



## Promoting Sustainability Through a School Garden

### **BACKGROUND:**

#### Lesson Background:

If there is one thing that all students have in common, it is a shared love of food. Food is not only a necessity to live, but also another means of how people express themselves and share their love with one another. However, food insecurity is a major issue in Hawai‘i. Thirteen percent of Hawai‘i’s total population is considered to be food insecure. This means one in five local residents, including approximately 50,000 children, must receive food assistance through Hawai‘i’s emergency food relief system. Although always appreciated, much of the donated food acquired from these systems lacks nutritional quality with high sugar and fat content (Hawai‘i Department of Health, 2008). By producing our own food, communities will not only have more food to eat, but will also know its source and be assured of its quality. Through this unit, students will learn about sustainability and what it could mean to a community to be food sustainable. Gardens reduce food costs as well as the amount of food that must be imported to Hawai‘i. According to an article written by the Hawai‘i Department of Health, concerns have surfaced when it was revealed that between 85 to 90 percent of Hawai‘i’s food is imported due to its remote location. Much of this food comes from over 2,500 miles away. Students will learn that we must take the initiative to produce food that’s closer to home to ensure sustainability for local residents and communities; a garden being a first small step. Students will also learn about many other ways that gardens support sustainable practices. This unit provides the opportunity for students to explore other sustainable practices that are related to gardening such as composting, creating art, and dyeing materials. As embedded into the second grade curriculum and standards, students utilize knowledge of pollination as well as what plants need to grow and survive (e.g. water and sunlight). Although not required, it would be helpful for students to have learned these concepts or have at least some background information on these topics. By implementing this unit after these specific topics are taught, educators will fluently build on students’ prior knowledge.

Community partner integration is important in designing meaningful curriculum that helps to connect students to real world situations that relate to their own lives. An important part of this unit is that students witness the size and operations of a local farming business on the island. This unit encourages the opportunity for students to travel and meet the managers of Rising Sun Organic Farms, a local farm located in Moloa‘a on the island of Kaua‘i. They will teach students about their mission to farm fresh local products with their commitment to organic farming methods. Community partnerships will assist in providing students with the necessary knowledge of how to care for and maintain their school garden.



## Unit Overview:

This interdisciplinary unit is designed for use in the second grade classroom. Throughout the unit's weekly lessons and activities, students will learn how a garden can serve as a solution towards creating a community that is self-sustaining. They will then have the opportunity to design, engineer, and create a small school garden. The students will select and conduct research on a selected plant to plant in the garden. Students will also learn about composting, create artworks, and dye material using resources that come from their garden. Finally, students will create a proposal to demonstrate their learnings as well as advocate for the construction of a garden. As a group, students will select the location around which the proposal will be created depending where they believe the island would best benefit from having a garden. They will share their final group proposal to their families and school faculty as well as the appropriate community members and partners who will be invited to attend.

## STAGE 1:

This unit will allow students to apply various discipline concepts that they are learning throughout the school year to hands-on and project-based activities that allow them to make real world connections. By the end of this unit, students will understand how a garden can support sustainable practices for not only themselves, but their local communities. Although students will have the opportunity to help design and create a garden on school grounds, it is important for students to understand that its concepts can be extended to their own homes or local neighborhoods.

**Unit Plan Title:** Promoting Sustainability Through a School Garden

**Essential Question:** How can a garden support sustainable practices to help local communities?

**Enduring Understanding(s):**

- Students will understand the meaning and importance of sustainability.
- Students will understand the steps to create a functioning garden.
- Students will understand how a garden can provide food sustainability.
- Students will understand other various sustainable uses of a garden (e.g. composting, artwork, dyeing material, etc.).



## Standard Benchmarks and Values

Science	Technology	Engineering	Mathematics	Social Science
<b><u>STANDARDS INTRODUCED:</u></b>				
<b>NGSS - PERFORMANCE EXPECTATIONS</b>				
<b>K-2-ETS1-2</b> Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem				
<b>NGSS - SCIENCE AND ENGINEERING PRACTICES</b>				
<b>Developing and Using Models</b>				
A practice of both science and engineering is to use and construct models as helpful tools for representing ideas and explanations. These tools include diagrams, drawings, physical replicas, mathematical representations, analogies, and computer simulations.				
<b>COMMON CORE - MATHEMATICS</b>				
<b>2.MD.1</b> Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.				
<b>2.MD.3</b> Estimate lengths using units of inches, feet, centimeters, and meters.				
<b>2.MD.5</b> Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.				
<b><u>STANDARDS ADDRESSED:</u></b>				
<b>ISTE - TECHNOLOGY</b>				
<b>Standard #3: Knowledge Constructor</b>				
(D) Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.				
<b>COMMON CORE - MATHEMATICS</b>				
<b>2.OA.1</b> Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with				



a symbol for the unknown number to represent the problem.

**2.NBT.5** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

**2.NBT.6** Add up to four two-digit numbers using strategies based on place value and properties of operations.

### **STANDARDS FOR MATHEMATICAL PRACTICE**

**Standard #1** Make sense of problems and persevere in solving them

**Standard #2** Reason abstractly and quantitatively

**Standard #4** Model with mathematics

**Standard #5** Use appropriate tools strategically

### **COMMON CORE - LANGUAGE ARTS**

**2.SL.3** Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

**2.SL.4** Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.

### **STANDARDS ASSESSED:**

#### **NGSS - PERFORMANCE EXPECTATIONS**

**2-L2-1** Plan and conduct an investigation if plants need sunlight and water to grow

#### **ISTE - TECHNOLOGY**

##### **Standard #6: Creative Communicator**

(D)Students publish or present content that customizes the message and medium for their intended audiences.

### **COMMON CORE - LANGUAGE ARTS**

**2.W.1** Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

**2.W.8** Recall information from experiences or gather information from provided sources to answer a

question.

**2.SL.1** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.

- (A) Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
- (B) Build on others' talk in conversations by linking their comments to the remarks of others.
- (C) Ask for clarification and further explanation as needed about the topics and texts under discussion.

### **HCPS III - SOCIAL STUDIES**

**SS.2.5.1** Demonstrate own roles and responsibilities in caring for others and the environment

#### Sense of Place (Nā Hopena A'ō and beyond)

##### **Standard #1: Strengthened Sense of Belonging**

- (B) Know about the place I live and go to school
- (H) Actively participate in school and communities

##### **Standard #2: Strengthened Sense of Responsibility**

- (B) See self and others as active participants in the learning process
- (D) Ask for help and feedback when appropriate
- (H) Honor and make family, school and communities proud

##### **Standard #3: Strengthened Sense of Excellence**

- (H) Assess and make improvements to produce quality work

##### **Standard #4: Strengthened Sense of Aloha**

- (A) Give generously of time and knowledge
- (E) Respond mindfully to what is needed
- (G) Share the responsibility for collective work
- (H) Spread happiness

##### **Standard #5: Strengthened Sense of Total Well-Being**

- (E) Utilize the resources available for wellness in everything and everywhere
- (G) Engage in positive, social interactions and has supportive relationships



### Critical Skills and Concepts:

- Explain the definition of sustainability
- Explain the importance of sustainability
- Advocate a garden as a sustainable solution for communities
- Be able to care for and maintain a garden
- Undergo engineering design process to solve a community issue

### STAGE 2:

At this point in the unit, students have learned and had many class discussions about the definition of sustainability. They have also learned that gardens can be used for more than just producing food and support many other sustainable practices (e.g. composting, creating artwork, dyeing material). Throughout lesson activities, students have had various opportunities to work with other students to celebrate accomplishments, overcome a few challenges as well as build on one another's ideas. Students have also planted their selected plants into the school's garden and have been continuously participating in a rotating maintenance schedule.

### Authentic Performance Tasks:

Students will demonstrate their understanding by designing, creating, and maintaining a school garden as a way to promote sustainable practices in their local communities. Students will then design a collective proposal, to an audience of their choice, to advocate for the construction of a garden in a location on the island they believe would best benefit from having a garden. During this proposal, students will share their learnings about sustainability and how gardens promote multiple sustainable practices.

### Authentic Audience:

The students will share their garden and proposal during a designated school event. School faculty, families of students, community partners, and other community members related to students' selected location will be invited to attend.

### Other Evidence:

- Lesson worksheets
- Student notebooks (drawings, reflections, notes, etc.)
- Teachers' observations



### STAGE 3:

Students learn best when efforts are made by the teacher to differentiate instruction to accommodate students' various learning styles. Many students that this unit was originally designed for learn best through hands-on experiences that allow them to move around the classroom and even go outside. Students also learn best when the concepts they are learning are relevant to their own lives. This unit allows students to work outside in a garden, but also allows them to make an impact in their own communities.

#### Duration of Unit:

All lessons will take place after school through the Gardening Club from approximately 2:25pm till 3:45pm. These sessions will occur every Friday except during school breaks and holidays. This unit will take about 12 sessions to complete in addition to one place-based learning experience and an event for students to present their collective proposal.

#### Learning Plan:

Week	Date	Lesson Activities	Lesson Objective(s)/Goal(s)
1	2/7/20	Google Slides: <a href="#">Week 1 Slides</a> Lesson Plan: <a href="#">Week 1 Lesson Plan</a> <ul style="list-style-type: none"> <li>● Ice breaker activity: Pick-a-Stick activity (get to know you)</li> <li>● Introduce and set up student notebooks</li> <li>● Video: <a href="#">Video Link</a></li> <li>● Brain Break (snack of the week)</li> <li>● Introductory game to share some general facts about gardens with students</li> <li>● Student notebook:               <ul style="list-style-type: none"> <li>○ Left: What do you know about food gardens (what they are used for, what do they look like, how do you take care of one, etc.)?</li> <li>○ Right: Draw, label, and color pictures of foods that you think people grow in gardens.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Students will explain the importance of food.</li> <li>● Students will understand current food security issues in Hawai'i and their local communities.</li> <li>● Students will explain the importance and benefits of a food garden.</li> <li>● Students will explain and illustrate their current knowledge on gardens and express what they want to learn about gardens.</li> </ul>
2	2/14/20	Google Slides: <a href="#">Week 2 Slides</a> Lesson Plan: <a href="#">Week 2 Lesson Plan</a>	<ul style="list-style-type: none"> <li>● Students will understand the concept and definition of</li> </ul>

		<ul style="list-style-type: none"> <li>• Administer students' pre-surveys</li> <li>• Brain Break (snack of the week)</li> <li>• Introduction to definition of sustainability</li> <li>• Students work in their assigned Garden Groups to select an item to plant in their section of the garden</li> <li>• Student notebook:             <ul style="list-style-type: none"> <li>○ Complete coloring title page and entry from Week 1</li> </ul> </li> </ul>	<p>sustainability.</p> <ul style="list-style-type: none"> <li>• Students will be able to provide examples of sustainable and unsustainable practices.</li> <li>• Students will understand that gardens are one way to promote sustainable practices.</li> <li>• Students will communicate effectively with their classmates to select the food item that their group will plant in the school garden.</li> </ul>
3	2/21/20	<p>Google Slides: <a href="#">Week 3 Slides</a> Lesson Plan: <a href="#">Week 3 Lesson Plan</a></p> <ul style="list-style-type: none"> <li>• Review definition of sustainability</li> <li>• Building a Salad Math activity</li> <li>• Complete Feeding Community Information worksheet</li> <li>• Brain Break (snack of the week)</li> <li>• Students work in their Garden Groups to conduct research on the item that they chose to plant in their section of the garden during Week 2</li> </ul>	<ul style="list-style-type: none"> <li>• Students will understand the concept and definition of sustainability.</li> <li>• Students will understand that gardens are one way to promote sustainable practices.</li> <li>• Students will calculate the total amount of money they could save by growing food in a garden</li> <li>• Students will understand that gardens can provide food security for communities.</li> <li>• Students will communicate effectively with their classmates to conduct research on their selected garden food item.</li> </ul>
4	2/28/20	<p>Google Slides: <a href="#">Week 4 Slides</a> Lesson Plan: <a href="#">Week 4 Lesson Plan</a></p>	<ul style="list-style-type: none"> <li>• Students will understand the concept and definition of</li> </ul>



		<ul style="list-style-type: none"> <li>● Review definition of sustainability</li> <li>● What Do We Need To Buy activity (students calculate how much wood is needed to build their garden boxes)</li> <li>● Brain Break (snack of the week)</li> <li>● Students work in their Garden Groups to continue research from last lesson on the item that they chose to plant in their section of the garden during Week 2</li> </ul>	<p>sustainability.</p> <ul style="list-style-type: none"> <li>● Students will understand that gardens are one way to promote sustainable practices.</li> <li>● Students will calculate the total amount of wood needed to build their garden beds.</li> <li>● Students will communicate effectively with their classmates to conduct research on their selected garden food item.</li> </ul>
5	3/6/20	<p>Google Slides: <a href="#">Week 5 Slides</a> Lesson Plan: <a href="#">Week 5 Lesson Plan</a></p> <ul style="list-style-type: none"> <li>● Review definition of sustainability</li> <li>● Introduction to how gardens can be used to create art</li> <li>● Video: <a href="#">Video Link</a></li> <li>● Brain Break (snack of the week)</li> <li>● Painting with Soil Activity</li> <li>● Students can catch up on any missing or incomplete worksheets</li> </ul>	<ul style="list-style-type: none"> <li>● Students will understand the concept and definition of sustainability.</li> <li>● Students will understand that gardens are one way to promote sustainable practices.</li> <li>● Students will create paint from soil and their own paintings.</li> <li>● Students will communicate effectively with their classmates to conduct research on their selected garden food item.</li> </ul>
6	3/13/20	<p>Google Slides: <a href="#">Week 6 Slides</a> Lesson Plan: <a href="#">Week 6 Lesson Plan</a></p> <ul style="list-style-type: none"> <li>● Review definition of sustainability</li> <li>● Introduction to garden tools and how to use them</li> <li>● Explanation of planting procedures</li> <li>● Work time in garden: Students will put soil into their group's garden bed and plant their individual</li> </ul>	<ul style="list-style-type: none"> <li>● Students will understand the concept and definition of sustainability.</li> <li>● Students will understand that gardens are one way to promote sustainable practices.</li> </ul>

		<p>plants</p> <ul style="list-style-type: none"> <li>● Brain Break (snack of the week)</li> <li>● Students clean up garden tools</li> <li>● Students can catch up on any missing or incomplete worksheets</li> </ul>	<ul style="list-style-type: none"> <li>● Students will identify various gardening tools and their uses.</li> <li>● Students will plant their selected plant in their group's garden box.</li> </ul>
7	3/27/20	<p>Google Slides: <a href="#">Week 7 Slides</a> Lesson Plan: <a href="#">Week 7 Lesson Plan</a></p> <ul style="list-style-type: none"> <li>● Review definition of sustainability</li> <li>● Review Quarter 4 watering schedule and procedures</li> <li>● Review procedures to plant in planter boxes</li> <li>● Work time in garden: Students will transplant plants into planter boxes. Students will also scoop soil into individual pots and plant their chosen seeds (basil or green onion)</li> <li>● Brain Break (snack of the week)</li> <li>● Class discussion on where gardening soil came from &amp; how it (and compost) is created</li> <li>● Students can catch up on any missing or incomplete worksheets</li> </ul>	<ul style="list-style-type: none"> <li>● Students will understand the concept and definition of sustainability.</li> <li>● Students will understand that gardens are one way to promote sustainable practices.</li> <li>● Students will plant their selected plant in their group's garden box.</li> <li>● Students will know how compost and planting soil is created.</li> </ul>
8	4/3/20	<p>Google Slides: <a href="#">Week 8 Slides</a> Lesson Plan: <a href="#">Week 8 Lesson Plan</a></p> <ul style="list-style-type: none"> <li>● Students water and weed garden</li> <li>● Class discussion on creating compost from home with kitchen scraps</li> <li>● Game on what items are compostable and what is not</li> <li>● Brain Break (snack of the week)</li> <li>● Introduce proposal project           <ul style="list-style-type: none"> <li>○ Class discussion on proposal project objectives</li> <li>○ Class discussion on where on Kaua'i deserves a permanent garden (students vote to select one location that we will focus on next class session)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Students will understand that gardens are one way to promote sustainable practices.</li> <li>● Students will understand how composting benefits the environment.</li> <li>● Students will list school &amp; household items that can be used to make compost.</li> </ul>

9	4/17/20	<p>Google Slides: <a href="#">Week 9 Slides</a> Lesson Plan: <a href="#">Week 9 Lesson Plan</a></p> <ul style="list-style-type: none"> <li>● Review definition of sustainability</li> <li>● Students water and weed garden</li> <li>● Review project proposal objectives</li> <li>● Class discussion (make class list) on things that are needed to have a successful garden</li> <li>● Use list just created to narrow down list of locations to 2-3</li> <li>● Have students vote on a single location to focus proposal on</li> <li>● Brain Break (snack of the week)</li> <li>● Review different topics for proposal and assign topics to groups</li> <li>● Students work on Project Proposal (Draft #1) worksheet</li> </ul>	<ul style="list-style-type: none"> <li>● Students will understand the concept and definition of sustainability.</li> <li>● Students will understand that gardens are one way to promote sustainable practices.</li> <li>● Students will select a single best location to create a proposal for a permanent garden that benefits the community.</li> </ul>
10	4/24/20	<p>Google Slides: <a href="#">Week 10 Slides</a> Lesson Plan: <a href="#">Week 10 Lesson Plan</a></p> <ul style="list-style-type: none"> <li>● Review definition of sustainability</li> <li>● Students water and weed garden</li> <li>● Review project proposal objectives</li> <li>● Students finish Project Proposal (Draft #1) worksheet in groups</li> <li>● Brain Break (snack of the week)</li> <li>● Students use corrections and teacher feedback to write final draft of proposal section</li> </ul>	<ul style="list-style-type: none"> <li>● Students will understand the concept and definition of sustainability.</li> <li>● Students will understand that gardens are one way to promote sustainable practices.</li> <li>● Students will work in groups to write about one way gardens support sustainable practices.</li> <li>● Students will make corrections to their own writing and write a final draft.</li> </ul>
11	5/1/20	<p>Google Slides: <a href="#">Week 11 Slides</a> Lesson Plan: <a href="#">Week 11 Lesson Plan</a></p> <ul style="list-style-type: none"> <li>● Review definition of sustainability</li> <li>● Students water and weed garden</li> <li>● Review project proposal objectives</li> <li>● Students use corrections and teacher feedback to write final draft</li> </ul>	<ul style="list-style-type: none"> <li>● Students will understand the concept and definition of sustainability.</li> <li>● Students will understand that gardens are one way to promote</li> </ul>

		<p>of proposal section</p> <ul style="list-style-type: none"> <li>● Brain Break (snack of the week)</li> <li>● Students decide who will read each sentence during presentation</li> <li>● Students begin creating art visual for the proposal presentation</li> </ul>	<p>sustainable practices.</p> <ul style="list-style-type: none"> <li>● Students will work in groups to write about one way gardens support sustainable practices.</li> <li>● Students will make corrections to their own writing and write a final draft.</li> </ul>
12	5/8/20	<p>Google Slides: <a href="#">Week 12 Slides</a> Lesson Plan: <a href="#">Week 12 Lesson Plan</a></p> <ul style="list-style-type: none"> <li>● Review definition of sustainability</li> <li>● Students water and weed garden</li> <li>● Review project proposal objectives</li> <li>● Students practice and rehearse proposal presentation</li> <li>● Brain Break (snack of the week)</li> <li>● Students finish creating art visual for the proposal presentation</li> </ul>	<ul style="list-style-type: none"> <li>● Students will understand the concept and definition of sustainability.</li> <li>● Students will understand that gardens are one way to promote sustainable practices.</li> <li>● Students will verbally present their ideas on how gardens support sustainable practices.</li> <li>● Students will create visual art pieces expressing how gardens support sustainable practices.</li> </ul>
Field Trip	TBD	<ul style="list-style-type: none"> <li>● Students take a field trip to Rising Sun Organic Farms in Moloa‘a on Kaua‘i</li> <li>● Consider including the entire grade level (as requested by teachers)</li> <li>● Students participate in stations about gardening machinery/tools, organic gardening practices, farming animals, and preparing fresh and healthy meals</li> </ul>	<ul style="list-style-type: none"> <li>● Students will understand the importance of supporting local farmers</li> <li>● Students will understand the work their own communities are doing to support sustainable practices</li> <li>● Students will gain knowledge about how to best care for their school garden</li> </ul>
Presentation Day	TBD	<ul style="list-style-type: none"> <li>● Students present their final proposal project to the school faculty (e.g. administration, teachers), family members, and</li> </ul>	<ul style="list-style-type: none"> <li>● Students will effectively communicate their ideas on how gardens promote sustainable practices</li> </ul>

		<p>appropriate community members (depending on the location students proposal is based on)</p> <ul style="list-style-type: none"> <li>● Each group has a chance to recite the information on their topic and share their artwork that goes along with it</li> <li>● Audiences provide feedback and ask questions</li> <li>● Gallery walk to view students' artwork pieces</li> </ul>	<ul style="list-style-type: none"> <li>● Students will effectively communicate to advocate for the establishment of a permanent garden in their local community</li> </ul> <p><b><u>STANDARD ASSESSED:</u></b></p> <p><b>Standard #6: Creative Communicator</b>        (D)Students publish or present content that customizes the message and medium for their intended audiences.</p>
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