

DESCRIPTION

Students will further define the concept of close to the source foods and extend the definition to include locally grown foods. Students will discuss the ahupua'a system as an example of a sustainable food system and will explore and compare various modern day food systems by mapping the journey of two bananas. Students will evaluate the food miles, environmental and nutritional impacts of imported versus locally grown foods and discuss the benefits of eating close to the source foods grown in Hawai'i.

TIME: 45 minutes

SUBJECTS: Health, Science, Social Studies

LEARNING OBJECTIVES

After this lesson students will be able to:

- Recognize the ahupua'a system as a sustainable food system that fostered environmental stewardship.
- Evaluate the environmental impacts of different modern day food systems.
- Identify the nutritional benefits of eating locally grown foods.
- Describe the interdependent relationships between food systems, health, and the environment.

ACADEMIC STANDARDS

HE.6-8.1.9, HE.6-8.6.1, SC.6.6.3

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

LESSON OUTLINE

- I. Introduction (2 minutes)
- II. The Ahupua'a System (8 minutes)
 - Natural Resources & Environmental Stewardship
- III. Banana Skit (8 minutes)
- IV. Modern Day Food Systems (12 minutes)
 - Food Systems Mapping with Picture Cards
- V. Comparing Food Systems (5 minutes)
 - Comparing Food Systems Student Worksheet
- VI. Evaluating Food Choices (5 minutes), optional
 - The ĀINA Score Student Worksheet
- VII. Close to the Source Snack & Gifts (3 minutes)
 - Imported and Locally Grown Bananas
 - Reusable Gift, optional
- VIII. Closing (2 minutes)



KEY TERMS AND CONCEPTS

Ahupua'a – A traditional Hawaiian division of land; typically pie shaped, extending from mountains to the sea, following the contours of the watershed

Distribution Center – A place that collects food from farmers and manufacturers and sells it to retail food outlets

Environment – The surroundings in which a person, animal or plant live

Farm – An area of water or land dedicated to raising food

Food Miles – The distance food travels from where it is grown to where it is finally eaten

Loss of Nutrients – Decreased nutritional value on a food due to exposure to light, heat, air, or time

Natural Resources – Materials that come from nature, such as water, minerals, trees and plants

Packaging – The material in which food is contained, displayed, transported or sold

Pollution – The introduction of harmful substances into the environment

Processing Plant – Place where food is processed, packaged, and/or made into new foods

Stewardship – To take care of something; to preserve and protect the environment and use natural resources sustainably

LESSON MATERIALS

Core Supplies:

- 'ĀINA In Schools apron with name tag
- Kōkua Hawai'i Foundation cloth bag
- Laminated 'ĀINA Food Guide Poster
- Copy of 'ĀINA In Schools Student Workbook
- Knife (plastic lettuce knife)*
- Cutting board
- Non-latex gloves
- Napkins
- Garbage/compost bag

Lesson Supplies:

- Vocabulary Cards (5)
- Ahupua'a Poster (available at kamehamehapublishing.org)
- Banana Skit Script Sign (3)
- Imported Banana Sign (1)
- Local Banana Sign (1)
- Food System Mapping Cards (25):
Farm, Farm Truck, Truck (3), Processing Plant, Packaging (2), Boat, Plane, Distribution Center, Grocery Store, Farmers' Market, Car, Bike, Home, Pollution (6), Loss of Nutrients, Plastic Bag, Reusable Bag



Food System
Mapping Card

ACCOMPANYING DOCUMENTS

- Student Worksheet: Comparing Food Systems
- Student Worksheet: The 'ĀINA Score
- Take Home Letter: Banana Sorbet Recipe
- Family Activity: Plastic Free Hawai'i

ADVANCE PREPARATION

- Lead docent to contact teachers to confirm date/time of the lessons.
- Review lesson content, roles and shopping needs with docent team.
- Shop for snack ingredients and review materials needed for lesson.

Teaching Team to Provide:

- Serving tray (or use top of bin as tray)
- Snack ingredients: local and imported bananas
- 1 imported banana and 1 local banana to use as props
- Clothesline/clothespins, magnets, or tape for Food Systems Mapping activity.

*Please do not bring knives on campus. The only knives allowed are those that are plastic and very well attended by an adult.

Banana Preparation

Please wash bananas. Use a marker to draw a line down the length of the imported bananas. Both types of banana will be cut into 1"-2" lengths with the peel left on (see below for approximate quantities). Serve students one section of each type of banana on a napkin.



INGREDIENT QUANTITIES NEEDED

How much to buy	Up to 20 students	Up to 30 students	Up to 40 students
Local Apple Bananas (Short)	7	11	14
Imported Bananas (Long)	4	6	8

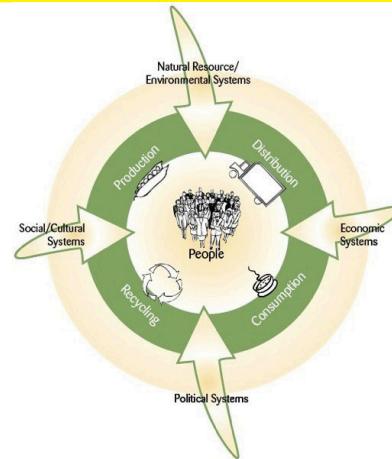
BACKGROUND INFORMATION

Hawai'i's children suffer from obesity rates that in certain communities are double the US average rates of obesity provided by the Center for Disease Control and Prevention. Obesity in childhood is a strong predictor of obesity in adulthood, and is also strongly associated with serious health problems such as diabetes, kidney disease, hypertension, and cardiovascular disease.

Hawai'i's environmental health is also at risk. Agriculture in Hawai'i has undergone a dramatic transformation over the past twenty years. In the face of rising fossil fuel costs and shipping's contributions to global climate change, almost 90% of Hawai'i's food is still imported. The concept of "**Food Miles**" is the estimated distance food travels from farm to plate. Most food travels from the farm to distributor to store to consumer via ship, trains, trucks, and planes increasing emissions of carbon dioxide and greenhouse gases from fossil fuel based transport.



As an island state, we should also be very concerned about how much waste we are producing because of our food choices and where it will go. Nowhere should the lessons of sustainability be more obvious or more necessary than on an island.



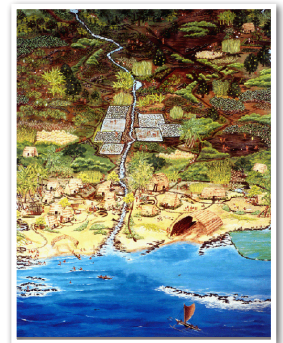
Food system diagram from the 2005 San Francisco Collaborative Food System Assessment by the San Francisco Food Alliance.

Food Systems

"The food system spans the activities, people, and resources involved in getting food from field to plate, from agriculture through nutrition and beyond. Along the way, it intersects with aspects of public health, culture, society, policy, and the environment." (From Johns Hopkins Center for a Livable Future's Food System Primer.)

The ahupua'a system

was traditionally used by Hawaiians to create and maintain a sustainable community by sharing food and other resources and working within the natural rhythms of the environment. Within this system, Hawaiians were able to live off the abundance of the land while respecting and preserving their natural environment.



Many **modern day food systems** rely upon foods grown and produced unsustainably that are imported from far away places. Fortunately, there is a growing sustainable food movement in Hawai'i, the US, and worldwide. This multi-faceted movement works to ensure that all people have access to healthy, culturally appropriate foods that are grown and

BACKGROUND INFORMATION

CONTINUED

distributed in ways that give back to the environment, save energy, and protect biodiversity. The ahupua'a system and as well as other global ancestral traditions can help to inform the ways we grow and distribute food today.

Schools can play an important role in addressing childhood health and our food system by helping children learn to make healthy choices early in life that they can carry with them to adulthood. By reconnecting children to the land through gardening, nutrition lessons, and field trips to modern and ancestral farms, we can also instill in them an appreciation for farmers and the land and natural resources that sustain them. Purchasing locally grown foods and encouraging students to eat locally can improve their health and the health of the environment.

In addition to knowing where our food comes from, it is also important to know how our food is grown. When shopping for fruits and vegetables it is helpful to know which types of produce are more likely to be exposed to pesticides since pesticides can have an impact on both our health and that of the environment. The Environmental Working Group's "Dirty Dozen" is a list of most likely contaminated fruits and vegetables to be aware of. The "Clean 15" is a list of fruits and vegetables that are among the least likely to be contaminated by pesticides. In 2020, these were:

The Dirty Dozen: Strawberries, Spinach, Kale, Nectarines, Apples, Grapes, Peaches, Cherries, Pears, Tomatoes, Celery, Potatoes

The Clean 15: Avocados, Sweet Corn*, Pineapples, Onions, Papayas*, Sweet peas (frozen), Eggplant, Asparagus, Cauliflower, Cantaloupes, Broccoli, Mushrooms, Cabbage, Honeydew Melons, Kiwis

* "A small amount of the sweet corn, papaya and summer squash sold in the United States is produced from GE seedstock. Buy organic varieties of these crops if you want to avoid GE produce."

-Environmental Working Group

Other considerations to make when choosing foods are whether they were grown organically and whether foods have been genetically modified. **Organic farming** uses nature-based techniques to maintain soil fertility and excludes or strictly limits the use of manufactured inputs such as pesticides, fertilizers, and genetically modified organisms. **Genetically modified foods**, also known as **GMO's**, are often grown with more chemical pesticides and have not been proven safe in long-term human studies.

References:

- "Ahupua'a": kumukahi.org/units/ka_honua/onaepuni/ahupuaa
 "Chemical Pesticides and Human Health: The Urgent Need for a New Concept in Agriculture": doi.org/10.3389/fpubh.2016.00148
 "Food System Primer": foodsystemprimer.org
 "GE Food and Your Health": centerforfoodsafety.org/issues/311/ge-foods/ge-food-and-your-health
 "Hawai'i's Food Security and Food Self-Sufficiency Strategy": files.hawaii.gov/dbedt/op/spb/INCREASED_FOOD_SECURITY_AND_FOOD_SELF_SUFFICIENCY_STRATEGY.pdf
 "Shopper's Guide to Pesticides in Produce": ewg.org/foodnews/



INTRODUCTION

2 MINUTES

"Hello again, we are..." State docent names.

"Do you remember our last lesson? As Label Detectives, we learned to look for clues on the ingredients list of food labels to figure out how close to the source a food is. We also talked about red flag ingredients."



"Raise your hand if you liked the close to the source snack from our last lesson: whole grain crackers with hummus." Wait for a show of hands.

"Good! I'm so glad you enjoyed it. It was a close to the source snack because the cracker was made of whole grains with no parts taken away."

"Today's lesson will incorporate what you've learned so far about close to the source foods and how your food choices affect not only your health but your environment too. We can keep our bodies healthy and also help to protect our environment by choosing close to the source foods that are grown here in Hawai'i."

"Let's begin by discussing how Hawaiians have lived sustainably in these islands for thousands of years!"

THE AHUPUA'A SYSTEM

8 MINUTES

"In traditional Hawaiian culture, there have been ways of ensuring that people lived in a harmonious relationship with their ENVIRONMENT: the land, its fresh water, and the ocean."

"Hawaiians traditionally have divided the islands into land districts often shaped like triangular pie slices called AHUPUA'A. Most ahupua'a cover three main regions: the mountains and valleys, the lowlands, and the shorelines and reefs. This system was designed to allow each community equal access to the limited NATURAL RESOURCES of the islands."

"Who can give me some examples of NATURAL RESOURCES that Hawaiians have traditionally used?" Accept three or four responses.

Desired answers: Water, food, air. Some other responses might include food, fish, drinking water, bananas, coconuts, etc.

DOCENT NOTES

- Refer to the Ahupua'a poster throughout the lesson. Hang it on the board if possible.
- Hold up vocabulary cards when each Key Word is explained.



Ahupua'a Poster

THE AHUPUA'A SYSTEM

CONTINUED

"Before ships and planes started bringing food to the islands, Hawaiians depended on the land and the ocean to provide them with food and shelter. They needed the NATURAL RESOURCES from all three regions on the island."

Ask the students to think about what kinds of NATURAL RESOURCES may be found in each of the three regions of the ahupua'a:

Mountains & Valleys

- Trees for canoe building and house parts
- Wild banana trees

Lowlands

- Farmland to grow taro, sweet potato, bananas, etc.
- Fresh water streams for drinking and watering crops
- Ti leaves for wrapping food and making clothes

Shores and Reefs

- Fish, shellfish, lobster, crab, 'opihi
- Salt, seaweed/limu

"There were no stores and restaurants for the people to obtain the items they needed, so they shared resources. The ahupua'a system allowed for the sharing of all resources within a community."

"There was a self-sustaining interrelationship between the land ('āina), ocean (kai), and the people. When it rained, water



filled the streams which flowed down the mountain and was diverted into lo'i kalo (taro patches). Water leaving the lo'i returned to the main stream which then flowed into the lowland crops and into fishponds. Nutrients from freshwater fish upstream as well as from plants and animals supported the fish in the fishponds, which was an important source of protein for the people."

"The foods they ate were very close to the source because they were fresh, whole and minimally processed and did not have to travel far before they

were eaten. In addition, if foods had to be transported they were protected by other plants such as ti leaves, not cardboard or glass containers."

"Early Hawaiians worked hard to protect their natural resources such as water and the land that produced their food, and they enjoyed the food that protected their bodies from illness and disease. It was a harmonious relationship! They took good care of their ENVIRONMENT."



"ENVIRONMENTAL STEWARDSHIP was necessary for survival. Who knows what ENVIRONMENTAL STEWARDSHIP means?" Accept a few answers.

"STEWARDSHIP means to take care of something and ENVIRONMENTAL STEWARDSHIP means to take care of the ENVIRONMENT, or the surroundings in which you live."

"Hawaiians relied on their ahupua'a system because that is all they had and it worked very well for them. Today, people have many different choices and options for finding what they need. There are many grocery stores from which we buy our food."

"Our islands are in the middle of the Pacific Ocean so how do you think the grocery stores get the food that they sell to us?"

Desired answers: by boat/ship/shipping container, airplane, etc.

"Right! There are also farmers who grow food in Hawai'i and then sell it to us at farmers' markets and grocery stores, or we can grow some food in our own gardens."

"Raise your hand if you have a garden at home? What do you grow in your garden?" Accept a couple of answers.

BANANA SKIT

8 MINUTES

"Today we are going to talk about how our food gets to our plate if we don't grow it ourselves, like Hawaiians traditionally did, and what effects that has on our environment and our health. To begin, we need two volunteers who will share with us a tale of two bananas."

Call upon two volunteers and have them use the Banana Skit Script Sign to read the story. Have the volunteers hold an actual imported banana and local

apple banana (optionally decorated in costume and "make-up" with markers) or use the printed visual aids of the two banana characters.

Remind students to be respectful of all cultures and not use stereotypical accents when performing the skit.

**See Additional Resources for a link to Honolulu Theatre for Youth's production of this skit.*



"A TALE OF TWO BANANAS" SCRIPT

NARRATOR: (In a neutral voice) *"It was midnight on the kitchen counter and the house was completely quiet when suddenly the silence was broken..."*

LANI: (In a peppy, little girl voice) *"Ah, excuse me, my name is Lani Local Banana and I couldn't help but notice you have a sticker on you that says you're imported from Ecuador. Wow!! How did you get here?"*

IGGY: (In a melancholic, tired voice) *"Oh, I am pleased to meet you, Lani! My name is Iggy Imported Banana and how I got here is a long story. Are you sure you really want to hear it?"*

LANI: *"Oh yes, I really do!"*

IGGY: *"Well, it all began weeks ago on my beautiful banana plantation in Ecuador. I was hanging out with my bunch and life was good. We were growing very nicely with all the sun and rain we needed."*

"Then one day, the farmer came along with his big machete, and cut us down when we were still GREEN. Then he threw us into his truck with many other green bunches of bananas!"

LANI: *"Oh my goodness! Poor Iggy!"*

IGGY: *"So then we were bumped along a dusty dirt road for a very long time until we came to this big building. And there they threw us into cardboard boxes and then put our boxes into big containers and into an even bigger truck. They shut the doors on us and it was all dark and very stuffy."*

"Again we traveled for a long time until we came to the port. Then our container was lifted onto a very big boat and for many days we were on the sea."

"Up and down, side to side. Oh it was not a good feeling at all, I can tell you that!"

"Then finally we arrived here in Hawai'i. We were moved off of the boat onto another truck and taken to a distribution center. This is where they, they"

LANI: *"They what?"*

IGGY: *"You will not believe this Lani, but they put us in a room and they sprayed us with ethylene to ripen us. And we started to turn from green to yellow. Can you imagine that?!"*

"After that I went on one more truck that took me to the grocery store, where this nice family bought me. Then they put me in a plastic bag and brought me home in their car....and that's how I got here."

LANI: *"Oh Iggy, that was a very long journey. You must be exhausted!"*

IGGY: *"Lani, tell me your story. How did you get here?"*

LANI: *"My story is pretty short, and not nearly so dramatic! I was just hanging out with MY bunch, right here at a local farm in Hawai'i! We were growing nicely, and getting ripe on our tree...just a nice yellow! Then the farmer harvested our bunch and put us on a truck and in about 10 minutes we were at the Farmers' Market. That's where this nice family bought me and then brought me home in their car. And that's my story!"*

"Well I guess we better rest now, it's getting pretty late. Good night Iggy."

IGGY: *"Good night Lani."*

MODERN DAY FOOD SYSTEMS

12 MINUTES

Hold up the imported banana.

“What is the difference between food from the grocery store, such as this banana, and a banana from a tree in your yard in terms of how you get it to your house?”



Possible answers: transportation/fuel/energy/boats, cars, airplanes, etc.

“Let’s look at the typical journey of an imported banana like “Iggy” and how it gets here to Hawai’i and onto your plate. Each of you will get a card with either a place, mode of transportation or an environmental or nutritional impact on it and together we will map this banana’s journey from the banana farm to your house.”

Pick one student to hold the imported banana.

Distribute Food Systems Mapping Cards to the rest of the students in the class. Have students remain seated until their card is called.

Call up the student holding the “Farm” card and have them place it on the far left side of the clothesline or whiteboard. Have the student holding the “Home” card place it on the far right side of the clothesline or board to illustrate Ecuador’s distance from Hawai’i.

**Tracking Food Miles**

“This imported banana was harvested several weeks ago from a farm in Ecuador when it was still green. First it goes by truck to a processing plant, where the large bunches are cut into smaller “hands” of bananas, like this.” — Call up students with a “farm truck” and “processing plant” card.

**ACTIVITY TIPS AND KEY**

As you recount the journey of Iggy the Imported Banana, call students up one at a time to place their cards in the correct food system order. Use magnets/tape on the board or string with clothespins to hold cards as students bring them up. The transportation cards should be placed between the location cards. The student holding Iggy the Imported Banana should travel with the cards as they are added.

Food System #1: Imported banana from Ecuador

1. Farm
2. Farm Truck (Pollution)
3. Processing Plant (Packaging)
4. Truck (Pollution)
5. Ship or Plane (Pollution)
6. Truck (Pollution)
7. Distribution Center (Packaging & Loss of Nutrients)
8. Truck (Pollution)
9. Grocery Store (Plastic Bag)
10. Car (Pollution)
11. Home

~ 6000
MILES

“At the processing plant, they place stickers on the bananas to tell the consumer where they came from. They also wrap the bananas in plastic bags, and pack them into cardboard boxes.”



“The processing plant then sends its bananas all over the place to different countries and states, including Hawai’i. On the mainland, they use trucks and trains for this. For the bananas to get to Hawai’i they must use a truck to get to the dock or airport and then a ship or an airplane to get to Hawai’i.” — Call up the students with the “truck,” “ship” and “plane” cards.



MODERN DAY FOOD SYSTEMS

CONTINUED

“Once the bananas make it to Hawai‘i, another truck drives them to the distribution center on the island. This is where the bananas are sprayed with ethylene to ripen them from green to yellow. Then the distribution center repackages them into different boxes and then another truck transports the bananas to your local grocery store. — Call up the students with the “truck,” “distribution center,” “truck,” and “grocery store” cards.



“Finally you and your parents go to the grocery store to buy the banana and drive it home.” — Call up students with the “grocery store,” “car,” and “home” cards.



“Wow! That’s a long journey for a banana, isn’t it? If you add up all the miles it took for this banana to get from Ecuador to your home, you get the **FOOD MILES** for this banana ...which is close to 6,000 miles. The distance it takes to get food from a farm to your plate is measured in **FOOD MILES**.”

Environmental Impacts

“**FOOD MILES** are important because they show us the environmental impact of importing our food.”

“Transportation takes fuel and what does burning fuel do to our environment?”

Desired answer: Pollution!

“Yes, transportation such as trucks, planes, and ships burn fuel in order to move, and burning fuel produces pollutants that go into our air.”

Invite the students with the “pollution” cards to come up and put their cards next to each form of transportation in the food system on the board.



“**POLLUTION** is one example of an environmental impact from a food system. Food **PACKAGING** is another. It is often necessary to package food to keep it fresh and protected from moisture, insects or bumps and bruises. Foods that travel far distances must be packaged to keep them safe.”

“Packaging is often applied to foods at the processing plant and then again at the distribution center.”

Invite the students with the “packaging” cards to come up and place the cards next to the “processing plant” and “distribution center” on the board.

“Why does packaging impact our environment?” Entertain a few student answers.



“Well there are 2 main reasons. Packaging uses natural resources and creates waste. What kind of natural resources does food packaging come from?”

Possible answers: plastic (oil), paper (trees), glass, aluminum.

“When this packaging is thrown away it creates waste. What can we do to eliminate waste from packaging?” Entertain a few answers

Desired Answer: “Practice the 3 R’s – Reduce, Reuse and Recycle!”

MODERN DAY FOOD SYSTEMS

CONTINUED

"Most people go to the store and bring their groceries back home in plastic bags."



Invite the student with the "plastic bag" card to stand next to the "grocery store."

"What could you do differently to reduce this waste?"

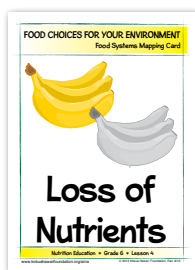
Desired answer: Bring a reusable bag!

**Nutritional Impacts**

"Great! In addition to these environmental impacts, there are nutritional impacts on imported bananas because of their journey. Bananas that have a long distance to travel are usually picked while they are still green so that they ripen on the way or they are sprayed with ethylene at the distribution center to accelerate ripening. This way the imported bananas is perfectly yellow and ripe at the store."

Invite the student with the "loss of nutrients" card to come up and place it next to the "distribution center" on the board.

"When food is removed from a plant before it is ripe and has to travel a long way, there is a LOSS OF NUTRIENTS. When we eat foods that are close to the source, but are also picked closer to ripeness, they contain higher levels of nutrients and are better for our bodies. One way to do that would be to buy fruits and vegetables that don't have such a long way to travel, like those grown and picked here in Hawai'i!"



Food System Mapping Card

Point to all of the cards on the wall/whiteboard or string and briefly summarize the imported banana's journey while highlighting the environmental and nutritional impacts of each step in the system: pollution, packaging and loss of nutrients. Leave the cards up for the next activity.

COMPARING FOOD SYSTEMS

5 MINUTES

"Now we are going to compare the journey of a locally grown banana to the imported banana." Hold up the locally-grown banana.



"Look at the Comparing Food Systems Student Worksheet in your workbooks. For each food system, write down the steps it took to get the banana from the banana farm to your home. Include the transportation required and the environmental and nutritional impacts as a result."

Point to the board and ask students, "Which steps can be eliminated if the banana was grown in Hawai'i?"

Desired Answer: No boat or plane was needed to get it here. The associated pollution would go away.

"Yes, you're right!" Remove the following cards from the board: truck #2, pollution #2, container ship, plane, pollution #3.

"This means locally grown bananas have fewer **FOOD MILES** than imported bananas because they traveled less to your plate. Less travel means less **POLLUTION!**"

"If a locally-grown banana is bought at the grocery store does it still go to the processing plant and distribution center or do farmers drop it off themselves?"

Desired answer: Yes!

"Yes, they still go to the processing plant and distribution center."

"What about if a banana was bought at the Farmers' Market? Would it go to the processing plant or distribution center?"

Desired answer: No!



ACTIVITY TIPS AND KEY

Food System #2: Locally-grown banana sold at the Grocery Store

1. Farm
2. Farm Truck (Pollution)
3. Processing Plant (Packaging)
4. Truck (Pollution)
5. Distribution Center (Packaging, Loss of Nutrients)
6. Truck (Pollution)
7. Grocery Store (Plastic Bag)
8. Car (Pollution)
9. Home

LESS THAN 100 MILES

Food System #3: Locally-grown banana sold at the Farmer's Market

1. Farm
2. Farm Truck (Pollution)
3. Farmer's Market
4. Car (Pollution)
5. Home

LESS THAN 100 MILES

Food System #4: Locally-grown banana grown in Home Garden

1. Home Garden

0 MILES

"And what other environmental and nutritional impacts would this cut out?"

Desired answer: Less trucks so less pollution and less packaging!

"Right! Less pollution and less packaging. Also, most food sold at Farmers' Market is picked ripe so it is fresh and nutritious and didn't lose any nutrients during transportation."

Replace the "grocery store" card with the "farmers' market card" on the board. Then remove the "processing plant", "distribution center", "loss of nutrients", 2 "truck," 2 "pollution," and 2 "packaging" cards.

COMPARING FOOD SYSTEMS

CONTINUED

Give students a couple minutes to complete the worksheet then check in with the class to review.

“Which of the food systems has the least impact on the environment and better nutrient value as a result?”

Desired answer: the locally-grown banana grown at home!

“Yes, if you had a banana patch in your backyard, you could simply walk outside and pick bananas off of your tree.”



Take away the “farm,” “truck,” “pollution,” “farmer’s market,” and “bike” cards leaving only the “home” card. Point out that there is a banana in the picture of the house.

“This food system would have ZERO FOOD MILES! Wow, that is really close to the source isn’t it!”

“Which is second best? Which is third?”

Desired answer: the locally-grown banana sold at farmers’ market is second and the locally-grown banana grown sold at grocery store is third.

“Right! As you can see, not as many resources are required to get the locally-grown bananas to your home. And there was less pollution, packaging, or loss of nutrients as a result. Growing our own food is great for our bodies and our environment.”



“We all live on an island in the middle of the ocean, and our natural resources such as land and water are very precious. We need to be stewards of our islands and protect our ‘āina by considering where our food comes from.”

EVALUATING FOOD CHOICES: THE 'ĀINA SCORE

5 MINUTES

If time is available, have the students turn to The 'ĀINA Score Student Worksheet in their workbooks.

Tell the class that they will be evaluating 10 different foods, two from each category of the Food Guide. These foods are: homegrown tomatoes, imported bananas, imported white rice, Waiāhole poi, mainland milk, Wahiawā eggs, Italian olive oil, Moloka'i avocados, "Apple Jills" cereal, and soda. They will use the worksheet to help them determine which foods are closer to the source based on their 'ĀINA Scores.

The 'ĀINA Score measures what kind of impact foods have on our bodies as well as on our environment using a scale from 1 to 10. The higher the 'ĀINA score, the better it is for our environment and our bodies.

For each food, have the students place an "A" next to each applicable environmental or nutritional benefit. They will calculate each food's 'ĀINA score by adding up the "A"s in each column. As a group, work through the first pair of foods to ensure students understand the activity.

Pass out the snack while the students complete the worksheet.

If time permits, discuss the four questions with the class. If not, the students can complete the worksheet for homework.

1. Which foods score 7 or higher and provide the most benefit for our health and environment? Answers: Homegrown tomatoes, Waiāhole Poi, Wahiawā Eggs, Italian Olive Oil, Moloka'i Avocados.
2. Which foods score 3 or lower and have the worst impact on our health and environment? Answers: Apple Jills and Soda.
3. Which food is closest to the source? Answer: Homegrown tomatoes
4. What other questions should you ask when evaluating a food? Possible answers: Who grew this food? How are the growers treated? How did it get here? Were pesticides used?

ACTIVITY TIPS AND KEY

'ĀINA Scores will vary based on assumptions students make about each food's packaging and the farming practices used to grow it. This uncertainty is an opportunity to discuss the importance of knowing where our food comes from.

These are typical 'ĀINA Score ranges you might see:

- Homegrown Tomatoes: 9-10
- Imported Bananas: 5-6
- Imported White Rice: 5-6
- Waiāhole Poi: 8-9
- Mainland Milk: 5-6
- Wahiawā Eggs: 6-7
- Italian Olive Oil: 7-8
- Moloka'i Avocados: 7-8
- Apple Jills Cereal: 1-2
- Soda (plastic bottle): 2-3

The higher the 'ĀINA Score, the better!

Student Worksheet
THE 'ĀINA SCORE
Lesson 4 – Food Choices for Your Environment

Directions: Evaluate how close to the source each food is by giving it an "A" for every environmental or health benefit listed on the left.

	Protective Foods	Energy Foods	Body Building Foods	Brain Foods	Caution Foods					
	Homegrown Tomatoes	Imported Bananas	Imported White Rice	Waiāhole Poi (poi)	Mainland Milk	Wahiawā Eggs	Italian Olive Oil (imported)	Moloka'i Avocados	Apple Jills Cereal	Soda (Plastic Bottle)
Whole or minimally processed										
No added fats										
No added salts										
No added sugar										
No artificial ingredients										
No plastic packaging										
No paper packaging										
Grown in Hawaii?										
Grown without pesticides										
Grown in a home garden										
'ĀINA Score Out of 10:										

1. Which foods score 7 or higher and provide the most benefit for our health and environment?
 2. Which foods score 3 or lower and have the worst impact on our health and environment?
 3. Which food is closest to the source?
 4. What other questions should you ask when evaluating a food?

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The 'ĀINA Score Student Worksheet

CLOSE TO THE SOURCE SNACK

3 MINUTES

DOCENT NOTES

- Point out that anyone with a known allergy to any of the food items should not touch or sample it. By this age, kids should know this about themselves, but please bring it to the attention of the teacher who can make sure that any students with known allergies or intolerances do not receive snacks.
- You may use the Lesson Supply Bin lid as a serving tray.
- Give a snack to the teacher and any other classroom aides.
- Please refrain from verbalizing your own food preferences and be aware of your body language and facial expressions. These subtle cues have a big impact on a child's willingness to try foods!
- Encourage the students to try the snack. Remind them of the "no yuck" rule: they can choose not to try any foods they wish, but if they do try them, they must keep their personal opinions to themselves.
- See the ĀINA Food Guide video at kokuahawaiifoundation.org/ainavideos for a discussion on the concept of eating close to the source.

Distribute food samples on paper napkins:

- 1"-2" section of imported banana
- 1"-2" section of locally-grown banana

As students are trying their food sample, ask what they think of each. Engage the students while they are eating by asking questions such as:

- Do the fruits look different?
- Is there a difference in taste?
- Where could they find the local fruit on island? (Farmers' markets, some grocery stores...)

Remind students that both bananas are close to the source foods and that while the locally grown banana is preferred, both are great food choices.

TOTE BAG NOTES

Hawai'i educators who would like to give reusable bags to their students as part of this lesson may apply for a Kōkua Hawai'i Foundation Mini-Grant to do so. Reusable water bottles are another item that may be provided to students to empower them to reduce waste by reusing.

Optional Activity:

Gifts - Reusable Tote Bag

"One thing we can do that's even better than recycling is RE-USING. These tote bags are for you to use again and again at the farmer's market or the store so you don't have to take a paper or plastic bag which uses our natural resources and goes into our waste stream."



"By doing our best to reduce, reuse, and recycle, we can take care of our island home and protect our land and water."

"And by doing our best to find foods grown in Hawai'i we can be sure that they are closer to the source and typically fresher and more nutritious than foods shipped to us from across the ocean."



Give gifts to the classroom teacher for distribution to the students later. Make sure there is one bag for each student and the classroom teacher.

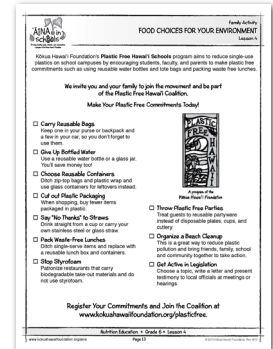
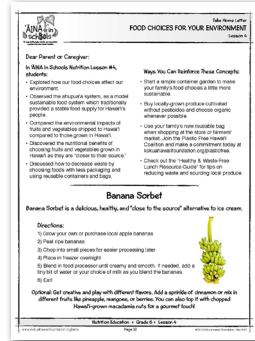


CLOSING

2 MINUTES

Provide a quick review:

- Native Hawaiians have a tradition of environmental **STEWARDSHIP**, protecting their **NATURAL RESOURCES** and eating locally grown food.
- “**FOOD MILES**” describe the distance your food travels from the farm to your home. More food miles usually means more environmental impact.
- Environmental impacts of our food include **POLLUTION** and **PACKAGING**.
- **LOSS OF NUTRIENTS** occurs in foods that travel long distances and/or are picked before they are ripe
- **CLOSE TO THE SOURCE** = Locally grown, fresh produce that is better for your body and the environment!



Review the Take Home Letter and Plastic Free Hawai‘i materials:

- “Share the take-home letter with your parents and try making the banana sorbet recipe together. It’s an easy treat you can make using local apple bananas.”
- “Review the Plastic Free Hawai‘i page together and make sure you bring your reusable bag on shopping trips to the grocery store and farmers’ market.”
- Encourage students to create their own recipe using locally grown produce, especially Hawaiian canoe plants like mai‘a (banana), kalo, ‘ulu (breadfruit), and ‘uala (sweet potato). Students may use the ‘ĀINA Recipe Challenge form at the end of their ‘ĀINA Nutrition Student Workbooks to share their creations. Kōkua Hawai‘i Foundation will select recipes to feature in future blog posts, newsletters, and cookbooks.



Thank the students for doing such a great job!

THANK YOU!

DOCENT NOTES

- **Pack your trash!** Please leave the classroom cleaner than you found it by removing all lesson-based trash. We don’t want to add any burden or extra trash for the teachers or custodians so please do not throw away any trash in the classroom garbage. Instead:
 - Collect napkins and any leftovers.
 - Uneaten bananas and/or peels may be composted if available at the school.
 - Use the garbage bag in the Lesson Supply Bin to remove all lesson-related food items from the classroom.
- Please do not leave any food in the supply bin. Perishable props have been known to get moldy and smelly when left in the bin after the last lesson.
- Please complete your online docent survey for this lesson. This is valuable feedback that helps to improve our program.
- Please collect any ‘ĀINA Recipe Challenge submissions and turn in to KHF staff at the next docent training.

ADDITIONAL RESOURCES

Books

- ***The Omnivore's Dilemma: Young Readers Edition*** by Michael Pollan
From fast food and big organic to small farms and old-fashioned hunting and gathering, this young readers' adaptation of Pollan's famous book encourages kids to consider the personal and global health implications of their food choices.

Lesson Plans & Curricula

- **Aloha 'Āina Curriculum, Pacific American Foundation:** thepaf.org/alohaaina
Culturally relevant lessons on the ahupua'a system inspiring keiki to care for the land.
- **"Farmer Freeze Tag," Big Green:** biggreenathome.org/weekly/farmer-freeze-tag
Get active while thinking about food systems. This is a fun take on freeze tag.
- **"Reflecting on Food: Food Choices," The Edible Schoolyard Project:** edibleschoolyard.org/reflecting-food-food-choices
This activity helps students to think about their personal priorities around food choices and can be used before and after the "Food Choices for Your Environment" 'ĀINA Lesson for self reflection.
- **"Strawberries and Pesticides," The Edible Schoolyard Project:** edibleschoolyard.org/strawberries-and-pesticides
This lesson explores the history and impacts of pesticide use in strawberry farming.
- **Understanding Food and Climate Change:** ecoliteracy.org/download/understanding-food-and-climate-change-interactive-guide
This guide uses video, photography, text, and interactive experiences to help educators, students, and advocates learn how food and climate systems interact and how personal choices can make a difference.

Videos

- **"ĀINA Food Guide," Kōkua Hawai'i Foundation:** kokuahawaiifoundation.org/ainavideos
Explore the categories of the 'ĀINA Food Guide and the choosing Close to the Source Foods.

- **"Closer to the Source," Honolulu Theatre for Youth:** membership.htyweb.org/food-episode
Based on HTY's production "Grinds: The Story of Food in Hawai'i," this episode (24 min.) is a fun take on eating local. Be sure to check out their rendition of this lesson's Banana Skit (3 min.)!
- **"E 'Ai Kākou":** oiwi.tv/tag/e-ai-kakou/
A four episode series on preparing and eating traditional foods of Hawai'i.
- **Field to Fork - Why Local Food Matters:** youtube.com/watch?v=xS1SKiypHME
Four short animated videos from the UK about food miles.
- **"Regenerating Paradise" Video Series:** bit.ly/regparadise
How regenerative local food systems can support the economy, culture, and community health.
- **True Food TV:** howgrow.org/foods
A series telling the stories of several foods from field to fork.

Additional Resources

- **"Food System Primer," Johns Hopkins Center for a Livable Future:** foodsystemprimer.org
Short readings on food system topics with links to resources to help educators dig deeper.
- **"Issues Page," FoodPrint:** foodprint.org/the-total-footprint-of-our-food-system/issues/
How food production issues are interconnected.
- **"I Value Food," Sustainable America:** ivaluefood.com/resources
Several resources for reducing food waste.
- **"Shopper's Guide to Pesticides in Produce," Environmental Working Group:** ewg.org/foodnews/
Ranks pesticide load of many fruits and vegetables.
- **US Food Sovereignty Alliance:** usfoodsovereigntyalliance.org
Advocates for healthy, culturally appropriate food, produced in an ecologically sound manner.

Find more at
kokuahawaiifoundation.org/ainalessons