

In this unit students will plant a vegetable garden of carrots, lettuce, and green beans, with edible parts that are the bottoms, tops, and middle of the plants. Key concepts for the unit include 'āina, the parts of plants, the job of each plant part, edible plant parts, the life cycle of plants, harvesting, and gratitude.

RECOMMENDED GRADE LEVEL

Kindergarten

This unit is easily adaptable for other grade levels.

LESSON DELIVERY

This unit consists of four 45-minute lessons to be taught at 3 to 5 week intervals (about one lesson per month) over the course of one semester. Regular garden care and observations should take place between lessons, and teachers are encouraged to use the Lesson Extensions or create their own extension activities in order to connect the gardens with other classroom learning. This unit may be delivered in either the fall or spring.

GARDEN CARE

- Teachers and students are responsible for watering and weeding their garden. Regular applications of organic nutrients (vermicast) are scheduled as part of each lesson.
- Add **Garden Monitor** to the list of classroom jobs assigned; these students should visit the garden daily to water the soil, check on the gardens, and make observations.
- Set up a shared weekly watering schedule amongst grade level teachers and/or parents and garden docents to make sure the garden receives adequate moisture.
- Please do not use synthetic chemicals (pesticides, herbicides, and/or fertilizers) in or around school and home gardens. If necessary, use "OMRI" (organic certified) products only.
- Post the **Garden Agreements** in the classroom and review them often with students.



Edible Plant Part Signs

PRE & POST UNIT SURVEYS, TAKE HOME LETTERS, & STUDENT WORKBOOKS

- Pre and Post Unit Surveys measure student progress related to content knowledge, attitudes, and behavior change related to 'ĀINA Lessons.
- Take Home Letters contain suggested questions/activities for each lesson for families to help reinforce, engage, and learn along with their child.
- Student Workbooks include Student Worksheets and Take Home Letters, available for download at www.kokuahawaiifoundation.org/aina.
- Regular student observation time in the garden is encouraged with the use of individual Garden Journals or Folders, where drawings and writings can be kept by each student, or a Class Journal where weekly garden observations can be recorded by Garden Monitors.
- Plan to review and select examples of student work to be shared with the Kōkua Hawai'i Foundation.

LESSON EXTENSIONS

Gardens offer infinite, engaging learning opportunities, and teachers are encouraged to utilize them beyond these lessons. The lesson plans include a number of suggested activities (Lesson Extensions) designed for teachers and students to make the most of the gardening experience!

NEED HELP?

Contact the Kōkua Hawai'i Foundation with any questions or comments about this unit:

- aina@kokuahawaiifoundation.org
- (808) 638-5145



THE TOPS AND BOTTOMS GARDEN

Lesson 1	Lesson 2	Lesson 3	Lesson 4
Plant Parts	Plant Life Cycle	Review and Garden Harvest	Harvest Party
SUGGESTED DELIVERY TIMES FOR FALL SEMESTER (3 to 5 weeks apart)			
September	October	November (6 weeks after Lesson 2 for green bean harvest)	December
SUGGESTED DELIVERY TIMES FOR SPRING SEMESTER (3 to 5 weeks apart)			
February	March	April (6 weeks after Lesson 2 for green bean harvest)	May
LESSON OVERVIEW			
Key Concepts <ul style="list-style-type: none"> Plant parts and their jobs Edible plant parts Garden Agreements Planting seeds 	Key Concepts <ul style="list-style-type: none"> Green bean life cycle Garden care Harvesting 	Key Concepts <ul style="list-style-type: none"> Plant part review Lettuce life cycle Garden care Harvesting 	Key Concepts <ul style="list-style-type: none"> Harvesting Gratitude Celebrate!
Introduction Discuss the parts of a tomato plant and their jobs. Play the Plant Part Game to discover the parts of plants we eat along with examples. Review the Garden Agreements.	Introduction Read the book <i>A Bean's Life</i> and act out the life cycle of a bean plant. Sing the Harvest Song if lettuce will be harvested from the garden. Discuss garden care.	Introduction Review edible plant parts by having students sort themselves into groups of the different plant types. Discuss the lettuce life cycle and proper harvesting.	Introduction Read the <i>Tops and Bottoms</i> story. Discuss the Harvest Party celebration and sing the Harvest Song. Discuss the meaning and importance of gratitude.
Activity 1: Book and Song Activity Read the <i>Vegetables, Vegetables!</i> book and discuss other fruits and vegetables that students like to eat. Sing the Plant Part Song.	Activity 1: Life Cycle Scavenger Hunt Explore the schoolyard, collecting seeds, green leaves, flowers, and brown leaves and arrange these items into a circle of life.	Activity 1: Tops and Bottoms Read the <i>Tops and Bottoms</i> book and discuss the Tops and Bottoms garden in the story and in the school garden.	Activities 1 and 2: Garden Harvest and Harvest Party Hats Harvest and wash lettuce, beans, and carrots. Cover soil with mulch. Create Harvest Party hats by drawing a garden scene and the parts of plants.
Activity 2: Garden Planting Prepare the soil and plant carrot and lettuce seeds in the Tops and Bottoms Garden. Care for the garden by watering and adding vermicast to the soil.	Activity 2: Planting and Garden Care Harvest, wash, and eat fresh lettuce leaves. Plant bean and lettuce seeds. Weed, water, and feed the garden with vermicast.	Activity 2: Harvest, Plant, Care Harvest fresh lettuce leaves and plant lettuce seeds. Weed, water, and feed the garden with vermicast. Add compost and mulch (optional).	Harvest Party Students share what they are thankful for before enjoying the garden harvest. Parents and other guests join in the celebration.
Follow Up Activities <ul style="list-style-type: none"> Daily garden care and observations Remove cover cloth when sprouts emerge (if used) Student Worksheet: Plant Parts Journaling and discussion Lesson Extensions Take Home Letter 	Follow Up Activities <ul style="list-style-type: none"> Daily garden care and observations Student Worksheet: Green Bean Life Cycle Harvest, wash, and eat fresh garden vegetables Journaling and discussion Lesson Extensions 	Follow Up Activities <ul style="list-style-type: none"> Daily garden care and observations Student Worksheet: Harvest Reflection Harvest, wash, and eat fresh garden vegetables Invite parents to the Harvest Party (Lesson 4) Journaling and discussion Lesson Extensions 	Follow Up Activities <ul style="list-style-type: none"> Continue to care for the gardens and harvest vegetables; dry and save lettuce and bean seeds Place mulch over bare soil Student Worksheet: Garden Reflection Journaling and discussion Lesson Extensions Submit examples of student work to Kōkua Hawai'i Foundation

ACADEMIC STANDARDS GUIDE: KINDERGARTEN ALIGNMENT

Common Core Standards (CCSS), Language Arts		
K.RL.10	Reading Literature: Range of Reading and Level of Text Complexity: Actively engage in group reading activities with purpose and understanding.	Lessons 3, 4
K.RI.10	Reading Informational: Range of Reading and Level of Text Complexity: Actively engage in group reading activities with purpose and understanding.	Lessons 1, 2, 3, 4
K.W.2	Writing: Text Types and Purposes: Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.	Lesson 1
K.W.3	Writing: Text Types and Purposes: Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.	Lessons 1, 2, 3, 4
K.W.8	Writing: Research to Build and Present Knowledge: With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.	Lessons 1, 2, 3, 4
K.SL.1	Speaking and Listening: Comprehension and Collaboration: Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.	Lesson 3
K.SL.2	Speaking and Listening: Comprehension and Collaboration: Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.	Lessons 1, 2, 4
K.SL.5	Speaking and Listening: Presentation of Knowledge and Ideas: Add drawings or other visual displays to descriptions as desired to provide additional detail.	Lesson 1
K.SL.6	Speaking and Listening: Presentation of Knowledge and Ideas: Speak audibly and express thoughts, feelings, and ideas clearly.	Lessons 1, 3, 4
K.L.6	Language: Vocabulary Acquisition and Use: Use words and phrases acquired through conversations, reading and being read to, and responding to texts.	Lessons 1, 2, 3, 4

(Academic Standards Guide continues on page 4)

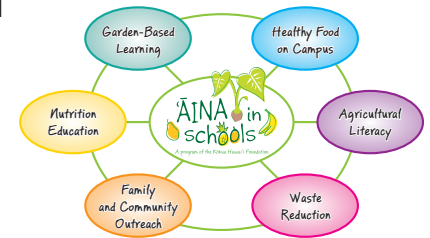
ACADEMIC STANDARDS GUIDE: KINDERGARTEN ALIGNMENT (CONTINUED)

Hawai'i Content & Performance Standards III (HCPS III)		
FA.K.1.2	How the Arts are Organized: Use developmentally appropriate art media, tools, and processes	Lessons 1, 2, 4
FA.K.3.1	How the Arts are Organized and Applied: Perform imitative movements	Lesson 2
FA.K.4.1	How the Arts are Organized: Use body, energy, space, and time to move in different ways	Lesson 2
FA.K.4.3	How the Arts Communicate: Use movement to respond to a variety of stimuli, such as observed dance, words, sounds and songs	Lesson 2
HE.K-2.1.2	Healthy Eating and Physical Activity: Explain the benefits associated with exercise	Lesson 3
HE.K-2.1.3	Healthy Eating and Physical Activity: Describe the benefits associated with a healthy diet	Lessons 1, 3, 4
HE.K-2.1.5	Personal Health and Wellness: Describe how individuals can promote and protect their own health	Lessons 1, 3, 4
HE.K-2.1.7	Personal Health and Wellness: Describe the benefits associated with personal cleanliness	Lessons 1, 2, 3, 4
HE.K-2.7.1	Advocacy Across Topic Areas: Describe ways to help others promote and protect their own health	Lesson 3

Next Generation Science Standards (NGSS)		
Disciplinary Core Ideas		
ESS3.A	Natural Resources: Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.	Lessons 1, 2, 3
Science and Engineering Practices		
Obtaining, Evaluating, and Communicating Information: Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas.		Lessons 2, 3
Analyzing and Interpreting Data: Use observations to describe patters in the natural world in order to answer scientific questions.		Lesson 4
Crosscutting Concepts		
Patterns: Patterns in the natural and human designed world can be observed and used as evidence.		Lessons 1, 2, 3, 4
Systems and System Models: Systems in the natural and designed world have parts that work together.		Lessons 1, 2, 3, 4

ABOUT 'ĀINA IN SCHOOLS

'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. In addition to encouraging the use of locally grown fruits and vegetables in school meals and snacks, the program includes standards-based nutrition, garden, and compost curricula that empower children to grow their own food, make informed food decisions, and reduce waste. 'ĀINA In Schools also provides 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.



PUBLISHING INFORMATION

The 'ĀINA In Schools curricula includes Nutrition Education, Garden-Based Learning, and Waste Reduction lessons for kindergarten through sixth grade students.

All 'ĀINA In Schools curricula and materials are property of the Kōkua Hawai'i Foundation and are distributed to trained docents and teachers for use at schools participating in the 'ĀINA In Schools program. These curricula and materials may be reproduced for individual classroom use by schools participating in the 'ĀINA In Schools program or by registered users approved by the Kōkua Hawai'i Foundation. Reproduction of these curricula and materials is not permitted by unregistered users without the express written consent of the Kōkua Hawai'i Foundation.

The registration and training process helps Kōkua Hawai'i Foundation to gather teacher feedback on the curricula and to document how many children and schools are being reached through the lessons. Visit our website to become a registered user, sign up for trainings, and gain access to all Kōkua Hawai'i Foundation curricula and resource guides. Please direct questions about the 'ĀINA In Schools program and curricula to aina@kokuahawaiifoundation.org.

MAHALO

The Kōkua Hawai'i Foundation thanks the following organizations and individuals who have assisted with the development of the 'ĀINA In Schools curriculum and materials:

- **Kōkua Hawai'i Foundation:** Kaliko Amona, Lydi Morgan Bernal, Sarah Gelb, Kim Johnson, Julius Ludovico, Summer Maunakea, Debbie Millikan, Deanna Moncrief, Kelly Perry, www.kokuahawaiifoundation.org
- **The Green House:** Betty Gearen and Tia Meer, www.thegreenhousehawaii.com
- **GrowingGreat:** Marika Bergsund and Lori Sherman, www.growinggreat.org
- **Food for Thought:** Marty Fujita, www.foodforthoughtojai.org

Special thanks to the students, teachers, and volunteers who have participated and taught lessons in previous years and provided their valuable feedback to improve them.

Mahalo nui!

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 semester. Try your best and have fun!

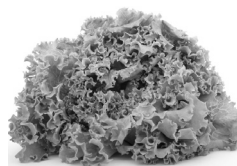
1. Draw a **circle** around the fruit:



Flower



Papaya



Lettuce

2. Draw a **circle** around what you would bury in the soil to grow a plant:



Seeds



Worms



Leaf

3. Draw a **circle** around the part of the carrot you eat most of the time:

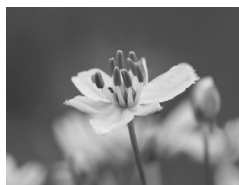


Leaves









Root

4. Draw a **circle** around the picture that best shows withering:



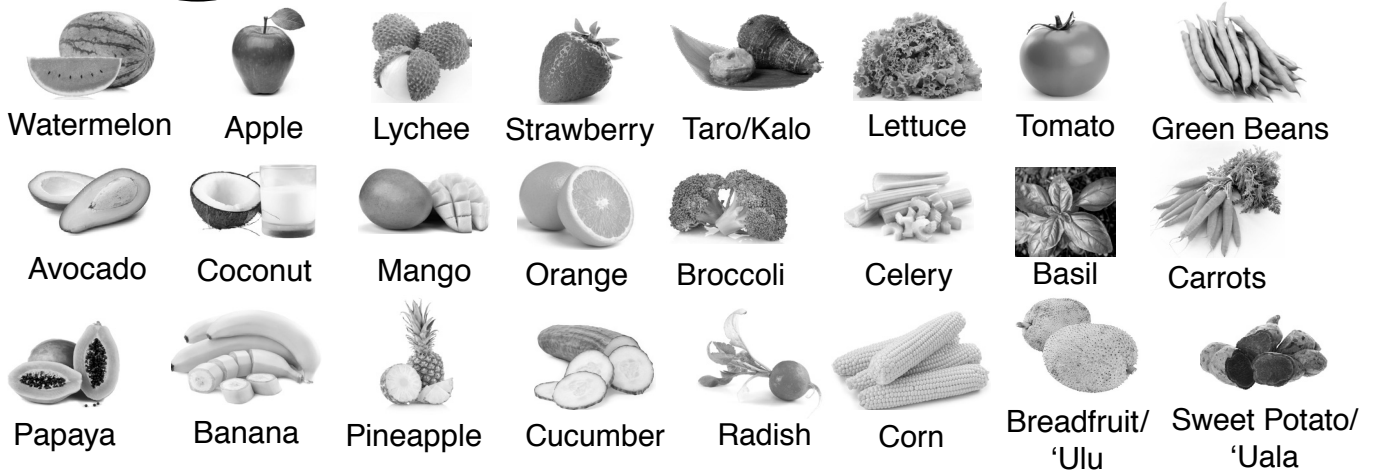
4. Do you like gardening? **Circle** ONE answer:  Yes  I don't know  No

5. Do you like eating fruits and vegetables? **Circle** ONE answer:  Yes  I don't know  No

6. Do you like cooking? **Circle** ONE answer:  Yes  I don't know  No

7. Do you like 'ĀINA Lessons? **Circle** ONE answer:  Yes  I don't know  No

8. Draw a **Circle** around all the fruits and vegetables you like to eat:



9. Draw a picture of what 'āina means to you.

Dear Parent or Caregiver:

This semester, kindergarteners will be participating in four 'ĀINA In Schools Garden Lessons. 'ĀINA In Schools, a program of Kōkua Hawai'i Foundation, 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, farm field trips, chef visits, waste reduction, and family and community outreach.

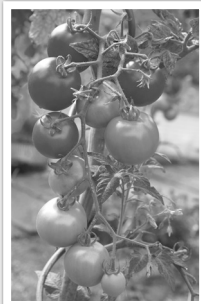
Although the lessons are delivered once a month, the students will be engaged in between lessons with regular garden activities that include watering, weeding, making observations, and spending time in the garden.

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.

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

Mahalo!

In the **Tops and Bottoms Garden** unit, students will plant a vegetable garden of carrots, lettuce, and green beans, with edible parts that are the bottoms, tops, and middle of the plants. Key concepts for the unit include 'āina, the parts of plants, the job of each plant part, edible plant parts, the life cycle of plants, harvesting, and gratitude.



Lesson 1 - Plant Parts

In this lesson, students will discuss the parts of a tomato plant and discover the important job of each plant part. They play the Plant Part Game to discover examples of different edible plant parts: roots, stems, leaves, flowers, fruits, and seeds. Students read *Vegetables, Vegetables!*, sing the Plant Part Song, and plant their Tops and Bottoms Garden by planting carrot and lettuce seeds.

Questions to discuss with your child:

- What part of the plant grows underground and takes in water and nutrients from the soil?
- What is the special job of a seed?

Suggested home activity:

- Show your child a fruit or vegetable and have them tell you which part of the plant it came from.
- Have your child describe the texture, smell, taste, and appearance of the fruit or vegetable.



Lesson 2 - Plant Life Cycle

In this lesson, students explore the plant life cycle by reading the book *A Bean's Life* and acting out the life cycle of bean plants. Outside, students will go on a Life Cycle Scavenger Hunt, finding seeds, green leaves, flowers, and brown leaves and arranging them into a circle of life. They plant bean seeds and help the garden by watering, weeding, and fertilizing with vermicast. They will harvest, wash, and eat any available fresh lettuce from the garden.



Questions to discuss with your child:

- What are the stages of the green bean life cycle?

Suggested home activity:

- Observe a bean seed germinate and sprout: In a shallow glass jar, fill with paper towels halfway. Add bean seed on top of paper towel. Drip water onto towels until moist but not soaked. Observe the bean seed daily and record or draw changes occurring. Transfer plant when four leaves appear.

Lesson 3 - Review & Garden Harvest

In this lesson, students will sort themselves into groups and review the parts of a plant that are eaten and the job of each plant part (roots, stem, leaves, flower, fruit, seeds). They will also review the life cycle of plants by discussing the lettuce plant life cycle. In the garden they will harvest, wash and eat any available lettuce and beans, plant lettuce seeds if space allows, and care for the garden by watering, weeding, and fertilizing with compost and vermicast.

Questions to discuss with your child:

- What are the jobs of each plant part?

Suggested home activity:

- Identify and make a list of the many different fruits or vegetables that your child has eaten.
- Discuss which fruits or vegetables they prefer to eat.



Lesson 4 - Harvest Party

This is the Harvest Party celebration! Students will read the *Tops and Bottoms* story by Janet Stevens, then harvest, wash and eat their garden vegetables and make Harvest Party hats.

Questions to discuss with your child:

- What types of vegetables did you harvest today?
- Which part of the harvested vegetables could be eaten?

Suggested home activity:

- Visit a farmers' market or fruit stand.
- Identify and explore other fruits and vegetables to try in the future.



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
Program



aina@kokuahawaiifoundation.org

DESCRIPTION

Students will discuss the parts of a tomato plant and discover the important job of each plant part. They will play the Plant Part Game to discover examples of different edible plant parts: Roots, stems, leaves, flowers, fruits, and seeds. Students will read the book *Vegetables, Vegetables!*, sing the Plant Part Song, and plant their Tops and Bottoms Garden by planting carrot and lettuce seeds. Bean seeds will be planted during Lesson 2.

TIME: 45 minutes

SUBJECTS: Health, Language Arts, Science, Social Studies

LEARNING OBJECTIVES

After this lesson students will be able to:

- Identify the parts of plants and understand that each plant part has a special job to do.
- Recognize which part of each plant is eaten: Roots, stems, leaves, flowers, fruits, and/or seeds.
- Understand that some plant parts grow above ground and others below.
- Plant vegetable seeds and care for their garden.



ACADEMIC STANDARDS*

CCSS, Language Arts: K.RI.10, K.W.3, K.W.8, K.SL.2, K.L.6; **HCPS III:** HE.K-2.1.7, SC.K.1.1, **NGSS:** ESS3.A, Patterns, Systems and System Models; **Lesson Extensions:** K.RI.10, K.W.2, K.SL.2, K.SL.5, K.SL.6, K.L.6, FA.K.1.2, HE.K-2.1.3, HE.K-2.1.5

*A detailed list of the Academic Standards can be found in the Unit Overview document.

LESSON OUTLINE

- I. Introduction (20 minutes)
 1. Fall Garden Review
 2. Plant Parts and Their Special Jobs
 3. Plant Part Game
 4. Group Activities Overview
- II. Group Activities (20 minutes)
 1. Book and Song Activity (10 minutes)
 2. Garden Planting (10 minutes)
- III. Closing (5 minutes)

KEY TERMS AND CONCEPTS

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

Flower - The colorful part of a plant that attracts pollinators and produces seeds

Fruit - The ripened ovary of a flowering plant, containing one or more seeds

Leaf - Part of the plant attached to the stem that collects the sun's energy

Root - The underground plant part that absorbs water and nutrients from the soil for use by the plant, holds the plant in place, and forms symbiotic relationships with soil microorganisms

Seed - A tiny plant (embryo) and a food supply to nourish its first growth

Stem - The stalk or body of a plant where water and nutrients flow between different plant parts

LESSON MATERIALS

Community Supplies:

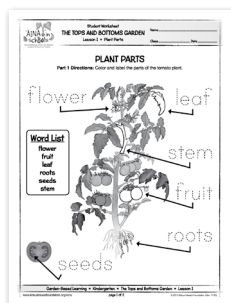
- Vermicast (about 1 cup per class)

Lesson Supplies:

- Book: *Vegetables, Vegetables!* Rookie Read-About Science book by Fay Robinson
- Book: *Tops and Bottoms* by Janet Stevens (optional, for Advance Preparation by teachers)
- Tomato Plant Sign
- Edible Plant Part Signs (7): Carrots, celery, lettuce, broccoli, tomatoes, beans, kalo
- Edible Plant Part Group Signs (6): Roots, stems, leaves, flowers, fruits, seeds
- Plant Part Song Sign
- Garden Agreements Sign
- Seeds: Rainbow carrots, lettuce mix (approx. one packet each per class)
- Water key with lanyard
- Student Workbook

Teaching Team to Provide:

- A sheet or blanket big enough for 10 to 12 students to sit on
- Optional: Live tomato plant for demonstration in a nearby location



Student Worksheet: Plant Parts

School to Provide:

- White board
- Dry-erase pens
- 12 child-safe garden tools to loosen soil
- 5-gallon bucket and 5+ plastic cups for daily watering (and/or small watering cans)
- Optional: Cover cloth (sheet, burlap, or other) to cover newly planted seeds



Edible Plant Part Signs and Group Signs

ACCOMPANYING DOCUMENTS

- ĀINA Pre-Unit Survey
- Take Home Letter
- Student Worksheet: Garden Agreements
- Student Worksheet: Plant Parts

ADVANCE PREPARATION

- Discuss lesson preparation and presentation plans with your teaching team.
- Confirm teachers have administered ĀINA Pre-Unit Surveys prior to the first lesson.
- Make copies of the Student Worksheet and Take Home Letter, one per student if not using the Student Workbook.
- Familiarize yourself with the Plant Part Song (see Sign for lyrics and tune).
- Get to know the garden! Allow students to explore their garden soil by having them dig with hands and tools and make careful observations. How does the soil feel and smell? What creatures live in our garden? In preparation for planting, loosen the soil and remove any weeds. Water the soil thoroughly one day before the lesson.
- Prepare the garden beds before class by loosening the soil, creating a low (2 inches tall) circular mound in the middle of the bed, and making a row (shallow trench, 1 inch deep) around the entire perimeter (just inside the edge) of the garden box (see Planting Diagram on page 6).
- Optional, for Classroom Teachers: Read the *Tops and Bottoms* book with students.



INTRODUCTION

20 MINUTES

“Aloha! We are... (state docents’ names) with the ‘ĀINA In Schools program. The ‘ĀINA In Schools program connects us to our food and land so we can live healthy lives and be great stewards of the environment. ‘ĀINA is an important Hawaiian word that means land and that which feeds, nourishes, and sustains us all, including food, water, and air.”

“When we come to visit you we will learn to take care of the ‘āina and to grow our own food.”

Get to know which ‘ĀINA components are being implemented at your school so you can briefly refer to them in this section.

For example, “Some other classes are exploring nutrition and food choices, some are reducing waste through composting, and some are visiting local farms to learn about where our food comes from.”



FALL GARDEN REVIEW

Briefly review the following concepts (for students that have experienced the ‘ĀINA In Schools Unit: The Butterfly Garden):

- “Last semester when we planted flowers, how did you help them grow?” By visiting and watering the garden and giving it love.
- “How did nature help the garden grow?” With sun, rain, fresh air, and healthy, living soil.
- “How did the plants help pollinators like bees and butterflies?” By giving them nectar for food.
- “How did the pollinators help the plants?” By pollinating the plants (moving pollen) and helping to create seeds!

“Today we will explore the parts of plants and plant a vegetable garden called the Tops and Bottoms Garden!”

PLANT PARTS AND THEIR SPECIAL JOBS

“Let’s discuss the parts of a plant. Every plant is made up of different parts, and each part has a special job to do so that the whole plant will grow. Do you have different body parts? Yes! What is the special job of your eyes? Your arms and hands? Every part has an important job to do.”

Use tape or magnets to attach the Tomato Plant Sign to the white board. Label each plant part as they are discussed by writing the word on the white board and connecting it with a line to the corresponding plant part on the Sign.



Tomato Plant Sign

Seed: “This is a drawing of a tomato plant. How does the life of this plant begin?” Desired answer: As a seed.

“Is a seed alive? Yes! It is alive because it grows! A seed is a baby plant; it is small and needs to be treated gently. Before we plant our seeds in the garden today let’s hold them in our hands to give them energy to grow.”

Roots: “What part of the plant grows underground?” Desired answer: The roots!

“If you were a plant, where on your body would your roots be? Your feet. What is the special job of the roots? Are they for walking? No! Roots drink water and nutrients from the soil. They also help to hold the plant in the soil and to stand up straight. The roots are the bottom of the plant; they grow underground in the soil.”

INTRODUCTION

Stem: “What part of the plant grows straight up out of the roots, above the ground?” Desired answer: The stem!

“If you were a plant, where on your body would the stem be? Your legs and torso. Can you bend a stem like you can bend your body? Stems are flexible but may break if bent too far. What is the special job of the stem? The stem acts like a straw to move water and nutrients from the roots and bring them to the other parts of the plant. The stem is the middle of the plant.”

Leaves: “What plant part grows out of the sides of the stem?” Desired answer: The leaves!

“Where on your body would the leaves be? Your arms and hands. What is the special job of the leaves? Just like our hands, the leaves ‘catch’ something. They catch the sunlight which feeds the plant and gives it energy to grow, just like your hands feed you, and your food gives you energy to grow.”

Flowers: “What part of the plant blooms and attracts pollinators like bees and butterflies?” Desired answer: The flowers!

“Where on your body might the flower be? Your head and face! What is the special job of the flower? Flowers are beautiful and filled with nectar and pollen, so that they will attract pollinators. Pollinators are creatures like bees, butterflies, and birds. Pollinators visit the flower and they help the plant make fruits and seeds!”

Fruits: “After the pollinators visit the flower, fruits begin to form. Can you point to the fruits of this tomato plant? What special plant part is found inside of the fruits?” Desired answer: The seeds!

“When a fruit with seeds inside falls to the soil, or when we plant the seeds, they begin to grow and new plants are born!”

CONTINUED

Sing the Plant Part Song with students, using the Plant Part Song Sign as a guide.

Tune: The Farmer In the Dell

Lyrics:

The seed makes a plant.
The seed makes a plant.
With soil, rain, and sunny days,
The seed makes a plant.

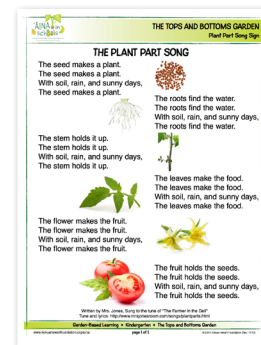
The roots find the water.
The roots find the water.
With soil, rain, and sunny days,
The roots find the water.

The stem holds it up.
The stem holds it up.
With soil, rain, and sunny days,
The stem holds it up.

The leaves make the food.
The leaves make the food.
With soil, rain, and sunny days,
The leaves make the food.

The flower makes the fruit.
The flower makes the fruit.
With soil, rain, and sunny days,
The flower makes the fruit.

The fruit holds the seeds.
The fruit holds the seeds.
With soil, rain, and sunny days,
The fruit holds the seeds.



Plant Part Song Sign

INTRODUCTION

CONTINUED

PLANT PART GAME

“Now let’s play the Plant Part Game. Did you know that we eat different parts of plants?” Hold up the Edible Plant Part Signs, one at a time. Use the table at right as a guide.



Edible Plant Part Signs

“Raise your hand if you know what plant this is. Raise your hand if you know what part of the plant we eat (root, stem, leaves, flower, fruit, or seeds). Is this edible plant part on the top, middle or bottom of the plant?”

Then show the Edible Plant Part Group Signs and discuss other examples for each edible plant part. Use the table at right as a guide.



Edible Plant Part Group Signs

Show the Kalo Edible Plant Part Sign. “Kalo (taro) is one kind of plant whose roots, stems, and leaves can all be eaten, as long as we cook them first!”



Edible Plant Part Sign: Kalo

Plant	Edible Part	Examples
Carrot	Root (bottom)	Carrots, beets, radishes, sweet potato, kalo (corm is eaten)
Celery	Stem (middle)	Celery, asparagus, kalo (stem is eaten)
Lettuce	Leaf (top/middle)	Lettuce, cabbage, parsley, basil, spinach, kalo (leaves are eaten)
Broccoli	Flower (top/middle)	Broccoli, cauliflower, artichoke, nasturtium
Tomato	Fruit (top/middle)	Tomato, banana, papaya, avocado, liliko'i, watermelon
Bean	Seed (top/middle)	Beans, peas, corn, sunflower seeds

GROUP ACTIVITIES OVERVIEW

“Today we will plant carrot and lettuce seeds in our Tops and Bottoms Garden! One group will read a book and sing a song about plant parts and the other will plant seeds in the garden, then we will switch. In our next lesson we will plant bean seeds.”

Garden Agreements

Have students take a deep breath, then repeat and discuss the Garden Agreements as listed on the Garden Agreements Sign. Spend some time during this first lesson to review with students the examples on page 2 of the sign.

- I will be SAFE
- I will be KIND
- I will have an OPEN MIND
- I will use my TIME WELL



Divide the students into two groups before going outside. Assign each group to plant either carrot or lettuce seeds.

GROUP ACTIVITIES

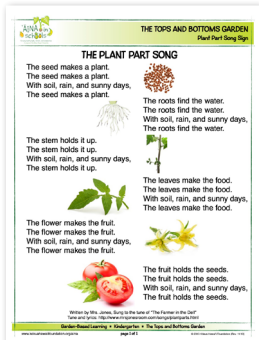
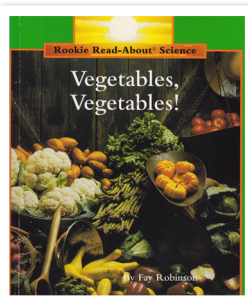
20 MINUTES

Gather in a circle around the garden. Share gratitude for the garden, our seeds, the sun, air, water, soil, and each other. Optional: Sing a garden/planting song. Note: Developing a routine protocol for entering the garden helps to cultivate a sense of respect and appreciation for this special place.

Direct students to their assigned group area. Rotate groups after 10 minutes. Regroup for closing.

BOOK AND SONG ACTIVITY (10 minutes)

Read the *Vegetables, Vegetables!* book to the students. Ask students to share examples of other fruits and vegetables they like to eat and what plant parts they represent.



Plant Part Song Sign

Using the Plant Part Song Sign as a guide, sing the Plant Part Song with students. Use hand motions to go along with the words.

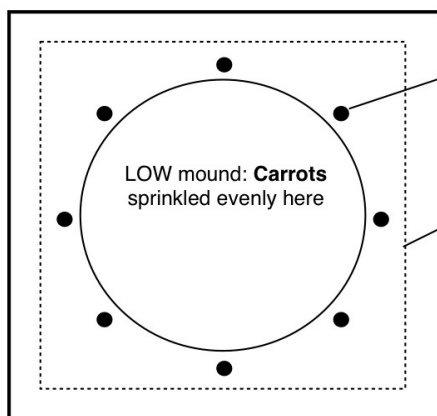
GARDEN PLANTING (10 minutes)

“Today we are planting a Tops and Bottoms Garden. If we take good care of our garden, our vegetables will grow well and we can harvest, wash, and eat them!”

- 1. Practice the Garden Agreements:** Help students to practice the Garden Agreements while they are outside in the garden.
- 2. Observe:** Allow time for students to explore the garden soil and make observations with their many senses. Encourage them to share and ask questions about what they observe.
- 3. Loosen the Soil:** Have students loosen the soil with their tools so that the new plant roots will have air and room to grow. Students may crumble soil chunks with their hands to make the soil soft and smooth. Level the surface of the soil and have students put their tools away.
- 4. Demonstrate:** Show students how to plant each type of seed before handing them out (see below).



- **Group 1, Carrots:** Demonstrate how to evenly sprinkle a small pinch of seeds over the low mound in the middle of the garden bed. Cover the seeds by “raking” them in, or by sprinkling a handful of soil over them to a depth of about 1/4 inch. Give each student a small amount of carrot seeds. Remind them to spread out the seeds so that each one has room to grow.
- **Group 2, Lettuce:** Demonstrate how to sprinkle lettuce seeds in the row closest to the edge of the garden box. Sprinkle soil on top to a depth of 1/8 to 1/4 inch. Give each student a small pinch of lettuce seeds. Remind them to spread out the seeds so that each one has room to grow.

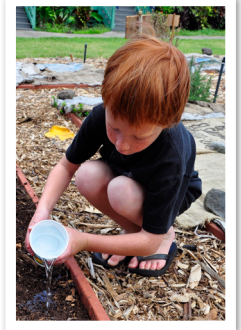


Planting Diagram

GROUP ACTIVITIES

CONTINUED

5. **Planting:** Give each child a pinch of seeds to plant. Ask students to observe the seeds closely once they receive them, and think about the tiny life inside! Have students hold the seeds in their hands to give them the energy and love they need to grow. Seeds should be placed gently in the soil (not thrown), then covered with soil (not buried). Students can say “Goodnight seeds!” as they cover the seeds with soil. Make sure the seeds are planted evenly over the entire bed and covered with a light layer of soil (about 1/4 to 1/2 inch).
6. **Vermicast:** Add about 1 cup of vermicast to the garden. If the vermicast is moist, dissolve it in water and water the soil with the nutrient-rich water. If the vermicast is dry, sprinkle it over the soil and mix it in lightly.
7. **Watering:** Have students take turns watering the soil gently with their watering can or cups (like rain, not waterfalls; allowing the soil to “sip and swallow”). Mention that young plants need lots of water and care.
8. **Cover Cloth (optional):** After the second group has planted, cover the soil and seeds with the cover cloth in order to protect them from the sun and birds. Be sure that the soil is thoroughly and adequately moist. Check daily and remove the cover cloth as soon as the seeds sprout.



CLOSING

5 MINUTES

Gather all the students in the garden. Ask them to share about their experience.

Discuss with students:

- What part of the plant grows underground and drinks water and nutrients from the soil?
- What is the special job of a seed?
- What kinds of seeds did we plant today?

“Please take good care of your garden and make sure to water and visit it every day so that the seeds will sprout and grow and the roots will have water to drink. It is very important that the garden soil stays moist and that you visit your garden!”

“In our next lesson we will plant bean seeds.” Note: Beans grow quickly and have large leaves that may shade other seedlings, preventing or delaying their growth.

“Today you learned about the different parts of the plant we eat and that each plant part has a special job to do that helps the plant grow. When you eat lunch or dinner today, look at each fruit and vegetable that is served and think about what plant part it is! Is it a root, stem, leaf, flower, fruit, or seed?”

All students must wash their hands thoroughly with soap and water after working in the garden. Demonstrate the proper hand washing method: Wet, lather, and scrub hands and wrists with soap for 15 seconds (sing the ABC’s), then rinse thoroughly. Be conscious of keeping hands clean after washing. Explain that washing our hands keeps us healthy!



FOLLOW UP GARDEN CARE

Follow Up Garden Care is the responsibility of the classroom teacher and students.

- Assign one or more **Garden Monitors** to water the garden and check for sprouts every day. Supplement as needed; it is critical that the soil stay evenly moist during sprouting. Feel the soil with your hand to a depth of about 2 to 3 inches to ensure that the soil is adequately moist.
- If the soil is covered with a cover cloth, remove it as soon as the first sprouts appear (within about 4 to 10 days). Hang to dry and store for future use.
- Remove weeds from in and around the garden bed.
- Students must wash their hands thoroughly with soap and water after working in the garden.

FOLLOW UP ACTIVITIES

Follow Up Activities are the responsibility of the classroom teacher.

- Have students complete the Garden Agreements and Plant Parts Student Worksheets.
- Have students make daily or weekly garden observations and journal entries including notes, drawings, poems, stories, etc.
- Count with students how many days go by before the first sprout appears.
- Send home Take Home Letter.

LESSON EXTENSIONS

Fruit and Vegetable Fun

(K.W.2, K.SL.5, K.SL.6, FA.K.1.2, HE.K-2.1.3, HE.K-2.1.5)

1. Have students bring to class one fruit or vegetable of their choice.
2. Have them draw their fruit or vegetable, tell which part of the plant they eat, and write a poem about it and/or a short story. Have them share their work as a class.
3. Invite parents to attend and help prepare the fruits and vegetables for a fresh salad that the class will enjoy together.
4. Discuss the health benefits associated with a healthy diet, including protection from illness, increased ability to focus and learn, etc.

The Vegetables We Eat

(K.RI.10, K.SL.2, K.L.6)

1. Read the book *The Vegetables We Eat* by Gail Gibbons with students. This book gives a clear explanation with examples of the many different types of vegetables we eat according to their edible plant part.
2. Discuss with students the interesting facts about vegetables on the last page of the book.





Student Worksheet
THE GARDEN AGREEMENTS

Name

Class Date

Directions: Draw a picture of you in the garden following the Garden Agreements.
Color the Garden Agreements on page 2.

I WILL BE SAFE

*

I WILL BE KIND

*

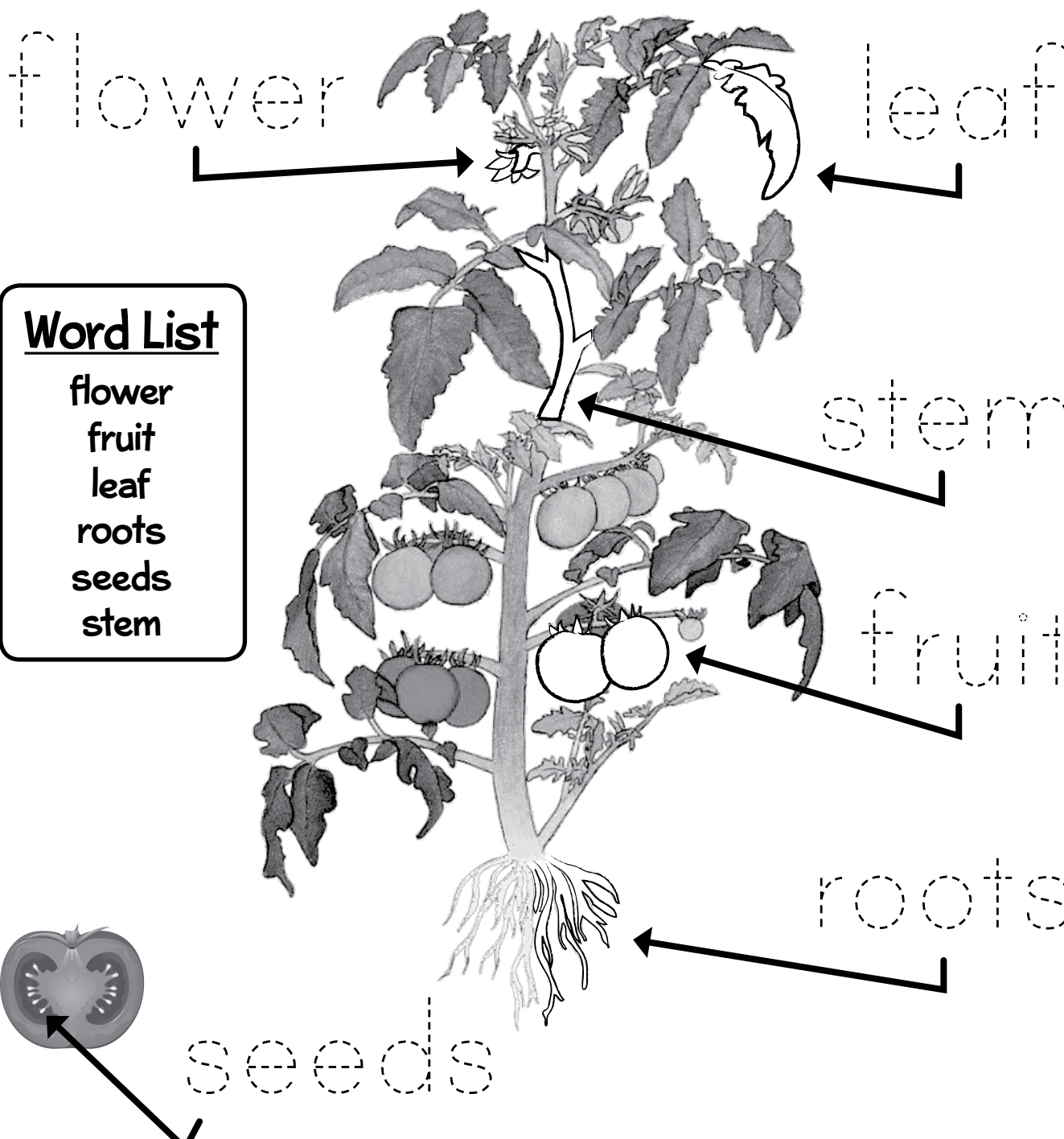
**I WILL HAVE
AN OPEN MIND**

*

**I WILL USE
MY TIME WELL**

PLANT PARTS

Part 1 Directions: Color and label the parts of the tomato plant.



Word List

- flower
- fruit
- leaf
- roots
- seeds
- stem



Student Worksheet
THE TOPS AND BOTTOMS GARDEN
Lesson 1 * Plant Parts

Name

Class Date

PLANT PARTS

Part 2 Directions: Go outside and draw a plant you see.
Color and label the parts of the plant.

Word List

- flower
- fruit
- leaf
- roots
- seeds
- stem

DESCRIPTION

Students will explore the plant life cycle by reading the book *A Bean's Life* and acting out the life cycle of bean plants. Outside, students will go on a Life Cycle Scavenger Hunt, finding seeds, green leaves, flowers, and brown leaves and arranging them into a circle of life. They will plant bean seeds and help the garden by watering, weeding, and fertilizing with vermicast, and they will harvest, wash, and eat any available fresh lettuce from the garden.

TIME: 45 minutes

SUBJECTS: Fine Arts, Language Arts, Science

LEARNING OBJECTIVES

After this lesson students will be able to:

- Discuss and act out the life cycle of a plant.
- Recognize the “real life” plant life cycle in nature.
- Properly harvest and wash their garden vegetables before eating them (as available).
- Understand that gardens need care, including water and nutrients.

ACADEMIC STANDARDS*

CCSS, Language Arts: K.W.3, K.W.8
HCPS III: FA.K.1.2, FA.K.3.1, FA.K.4.1, FA.K.4.3, HE.K-2.1.7, **NGSS:** ESS3.A, Obtaining, Evaluation, and Communicating Information, Patterns, Systems and Systems Models
Lesson Extensions: K.RI.10, K.SL.2, K.L.6, FA.K.1.2, Obtaining, Evaluating, and Communicating Information

LESSON OUTLINE

- I. Introduction (20 minutes)
 1. Plant Life Cycle
 2. Group Activities Overview
- II. Group Activities (20 minutes)
 1. Life Cycle Scavenger Hunt (10 minutes)
 2. Planting and Garden Care (10 minutes)
- III. Closing (5 minutes)



KEY TERMS AND CONCEPTS

Harvest - To gather edible crops and seeds

Life Cycle - The series of changes occurring in an organism between one developmental stage and the identical stage in the next generation

Seed - A tiny plant (embryo) and a food supply to nourish its first growth

Sprout - A small/young plant whose first leaves and stem have emerged from the ground and whose roots have begun to grow

Vermicast - Castings (poop) from composting worms; rich in soluble nutrients and microbial life (microorganisms); enhances plant growth and health

Wither - To lose freshness and moisture, to shrivel and fade

LESSON MATERIALS

Community Supplies:

- Harvest basket
- Colander
- Large bowl
- Vermicast (about 1 cup per class)

Lesson Supplies:

- Book: *A Bean's Life* by Nancy Dickmann
- Green Bean Life Cycle Sign
- Harvest Song Sign
- Garden Agreements Sign
- Seeds: Bush beans
- Student Workbooks

Teaching Team to Provide:

- Life Cycle Scavenger Hunt samples (see Advance Preparation)

School to Provide:

- White board
- Dry-erase pens
- Bucket and cups for watering

ACCOMPANYING DOCUMENTS

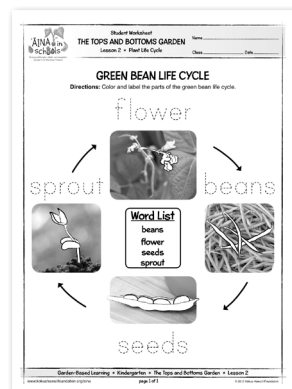
- Student Worksheet: Green Bean Life Cycle

ADVANCE PREPARATION

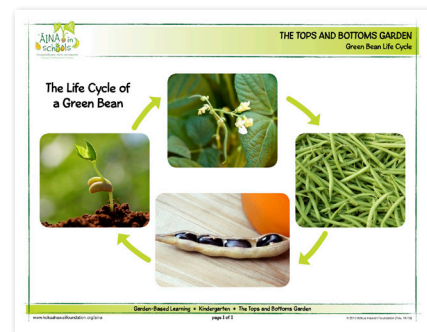
- Discuss lesson preparation and presentation plans with your teaching team.
- Make copies of the Student Worksheet, one per student if not using the Student Workbook.
- Familiarize yourself with the Harvest Song.
- Collect samples for the Life Cycle Scavenger Hunt to show students during the Introduction (seed, green leaf, flower, brown leaf).
- Check the gardens to see if there are vegetables (lettuce) ready to harvest.



Harvest Song Sign



Student Worksheet:
Green Bean Life Cycle



Green Bean Life Cycle Sign

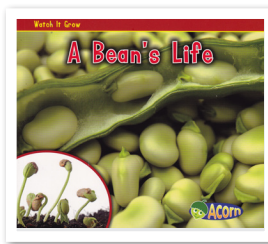
INTRODUCTION

20 MINUTES

“Remember in our last lesson we talked about the different parts of plants? Today we will learn about the life cycle of a plant. (Note: This concept will be a review for students that have experienced The Butterfly Garden Unit.) We will also care for our garden, and go on a Life Cycle Scavenger Hunt!”

PLANT LIFE CYCLE

Read the book *A Bean's Life* to students. Show the Green Bean Life Cycle Visual Aid to reinforce the concept.



Act out the bean plant life cycle with students:

- **Seed:** “How does the life of a bean plant begin? As a seed! The SEED is very small and is planted in the soil. Make your body tiny like a seed. Seeds don’t make any sound. It is very dark and still underground – close your eyes!”
- **Sprout:** “The sun and rain come and the seed wakes up and starts to SPROUT! It begins to grow by slowly pushing its little stem and leaves out of the ground, while its roots grow down into the soil.”
- **Flowers:** “The stem gets longer and stronger and many leaves grow. Little flowers begin to form and pollinators visit the flowers.” Buzz around and lightly touch their heads.
- **Beans:** “Tiny green beans begin to form where the flowers were, and they grow bigger until they are ready for HARVEST, or be gathered for food!” Pretend to harvest the vegetables. “Some that are left on the plants get even bigger because beautiful bean seeds are forming inside! We can pick them when they are dry, and plant the seeds in the soil again. When the old bean plants WITHER (shriveled and fade), new ones will grow to produce new life.”



Have students be seated. “This is called the LIFE CYCLE and cycle means circle; it goes around and around and around.”

GROUP ACTIVITIES OVERVIEW

Life Cycle Scavenger Hunt: “In the garden today we will look for examples of the plant life cycle and arrange them into a circle of life.” Show the samples: seed, green leaf, flower, brown leaf.

Garden Care: “We will also visit our garden where we may be able to harvest and eat some of our lettuce if it is ready.” If vegetables will be harvested today, sing the Harvest Song with students.

“We will also plant bean seeds and more lettuce seeds and help the garden by feeding it nutrients from worms. This is called VERMICAST and it is very healthy for plants.” Show vermicast. “What part of the plant drinks water and nutrients from the soil so that the whole plant will grow? The roots! We can help the garden by adding water and nutrients to the soil so that our vegetable plants will grow well. The garden needs our love and attention so that it will be happy and flourish! The more we give to it, the more it will give to us.”

Garden Agreements

Have students take a deep breath, then review the Garden Agreements:

- I will be SAFE
- I will be KIND
- I will have an OPEN MIND
- I will use my TIME WELL



Divide the students into two groups before going outside. “One group will go on a Life Cycle Scavenger Hunt while the other group works in the garden, then we will switch.”

GROUP ACTIVITIES

20 MINUTES

Rotate groups after 10 minutes. Regroup for closing.

LIFE CYCLE SCAVENGER HUNT (10 minutes)

Optional: Divide the students into four groups that will each find one of the life cycle items: seeds, green leaves, flowers, and brown leaves.

Lead the students on a short walk around the school yard/garden area, collecting the life cycle items from the ground (avoid picking too many parts off of plants if possible).

Gather the students and help them arrange their items into a circle on the ground (or a table), representing the life cycle of plants. Ask: "How does the life of a plant begin?" Start with the placement of the seeds together, then the green leaves representing growing sprouts, then the flowers representing mature plants, then brown leaves for withering plants, then seeds again!

Discuss the breakdown of dead leaves to form new soil with the help of garden creatures that live in the soil.

PLANTING AND GARDEN CARE

(10 minutes)

All students must wash their hands thoroughly with soap and water before harvesting. Keep the harvest basket clean by keeping it off of the ground.

1. Practice the Garden

Agreements: Help students to practice the Garden Agreements while they are outside in the garden.

- 2. Observe:** Allow time for students to use their many senses to make observations. Encourage them to share and ask questions about what they observe.



3. Harvest (if fresh lettuce leaves are available):

Sing the Harvest Song with students to remind them to hold the plant with one hand and pick with the other. Harvest fresh lettuce leaves by gently twisting off one leaf at a time using two hands (hold the plant/base of the leaf with one hand, gently twist off the leaf with the other). Harvest only healthy leaves with no slugs, slug trails, or bird droppings on them. Place the lettuce leaves in the harvest basket or colander.

- 4. Plant Beans:** Demonstrate first then give one bean seed to each student to be planted in open spaces in the garden (avoid planting in the carrot mound so carrot seedlings will not be entirely shaded by bean plants). Make a 1 inch deep hole in the soil with your finger and place a bean seed inside, then cover it with soil (one seed per hole). Bean seeds should be planted about 2 inches apart. Ask students to observe the seeds closely once they receive them and before planting, and think about the tiny life inside! Have students hold the seeds in their hands to give them the energy and love they need to grow.

- 5. Plant Lettuce:** Plant lettuce seeds in any available spaces in the garden by sprinkling them over the soil and covering with a 1/8 to 1/4 inch layer of soil.

- 6. Vermicast (second group only, if groups are harvesting):** After all harvesting is finished, add about 1 cup of vermicast to the garden. If the vermicast is moist, dissolve it in water and water the soil with the nutrient-rich water. If the vermicast is dry, sprinkle it over the soil and mix it in lightly.

- 7. Watering:** Have students take turns watering the soil gently with their watering can or cups (like rain, not waterfalls; allowing the soil to "sip and swallow").

- 8. Wash and Eat Lettuce:** Rinse and rub the leaves under running water. Students may snack on them now or take them home.

CLOSING

5 MINUTES

Gather all the students in the garden. Ask them to share about their experience.

Discuss with students:

- What are the stages of the green bean life cycle?
- How did you care for your garden today?
- What kinds of seeds did we plant today?

“Please continue to take good care of your garden and make sure to water and visit it every day! As your garden grows, think of the life cycle of each growing plant.”

All students must wash their hands thoroughly with soap and water after working in the garden.



FOLLOW UP GARDEN CARE

Follow Up Garden Care is the responsibility of the classroom teacher and students.

- Continue to have Garden Monitors and other students water and visit the garden daily.
- Remove weeds from in and around the garden bed.

- Continue to have students harvest, wash, and eat the garden vegetables (lettuce and beans) as available. Save carrots for the Harvest Party.
- Students must wash their hands thoroughly with soap and water after working in the garden.

FOLLOW UP ACTIVITIES

Follow Up Activities are the responsibility of the classroom teacher.

- Have students complete the Green Bean Life Cycle Student Worksheet.
- Have students make daily or weekly garden observations and journal entries including notes, drawings, poems, stories, etc.



LESSON EXTENSIONS

Bean Life Cycle and Plant Parts Observation

(FA.K.1.2, Obtaining, Evaluating, and Communicating Information)

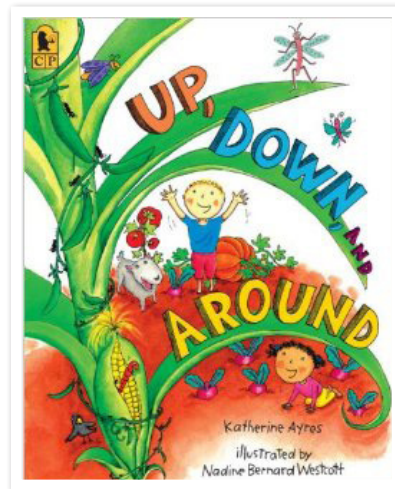
1. Divide students into groups and provide one set of supplies per group (as described below).
2. Fill glass jars with paper towels and place bean seeds inside the jars between the paper towels and the glass. Make sure the seeds do not fall to the bottom of the jar (add more towels if necessary).
3. Drip water onto the paper towels until they are moist but not soaked.
4. Have students draw their bean seeds daily as they sprout roots, a stem, and leaves!
5. Discuss the changes observed.
6. Keep the paper towels moist as the beans grow.
7. Transfer plants to the garden once their first set of leaves have formed.



Up, Down, and Around

(K.RI.10, K.SL.2, K.L.6)

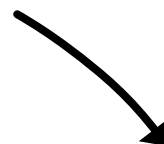
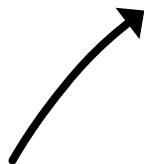
1. Read the book *Up, Down, and Around* with students. This book shows many different kinds of fruits and vegetables that grow in a garden above or below ground, and that climb all around!
2. Discuss with students the types of plants they have planted in their Tops and Bottoms garden and whether they will grow up, down, or around.



GREEN BEAN LIFE CYCLE

Directions: Color and label the parts of the green bean life cycle.

flower



sprout

beans



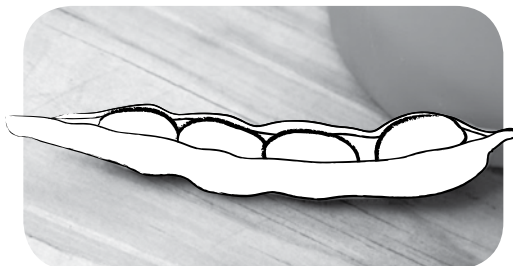
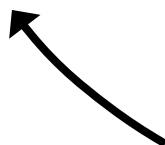
Word List

beans

flower

seeds

sprout



seeds



Student Worksheet
THE TOPS AND BOTTOMS GARDEN
Lesson 2 * Plant Life Cycle

Name

Class Date

Part 2 Directions: Draw a picture of you in the garden and write about what you are doing in your picture.

DESCRIPTION

Students will sort themselves into groups and review the parts of a plant that are eaten and the job of each plant part (roots, stem, leaves, flower, fruit, seeds). They will also review the life cycle of plants by discussing the lettuce plant life cycle. In the garden they will harvest, wash and eat any available lettuce and beans, plant lettuce seeds if space allows, and care for the garden by watering, weeding, and fertilizing with compost and vermicast.

TIME: 45 minutes

SUBJECTS: Science



LEARNING OBJECTIVES

After this lesson students will be able to:

- Explain the plant life cycle, the parts of plants, and the job of each plant part.
- Properly harvest and wash their garden vegetables before eating them.
- Care for their gardens by watering, weeding, and feeding.

ACADEMIC STANDARDS*

CCSS, Language Arts: K.RL.10, K.W.3, K.W.8, K.SL.1 **HCPS III:** HE.K-2.1.7 **NGSS:** ESS3.A, Obtaining, Evaluating, and Communicating Information, Patterns, Systems and Systems Models **Lesson Extensions:** K.RI.10, K.SL.6, K.L.6, HE.K-2.1.2, HE.K-2.1.3, HE.K-2.1.5, HE.K-2.1.7, HE.K-2.7.1

*A detailed list of the Academic Standards can be found in the Unit Overview document.

LESSON OUTLINE

- I. Introduction (15 minutes)
 1. Plant Part Review
 2. Plant Life Cycle Review
 3. Harvesting
 4. Group Activities Overview
- II. Group Activities (20 minutes)
 1. *Tops and Bottoms*
 2. Harvest, Plant, Care
- III. Closing and Snack (10 minutes)

KEY TERMS AND CONCEPTS

Bolt (Lettuce) - To grow tall quickly and produce flowers and seeds

Flower - The colorful part of a plant that attracts pollinators and produces seeds

Fruit - The part of a flowering plant that contains the seed or seeds

Harvest - To gather edible crops and seeds

Leaf - The part of a plant attached to the stem that collects the sun's energy

Life Cycle - The series of changes occurring in an organism between one developmental stage and the identical stage in the next generation

Root - The underground plant part that absorbs water and nutrients from the soil for use by the plant, and holds the plant in place

Seed - A tiny plant (embryo) and a food supply to nourish its first growth

Sprout - A small/young plant whose first leaves and stem have emerged from the ground and whose roots have begun to grow

Stem - The stalk or body of a plant where water and nutrients flow between different plant parts

LESSON MATERIALS

Community Supplies:

- Harvest basket
- Colander
- Large bowl
- Optional: Clean scissors (for cutting green beans)
- Vermicast (about 1 cup per class)

Lesson Supplies:

- Book: *Tops and Bottoms* by Janet Stevens
- Edible Plant Part Signs (7): Carrots, celery, lettuce, broccoli, tomatoes, beans, kalo
- Edible Plant Part Sorting Cards (30): 5 each of carrots, celery, lettuce, broccoli, tomatoes, beans
- Lettuce Life Cycle Sign
- Green Bean Harvest Sign
- Harvest Song Sign
- Garden Agreements Sign
- Seeds: Lettuce
- Student Workbook

Teaching Team to Provide:

- A sheet or blanket big enough for 10 to 12 students to sit on



Edible Plant Part Signs

School to Provide:

- Bucket and cups for watering and snack waste
- Optional: Compost (about 1/2 bucket per class)
- Optional: Mulch (about 1 bucket per class)

ACCOMPANYING DOCUMENTS

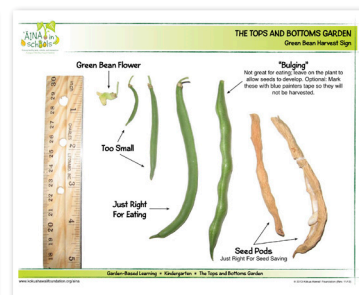
- Student Worksheet: Harvest Reflection

ADVANCE PREPARATION

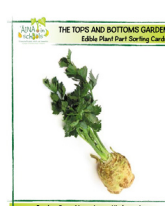
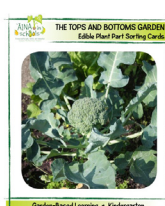
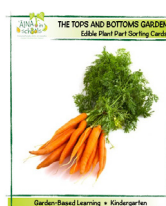
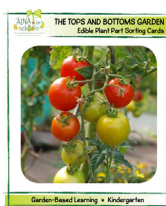
- Discuss lesson preparation and presentation plans with your teaching team.
- Make copies of the Student Worksheet, one per student if not using the Student Workbook.
- Optional: Harvest compost and mulch from the school's compost and mulch piles.
- Post the Edible Plant Part Signs in different areas around the classroom, or designate adults that will hold the cards (see Introduction: Plant Part Review).
- Have students wash their hands thoroughly with soap and water and keep their hands clean prior to the lesson so they will be ready for the garden harvest.



Lettuce Life Cycle Sign



Green Bean Harvest Sign



Edible Plant Part Sorting Cards

INTRODUCTION

15 MINUTES

Ask students how the garden is growing and what they have observed in nature.

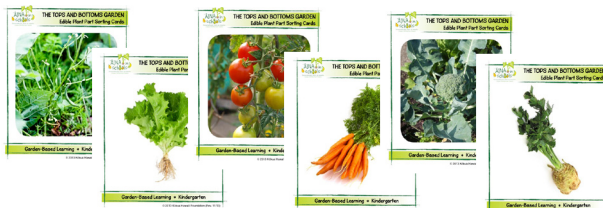
PLANT PART REVIEW

Post on the wall or have adults hold the six large Edible Plant Part Signs in different areas of the classroom (carrot, celery, lettuce, broccoli, tomato, beans).



Edible Plant Part Signs

Give one Edible Plant Part Sorting Card to each student and have them gather in groups according to their fruit or vegetable type.



Edible Plant Part Sorting Cards

Have each group discuss:

1. What type of plant is it?
2. What part of the plant do we eat?
3. What is the job of their edible plant part?



1) Plant	2) Edible Part	3) Job of the Plant Part
Carrot	ROOT	Drinking/absorbing water and nutrients from the soil; holding the plant in place
Celery	STEM	Bringing water and nutrients from the roots to the other plant parts
Lettuce	LEAF	Capturing/absorbing energy from the sun to make food for the plant
Broccoli	FLOWER	Attracting pollinators, forming seeds
Tomato	FRUIT	A yummy treat for people and animals to eat; often carries seeds to be spread or planted
Bean	SEED	Producing new plants; carrying on the life cycle for the plants

Gather the groups in a large circle and have each group take turns sharing with the whole class the name of their plant, the edible plant part, and the job of the plant part.



Show the Kalo Edible Plant Part Sign and ask who remembers the name of this plant and which parts of the plant we eat (all parts, after being cooked). Briefly discuss the importance of the kalo plant in Hawaiian culture. Kalo was widely cultivated and eaten daily in the form of poi, a very nutritious food. Many people continue to grow and eat this special plant. Mention that the 4th grade students are growing kalo on campus, if applicable.



Edible Plant Part Sign: Kalo

INTRODUCTION

PLANT LIFE CYCLE REVIEW

Collect the cards and have students be seated. Use the Lettuce Life Cycle Sign to review the LIFE CYCLE of plants with students, using lettuce as an example:

- **Seeds:** Lettuce plants begin as very tiny seeds in the soil. They receive water and warmth. Ask students if they remember the size, shape, and color of lettuce seeds they planted in their Tops and Bottoms Garden.
- **Sprouts:** The plants begin to SPROUT and grow little tender leaves and little roots. The roots grow down into the ground and drink water and nutrients from the soil. The leaves grow and collect energy from the sun and the plants grow bigger.
- **Mature Plants:** When the leaves are ready, the gardeners come along and gently HARVEST the leaves to eat. The plants grow more leaves and roots, collecting more sun, water, and nutrients.
- **Flowers:** Eventually the plants are ready to flower, and the flower stalks BOLT or reach way up into the sky. The flower stalks sway gently in the wind. When the flowers bloom, bees and butterflies come and pollinate the flowers.
- **Seeds:** Tiny seeds form and eventually fall to the soil, or are harvested and planted by the gardeners, and the life cycle begins again.



Lettuce Life Cycle Sign



CONTINUED

HARVESTING

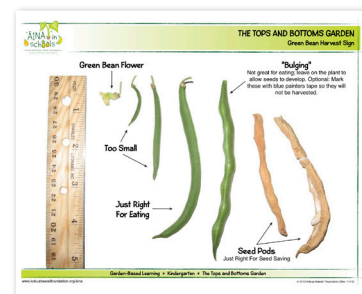
“In the garden today we will harvest lettuce and beans that are ready to be eaten!”

Sing the Harvest Song twice with students so that they will remember to use two hands while harvesting and to wash their vegetables before they are eaten.



Harvest Song Sign

Review the Green Bean Harvest Sign with students explaining which beans to look for and harvest that are just right for eating, and which to leave on the plant.



Green Bean Harvest Sign

GROUP ACTIVITIES OVERVIEW

“In the garden today one group will read a book together and the other group will plant more lettuce seeds (if space allows), harvest lettuce and green beans, and care for the garden. Then we will switch.

Garden Agreements

Have students take a deep breath, then review the Garden Agreements:

- I will be SAFE
- I will be KIND
- I will have an OPEN MIND
- I will use my TIME WELL



Divide the students into two groups before going outside.

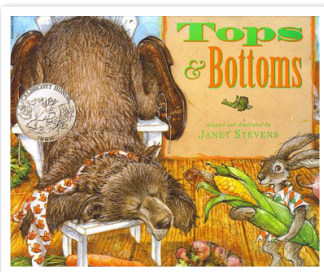
GROUP ACTIVITIES

20 MINUTES

Rotate groups after 10 minutes. Regroup for closing and snack.

TOPS AND BOTTOMS (10 minutes)

Read the *Tops and Bottoms* story to the students. This story describes how the rabbit tricked the bear by growing different parts of plants to eat. Just like the rabbit in the story, the students have planted and will harvest the bottoms, tops, and middle vegetables in their Tops and Bottoms garden.



HARVEST, PLANT, CARE (10 minutes)

All students must wash their hands thoroughly with soap and water before harvesting. Keep the harvest basket clean by keeping it off of the ground.

1. **Harvest:** Sing the Harvest Song with students to remind them to hold the plant with one hand and pick with the other. Harvest fresh lettuce leaves by gently twisting off one leaf at a time using two hands. Use two hands to gently harvest fresh green beans. Place them in the harvest basket.

2. **Plant Lettuce:** Plant lettuce seeds in any available spaces in the garden by sprinkling them over the soil and covering with a 1/8 to 1/4 inch layer of soil.
3. **Vermicast (second group only):** After all harvesting is finished, add about 1 cup of vermicast to the garden. If the vermicast is moist, dissolve it in water and water the soil with the nutrient-rich water. If the vermicast is dry, sprinkle it over the soil and mix it in lightly.
4. **Watering:** Have students take turns watering the soil gently with their watering can or cups (like rain, not waterfalls; allowing the soil to “sip and swallow”).
5. **Optional, Compost and Mulch:** Add handfuls of compost around the base of plants and gently mix it into the soil. Brush compost off of the leaves. Place mulch over the soil to preserve moisture and discourage weeds.
6. **Wash:** Place the harvested vegetables in the colander; rub and rinse thoroughly under running water. Transfer to large bowl for snack. Optional: Use clean scissors to cut green beans into small pieces for sampling.

All students must wash their hands thoroughly with soap and water after working in the garden and before eating their snack.



CLOSING AND SNACK

10 MINUTES

Gather all the students in the garden. Ask them to share about their experience.

Discuss with students:

- What types of vegetables did you harvest today?
- What plant parts did you eat from the plants you harvested today?
- What are the jobs of these plant parts?

After washing hands, enjoy the garden fresh snack with students. Have students share what they are thankful for before eating.

“In our next lesson we will have a Harvest Party! We will harvest our carrots and make Harvest Party hats. Before the Harvest Party you will make invitations for your family.” Have students place snack waste in a bucket and then add it to the school’s compost pile when finished.

FOLLOW UP GARDEN CARE

Follow Up Garden Care is the responsibility of the classroom teacher and students.

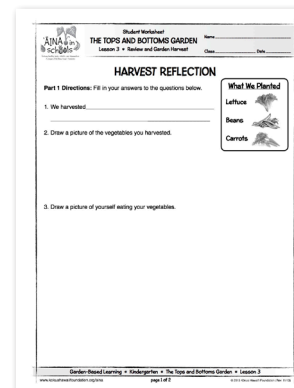
- Continue to have Garden Monitors and other students water and visit the garden daily.
- Remove weeds from in and around the garden bed.
- Continue to have students harvest, wash, and eat the garden vegetables (lettuce and beans) as available. Save carrots for the Harvest Party (Lesson 4). Students must wash their hands before harvesting. Garden produce must be washed before being eaten.
- Students must wash their hands thoroughly with soap and water after working in the garden.



FOLLOW UP ACTIVITIES

Follow Up Activities are the responsibility of the classroom teacher.

- Have students complete the Harvest Reflection Student Worksheet.
- Have students make daily or weekly garden observations and journal entries including notes, drawings, poems, stories, etc.



Student Worksheet:
Harvest Reflection

LESSON EXTENSIONS

Eat 'Um!
(K.RI.10)

1. Read the book *Eat 'Um!: Fruits & Vegetables for a Healthy Diet* by the O'ahu Head Start Program. This book is filled with fun pictures and rhymes, encouraging kids to eat their fruits and vegetables!

Harvesting For Health!

(K.SL.6, K.L.6, HE.K-2.1.2, HE.K-2.1.3, HE.K-2.1.5, HE.K-2.1.7, HE.K-2.7.1)

Discuss the following concepts with students:

1. What does 'harvest' mean?
 - To pick or gather our vegetables from the garden.
 - We always wash our hands well with soap and water before harvesting.



2. Why is it important to eat fresh vegetables?
 - They are filled with vitamins and minerals (nutrients) that our bodies need in order to work properly and to stay healthy.
 - Vitamins and minerals make our immune system strong (they keep us from getting sick), keep our skin and our eyes healthy, make our bones and muscles strong, and help us grow!
3. Are we exercising when we are in the garden? Why is exercise important?
 - In the garden we move around and stay active and fill our lungs with fresh air.
 - Exercising keeps our bodies and minds healthy and strong.
 - When we help the garden, the garden helps us!
4. Continue to have students harvest, wash, and eat their garden vegetables, and take some home to share with their families.





Student Worksheet
THE TOPS AND BOTTOMS GARDEN
Lesson 3 * Review and Garden Harvest

Name

Class Date

HARVEST REFLECTION

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

1. We harvested _____

2. Draw a picture of the vegetables you harvested.

3. Draw a picture of yourself eating your vegetables.

What We Planted

Lettuce



Beans



Carrots



Part 2 Directions: Match the vegetable to the plant part that you eat.

Beans



Root

Broccoli



Stem

Carrots



Leaf

Celery



Flower

Lettuce



Fruit

Tomatoes



Seed

DESCRIPTION

This is the Harvest Party celebration! Students will read the *Tops and Bottoms* story by Janet Stevens, then harvest, wash and eat their garden vegetables and make Harvest Party hats.

TIME: 55 minutes**

SUBJECTS: Fine Arts, Health

LEARNING OBJECTIVES

After this lesson students will be able to:

- Identify lettuce, carrot, and bean plants.
- Properly wash their hands with soap and water before harvesting and eating.
- Properly harvest and wash their garden vegetables before eating them.
- Recognize that gardens are a wonderful source of food, health, sharing, and celebration.



ACADEMIC STANDARDS*

CCSS, Language Arts:

K.RL.10, K.W.3, K.W.8, K.SL.2, K.SL.6, K.L.6

HCPS III: FA.K.1.2, HE.K-2.1.3,

HE.K-2.1.5, HE.K-2.1.7 NGSS: Patterns **Lesson**

Extensions: K.RL.10, K.RI.10, Systems and System Models, Analyzing and Interpreting Data

*A detailed list of the Academic Standards can be found in the Unit Overview document.

LESSON OUTLINE

- I. Introduction (15 minutes)
 1. Tops and Bottoms
 2. Harvest Party Overview
- II. Group Activities (30 minutes)
 1. Garden Harvest (15 minutes)
 2. Harvest Party Hats (15 minutes)
- III. Harvest Party (10 minutes)**



KEY TERMS AND CONCEPTS

Gratitude - To be grateful or give thanks

Harvest - To gather edible crops and seeds

Seed Saving - The practice of harvesting, drying, and saving seeds for future planting

**Note: This lesson is designed so that the Introduction and Group Activities take place within 45 minutes. If time permits, the Harvest Party may be extended and multiple classes and invited guests (parents, administrators, etc.) may gather to enjoy the celebration together.

LESSON MATERIALS

Community Supplies:

- Stapler and extra staples
- Harvest basket
- Colander
- Large bowl
- 2 plastic dish tubs (for washing vegetables and hands)
- 3 scrub brushes
- Soap (squeeze bottle, for washing hands)
- 2 large platters (for serving vegetables to eat)
- 2 small bowls (for salad dressing)

Lesson Supplies:

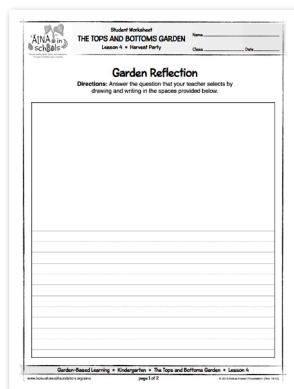
- Book: *Tops and Bottoms* by Janet Stevens
- Harvest Song Sign
- Garden Agreements Sign
- Paper for making Harvest Party hats (see Advance Preparation)
- Student Workbook

Teaching Team To Provide (with reimbursement for groceries):

- 2 sheets or blankets, each big enough for 10 to 12 students to sit on
- Optional: Salad dressing (purchase or prepare 1 large bottle per school)
- Optional, if necessary: Fresh local vegetables (1/2 head of lettuce per class, 1 bag of green beans per class, 1 bunch of cut carrots per class) from grocery store, farmers' market, or other gardens

School To Provide:

- Color markers
- Bucket and cups for watering and snack waste



Student Worksheet:
Garden Reflection

ACCOMPANYING DOCUMENTS

- Harvest Party Invitations
- Student Worksheet: Garden Reflection
- ĀINA Post-Unit Survey

ADVANCE PREPARATION

- Discuss lesson preparation and presentation plans with your teaching team.
- If parents and/or administration are being invited to attend this lesson, print, cut, and send Harvest Party Invitations home with students one week before the lesson.
- Make copies of the Student Worksheet and Take Home Letter, one per student if not using the Student Workbook.
- Prepare the Harvest Party hats (1 per student) by cutting the paper into strips, approximately 24 inches long by 1.5 inches wide.
- Arrange the sheets or blankets in a circle for snack time.
- Set up the washing station with wash bins, clean water, scrub brushes, and soap (for washing hands).
- Optional: Purchase and/or prepare any necessary groceries (salad dressing and vegetables; see Lesson Materials: Teaching Team To Provide).
- Optional: Pick some vegetables from the garden for demonstration during the Introduction (a carrot, a lettuce leaf, and a green bean).



Harvest Party Invitations

INTRODUCTION

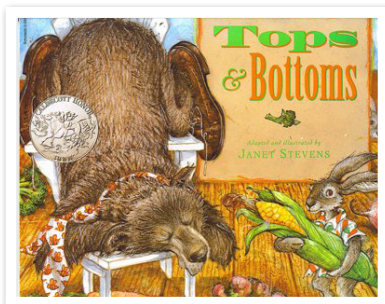
15 MINUTES

“Today is our Harvest Party! We will read a story together, then go to the garden to harvest, wash and eat our garden vegetables and make Harvest Party hats, and put the garden bed to rest.”

TOPS AND BOTTOMS

Read the *Tops and Bottoms* story to the students. This story describes how the rabbit tricked the bear by growing different parts of plants to eat. Just like the rabbit in the story, the students have planted and will harvest the bottoms, tops, and middle vegetables in their Tops and Bottoms garden.

Have a brief discussion with the students about how the rabbit tricked the bear and which edible plant parts the students will get to eat during their Harvest Party today.



HARVEST PARTY OVERVIEW

“What does HARVEST mean?” Desired answer: To gather plant parts for eating.

“In the garden today, one group will make Harvest Party hats and another group will harvest and wash lettuce, beans, and carrots, then we will switch. We will also practice SEED SAVING by harvesting bean and lettuce seeds for future planting. Afterward we will enjoy our fresh garden snack together!”

“To make your hat you can collect leaves and flowers from the garden to have stapled onto your hat, and you can draw a garden scene using markers. Be sure to draw the tops and bottoms of your garden plants.”

Sing the Harvest Song twice with students so that they will remember to use two hands while harvesting and to wash their vegetables before they are eaten.



Harvest Song Sign

“What does GRATITUDE mean?” Accept a few student answers. “Are you grateful for your garden plants? How about the garden soil, the sun, and the rain? We we harvest today be sure to express your GRATITUDE for all of these things!”

Garden Agreements

Have students take a deep breath, then review the Garden Agreements:

- I will be SAFE
- I will be KIND
- I will have an OPEN MIND
- I will use my TIME WELL

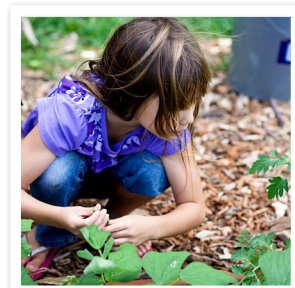


Divide the students into two groups before going outside.

GROUP ACTIVITIES

30 MINUTES

Rotate groups after 15 minutes. Regroup for the Harvest Party.



GARDEN HARVEST (15 minutes)

All students must wash their hands well with soap and water before coming to the garden to harvest. Keep the harvest basket clean by keeping it off of the

ground. Garden produce must be washed before being eaten.

Harvest:

- Gently harvest the vegetables using two hands. Sing the Harvest Song.
- Discuss the plant parts and their jobs.
- Be sure to leave enough for both groups to harvest.
- Soil-free vegetables (lettuce leaves and beans) go into the harvest basket, or students may go directly to the washing station with all harvested produce.
- Carrots should be taken to the scrubbing station after excess soil is brushed off into the garden.
- Be sure to leave enough for both groups to harvest.
- If available, harvest bean and lettuce seeds from the garden. Dry them by laying them out over newspaper in the classroom. When dry, send them home with students for planting or store in airtight containers (e.g. jars) in the refrigerator.

Wash:

- Lettuce and beans: Rub each leaf or pod with your fingers under running water or mix and wash them together in the colander.
- Carrots: In the dish tub with clean water, use the scrub brushes to remove the soil from the carrots. Scrubbing side to side helps get the soil out of the grooves of the carrot roots. Then rub and rinse the carrots under running water.
- Place clean vegetables in the large, clean bowl.

Putting the Garden Bed to Rest:

- Lay the compostable plant material over the soil as a mulch to protect the soil from the sun, or place it in the school's compost bin and cover the soil with mulch (e.g. wood chips) for protection. It is important to cover the soil, preferably with organic matter, in order to preserve moisture and soil life and discourage weeds.

HARVEST PARTY HATS (15 minutes)

- Have students put their name on the hat, then draw a garden scene (vegetables, flowers, garden creatures, etc.) to create their Harvest Party hat.
- Remind them to include all the plant parts in their drawings.
- When they finish their hat, measure the hat to fit the student's head, then staple the ends together (two prongs on the outside so as not to catch hair).
- If time and materials permit, students may collect one or two leaves or flowers from the surrounding area to have stapled to their hats.



HARVEST PARTY

10 MINUTES

Have the students wash their hands well with soap and water. Optional: Use the plastic dish tubs with clean water and soap to create a hand washing station near the garden.

If parents and/or staff attend, consider the following options for engagement:

- Place lesson materials on display (e.g. Signs).
- Have students present about what they have learned from The Tops and Bottoms Garden.
- Have students take parents on tours of the garden.
- Sing the Harvest Song, the Plant Part Song, and other garden songs together.

Have the students be seated on the sheets or blankets in a circle near the garden. Ask for students and adults to share about their experience.

Discuss with students:

- What types of vegetables did you HARVEST today?
- Do we eat the top, middle, or bottom of each of these plants?
- Invite students and adults to express their GRATITUDE before eating.

Arrange the garden vegetables on the food platters and fill the bowls with dressing (optional). Students can choose the vegetables they like to eat and dip them in salad dressing. No double dipping!

“Today we had a wonderful celebration where we got to eat the delicious food you grew in your garden. Are you excited to take some of your vegetables home to your family? Are you excited to eat more vegetables? Would you like to grow more of the food that you eat every day? You can! Let’s give ourselves a round of applause for a job well done! Let’s give a round of applause for our garden!” If there is leftover garden produce you may divide it among the students to take home or share with other classes and school staff.

Have students place snack waste in a bucket and then add it to the school’s compost pile when finished.



FOLLOW UP GARDEN CARE

Follow Up Garden Care is the responsibility of the classroom teacher and students.

- This is the final lesson of the semester so it is time to put the garden to rest. Use mulch materials to cover the soil, protecting it from the sun and discouraging weeds.
- Continue to have your students water and visit the garden at least once a week to help keep the soil alive and to harvest any remaining produce and

seeds. Students must wash their hands before harvesting. Garden produce must be washed before being eaten.

- Harvest, dry, and save bean and lettuce seeds from the garden. Keep them for future garden plantings or send them home with students to plant gardens with their families.
- Students must wash their hands thoroughly with soap and water after working in the garden.

FOLLOW UP ACTIVITIES

Follow Up Activities are the responsibility of the classroom teacher.

- Finish/embellish the Harvest Party hats if desired.
- Review this semester's garden experience with students, including the key concepts for the unit, which are 'āina, the parts of plants, the job of each plant part, and the life cycle of plants.
- Have students complete the Garden Reflection Student Worksheet.
- Have students create a final journal entry about their garden experience this semester. Have them share their work with the class.
- Administer the 'ĀINA Post Unit Survey immediately following the final lesson and review.

- Save and submit examples of student work to Kōkua Hawai'i Foundation.

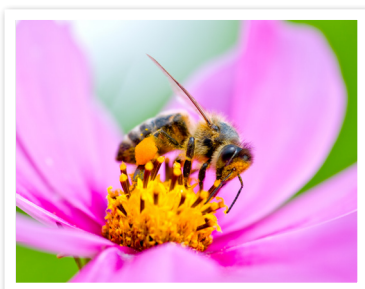


LESSON EXTENSIONS

From Seed To Plant

(K.RI.10, SC.K.1.1, NGSS: Systems and Systems Models)

1. Read *From Seed To Plant* by Gail Gibbons with students. This book talks about the plant life cycle, pollination, flower parts, and how seeds are dispersed.
2. The pollination information will be a great reminder and review for students that experienced The Butterfly Garden lessons during the fall semester.
3. Do the planting project outlined at the end of the book that will allow students to watch bean seeds sprout inside a glass jar, then plant them in a pot or in the garden. Have students observe, draw, and describe the plants as they grow.
4. Discuss with students the interesting facts about plants on the last page of the book.



The Tiny Seed

(K.RL.10, NGSS: Analyzing and Interpreting Data)

1. Read *The Tiny Seed* by Eric Carle with students. This book describes the life, "adventures", and perseverance of a tiny seed as it travels on the wind then grows in the soil to become a flower.
2. Explore the schoolyard with students to find different types of seeds and tiny sprouts. Imagine what it takes for a small plant or large tree to grow to maturity!
3. Create a seed collection for the class by having students bring seeds that they find. Have students observe the different sizes, colors, textures, and more and group/classify the seeds according to their attributes.





You're invited to our

GARDEN HARVEST PARTY!

Date:

Time:

Place:

Please join us as we celebrate and enjoy
our bountiful garden harvest!

www.kokuahawaiiifoundation.org/aina



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Student Worksheet
THE TOPS AND BOTTOMS GARDEN
Lesson 4 * Harvest Party

Name

Class Date

Garden Reflection

Directions: Answer the question that your teacher selects by drawing and writing in the spaces provided below.

A large rectangular box containing a drawing area at the top and several sets of primary-ruled writing lines (solid top and bottom lines with a dashed midline) for text entry.



For Teachers: Choose one of the following opinion questions for students, or create your own, regarding their gardening experience this semester.

**Do you like having a garden?
List three reasons why.**

**What did you enjoy most
about the garden?**

**What other types of plants would you
like to grow in the garden?**

**What is your favorite kind of
pollinator?**

**What is your favorite kind of garden
creature that lives in the soil?**

**What is your favorite kind of
vegetable to eat? What edible plant
part is it?**

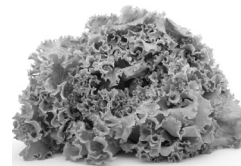
1. Draw a **circle** around the fruit:



Flower



Papaya



Lettuce

2. Draw a **circle** around what you would bury in the soil to grow a plant:



Seeds



Worms



Leaf

3. Draw a **circle** around the part of the carrot you eat most of the time:

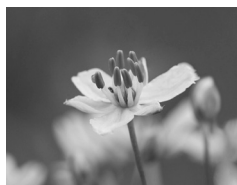


Leaves









Root

4. Draw a **circle** around the picture that best shows withering:



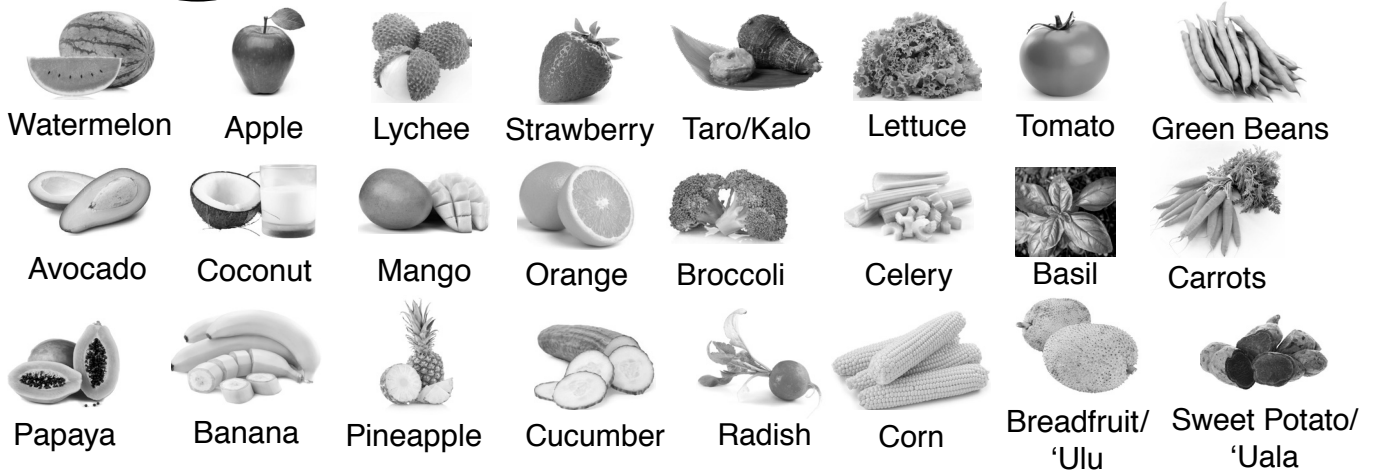
4. Do you like gardening? **Circle** ONE answer:  Yes  I don't know  No

5. Do you like eating fruits and vegetables? **Circle** ONE answer:  Yes  I don't know  No

6. Do you like cooking? **Circle** ONE answer:  Yes  I don't know  No

7. Do you like 'ĀINA Lessons? **Circle** ONE answer:  Yes  I don't know  No

8. Draw a **Circle** around all the fruits and vegetables you like to eat:



9. Draw a picture of what 'āina means to you.