision of land, usually extending from the top of the mountains to the sea |

4. How would you practice the Hawaiian value of ho'omau in the garden? Circle ONE answer:

- a. Continue growing native Hawaiian plants at school and home
- b. Work together with others to harvest, prepare, and cook food from the garden
- c. Give vegetables you grew as a gift to your teacher
- d. Water all the plants as fast as you can

5. What are two uses for the Kī (Ti) plant? Circle TWO answers:

- a. Garden signs
- b. Ti leaf plates
- c. To wrap food and gifts in a pū'olo (bundle)
- d. Butterfly host plant

6. Do you like gardening? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

7. Do you like eating fruits and vegetables? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

8. Do you like cooking? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

9. Do you like making compost? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

10. Do you like 'ĀINA Lessons? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

11. Do you and your family grow any food at home? Circle: Yes or No

If yes, please list the foods you grow at home: _____

12. Do you compost at home? (compost pile, worm bins, or bokashi bucket) Circle: Yes or No

13. How often do you eat fruits and vegetables? Circle ONE answer:

- a. I don't eat fruits and vegetables
- b. 1-2 times a week
- c. 3-5 times a week
- d. Every day

14. Circle the fruits and vegetables that you like to eat:

- Apple Cantaloupe Banana/Mai'a Blueberries Avocado Coconut/Niu Guava Dragonfruit
 Mango Passionfruit/Liliko'i Honeydew Rambutan Tangerine Strawberry Blackberries
 Lemon Starfruit Breadfruit/'Ulu Lychee Orange Papaya Pineapple Watermelon
 Radish Spinach Basil Beans Broccoli Squash Zucchini Sweet Potato/'Uala Corn Tomato
 Lettuce Watercress Taro/Kalo Cucumber Green Beans Asparagus Carrots Celery Kale

Other: _____

15. Describe what 'āina means to you: _____

16. List two ways that you take care of the 'āina:

- 1. _____
- 2. _____

17. Complete the following sentence:

My favorite thing about 'ĀINA In Schools Lessons is _____

INSIDE-
COVER
BLANK

OUTSIDE-
COVER
BLANK