

A Sense of Place: Sustainable Living Is Rooted in a Deep Knowledge of Place and Self

Theme 1: Scope and Sequence - Grades K–8

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
Weather and Seasons	Names and patterns for local and regional weather	<p>Observe, describe, and name types of weather events. Understand how weather events affect humans.</p> <p>Measure, record, and graph rainfall and temperature.</p>	<p>Create a daily weather journal.</p> <p>Observe and record weather.</p> <p>Explore prior weather knowledge.</p> <p>Develop a weather word bank.</p> <p>Learn to read a thermometer and rain gauge.</p> <p>Collect, record, and graph temperature and rainfall.</p> <p>Learn Hawaiian names for rain and wind.</p>	<p>Assess natural weather events as they occur.</p> <p>Interpret observations of weather events.</p> <p>Identify the effects of weather events on human behavior.</p> <p>Recognize Hawaiian names, mo'olelo (stories), and oli (chants) for local weather patterns and phenomena.</p>	<p>Use qualitative and quantitative methods to collect and record daily weather observations over extended period of time.</p> <p>Graph or model collected quantitative or qualitative weather data (see above).</p> <p>Interpret graph or model to make predictions and draw conclusions about local weather patterns (see above).</p> <p>Research, analyze, and discuss names and patterns of local weather distinct to school's moku and ahupua'a.</p> <p>Hypothesize local weather patterns using traditional mo'olelo, oli, 'olelo no'eau (stories, chants, proverbs).</p> <p>Design and construct signage in garden using 'olelo no'eau, traditional names, and sayings for weather patterns.</p>	<p>Demonstrate knowledge of regional weather patterns and events, including ecological and cultural perspectives.</p> <p>Demonstrate knowledge of Hawaiian names to tell mo'olelo and recite oli for different weather patterns and events.</p> <p>Utilize observations about weather and seasons to make decisions regarding best garden practices (e.g., proper planting and harvesting times).</p>	<p>Use qualitative and quantitative methods to collect and record daily weather observations over extended period of time.</p> <p>Make inferences and predictions about local weather patterns based on data collection.</p> <p>Design and conduct an experiment using data from local weather patterns and events.</p> <p>Compare and contrast stories and chants (e.g., relationship between rain and lehua, wiliwili tree, and sharks).</p>
	Seasons and place	<p>Recognize and name the seasons of your area (e.g., rainy/dry, cool/hot, long/short day).</p>	<p>Observe and explain seasonal differences in the school garden and local area.</p>	<p>Apply concepts of plant-growing cycles in relationship to seasons and the role of the sun.</p>	<p>Introduce Makahiki season concepts as a traditional practice.</p>	<p>Explain local and global seasonal patterns, including solstice and equinox.</p>	<p>Observe and record the sun's movement over time using a sunstick/dial.</p>

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		Observe the role of the sun in daily and seasonal patterns.	<p>Observe and describe how the hours of daylight change throughout the year.</p> <p>Record daily temperature readings in multiple sites. Explain findings.</p> <p>Observe the impact of seasons on a nearby tree.</p> <p>Create a structure to reduce warming effects of sunlight.</p>	Relate and understand Makahiki (season) as a traditional practice.	<p>Compare and explain how Makahiki calendars differ from Western calendars.</p> <p>Design a seasonal calendar that is distinct to your school garden, applying concepts of Makahiki.</p>	Explain the relationship of day and night with wind and weather patterns.	<p>Model the relationship between sun and Earth to show how seasons are caused.</p> <p>Synthesize garden data log and observations.</p> <p>Create and implement to solve basic garden management tasks. (e.g., weeding and mulching, applying soil amendments).</p>
	The lunar cycle	<p>Observe and describe changes in the moon.</p> <p>Explain the moon's effect on plants.</p>	<p>Observe, describe, and draw changes in the shape of the moon over a lunar cycle.</p> <p>Explore the moon's influence on planting and harvesting.</p> <p>Learn a traditional chant, song, or verse relating to the moon.</p>	<p>Interpret the Hawaiian moon calendar.</p> <p>Describe the nightly and monthly names of the moon phases.</p> <p>Explain how the phases of the moon affect plant growth.</p>	<p>Make observations and explain relationships of moon phases to land, water, and self.</p> <p>Design and build models of a Hawaiian and Western moon calendar.</p> <p>Compare and contrast Hawaiian moon calendar with the Western calendar.</p> <p>Use Hawaiian moon calendar to guide planting and harvesting in the garden.</p> <p>Synthesize Hawaiian seasonality and Hawaiian moon calendar. Apply knowledge to garden practices.</p>	<p>Appraise the Hawaiian moon calendar as a reference and use it to inform garden activities.</p> <p>Describe how the relationship between sun, moon, and Earth creates lunar phases and eclipses.</p>	<p>Observe and record the moon's movement over time.</p> <p>Model the relationship between sun, Earth, and moon to show how phases and eclipses are caused.</p> <p>Plant, prune, propagate, and harvest according to the Hawaiian moon calendar.</p> <p>Learn and use Hawaiian moon-phase chant <i>Mele Helu Po</i>.</p>

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Names, Stories, and History of Place	Local and regional place names	<p>Know the name of the moku (district) and ahupua'a (land division) where your school is located.</p>	<p>Invite a local kupuna (respected elder) to tell stories of your school's place. Draw or describe the place based on that story.</p> <p>Ask family members to share place names.</p> <p>Introduce the ahupua'a poster.</p>	<p>Know the name of your ahupua'a and its meaning.</p> <p>Relate place names within an ahupua'a and explain the relationship to the landscape.</p> <p>Recount mo'olelo from places within the moku (district).</p>	<p>Introduce ahupua'a map.</p> <p>Compare and contrast place names and ahupua'a using historical and modern texts, as well as oral history.</p> <p>Find the location of your garden and the ahupua'a you live in.</p> <p>Interview a family or community member about traditional place names in your area. Describe how they have or have not changed over time.</p> <p>Investigate and index place names in your school's ahupua'a.</p>	<p>Reference your garden within your ahupua'a system.</p> <p>Using a map Identify and analyze place names within your ahupua'a.</p> <p>Explain the relationship between places names and culture and landscape, including the school garden.</p>	<p>Recognize and identify natural resources and occurrences in your garden that are specific to your ahupua'a or region (e.g., rains, winds, etc.).</p> <p>Identify characteristics or traits that these resources have based on your understanding of the landscape informed by knowledge of ahupua'a, place names, and mo'olelo (e.g., What is the name for the common rain/mist in Waimea? What are its characteristics?).</p> <p>Describe and identify the impact of these resources or occurrences on your garden and landscape. For example: The misty Kī pu'u rain nourishes the rainforest on the hills above Waimea, and causes mildew spots on the kabocha leaves.</p>
	Relationship of self to place	<p>Recall the story of how your family came to live in this place.</p>	<p>Students invite parents or kupuna to share a story of how their family came to live here.</p> <p>Draw, perform, or recall stories of how family and community came to live in your ahupua'a.</p>	<p>Investigate your personal relationship to the garden.</p>	<p>Write a response to a prompt or essential question (e.g., "I am the land, the land is me;" or what plant in the garden do you most identify with?).</p>	<p>Cite specific evidence to explain how you have impacted this place and this place has impacted you.</p>	<p>Draw a picture, write a poem, tell a story, sing a song, perform a dance or a chant that symbolizes your relationship to your garden or the 'āina (land).</p>

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	Local legends and stories	Retell a local story or legend about your school’s regional place.	<p>Invite a local expert or kupuna to tell stories of your school’s place.</p> <p>Draw and describe parts of the story (e.g., setting, characters).</p>	<p>Describe how legends relate to agriculture, climate, environment, and natural weather events.</p> <p>Apply legends to planting in the garden.</p>	<p>Listen to mo’olelo about native plants and apply concepts to planting, stewardship, or uses of those plants.</p> <p>Recite, chant or illustrate one mo’olelo learned in the garden.</p> <p>Using story of Hāloa, explain relationship between humans and land.</p> <p>Compare and contrast stories of other cultures and their relationships to place (land and plants).</p>	Present a minimum of two local stories or legends to an audience.	Recite, chant, or illustrate a minimum of two local stories or legends.
	Local agricultural history, practices, plants, and people	<p>Recognize and name plants in your school garden.</p> <p>Name and describe the local farming history in your area.</p> <p>Name the agricultural crops grown in your area.</p>	<p>Sort and classify plants in school garden by color, shape, smell, texture, amount, and use.</p> <p>Identify and name aloha plants.</p> <p>Identify and name plants in garden.</p> <p>Create a list of crops grown and food gathered in your area.</p>	<p>Define agriculture.</p> <p>Define and illustrate traditional field systems such as Kona and Kohala.</p> <p>Compare and contrast traditional and modern land-cultivation methods.</p>	<p>Create a timeline of agricultural history in your community.</p> <p>Introduce and research <i>Native Planters</i>.</p> <p>Visit local traditional and current agricultural sites.</p> <p>Analyze and discuss traditional and modern agriculture practices, resources, plants, and people in your area.</p> <p>Steward plants of historical relevance to your area.</p>	<p>Describe how cultural and ecological resources have shaped local land use.</p> <p>Describe how human activity has impacted local agricultural resources.</p> <p>Propagate and plant Polynesian-introduced, indigenous, and endemic plants from your region.</p>	<p>Walk or hike within your ahupua’a and identify agricultural resources and current land uses.</p> <p>Identify, propagate, grow, and use indigenous and endemic plants from your region (e.g., cordage).</p> <p>Conduct an oral history interview with long-standing farmers and practitioners in your community and share with an audience.</p>

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Geography and Direction	Direction and map orientation	<p>Identify mauka/makai; the four cardinal directions,</p> <p>Explain position words (in front of/behind, next to, right/left, front/back, above/below, over/under etc.)</p>	<p>Direction game</p> <p>K2: 1-10 Learn a verse, finger play or song about direction.</p> <p>K2: 1-10 The Position Word Scavenger Hunt</p> <p>K2: 1-11 Create a simple map of the school garden, exchange maps and locate landmarks.</p> <p>Make a map of a single garden bed and place it on a larger garden map of the entire garden.</p> <p>Teacher models direction words.</p>	<p>Explain orientation and direction.</p> <p>Apply understanding of orientation and direction to planting.</p>	<p>Point and trace the sun's path in the garden.</p> <p>Identify sun's direction and create a planting map appropriate to crops' needs.</p> <p>Use words like mauka/makai, ākau/hema, regional and geographical markers to describe directionality. Model understanding by facing these directions in the garden.</p> <p>Design and present a garden map incorporating directionality.</p>	<p>Know the cardinal directions and where the celestial bodies rise and set.</p> <p>Point towards North, South, East, West (ākau, hema, hikina, komohana).</p>	<p>Standing in your school garden, identify the cardinal directions and locate and name major geographical features using cardinal directions.</p> <p>Point and trace the sun's path in the garden; predict seasonal changes.</p> <p>At any given location, be able to turn and face your body towards "your personal home."</p>
	Major geographical features	<p>Identify and name geographical features you can see from the school garden.</p>	<p>Observation game: What do you see when you look to the north, south, etc.? Have students use their bodies to describe location of geographical features.</p> <p>Create large classroom map; include place names and geographical features.</p> <p>Create a word bank to describe geographical features from your school.</p>	<p>Create qualitative and quantitative maps.</p> <p>Identify districts, mountains, regions, and major archaeological and geographic features.</p> <p>Explain how geographic features affect growing conditions in the garden.</p>	<p>Create and interpret maps that identify districts, regions, and major geographical features.</p> <p>Recognize and name geographical features in your area.</p> <p>Create a qualitative map of where the garden is within a district.</p> <p>Identify a variety of geographical features that influence the garden</p>	<p>Name and identify important geographical features that are pertinent to your garden classroom using both Hawaiian and English names.</p> <p>Locate the garden on a map using latitude and longitude.</p> <p>Compare and contrast what can be seen from the garden with major geographical features on a map.</p>	<p>From your garden, be able to locate and identify major geographical features that impact your region.</p> <p>Within your garden, identify organisms' response to geographical features (e.g., tree growth impacted by wind patterns resulting from geographical features).</p> <p>Locate the garden on a map using latitude and</p>

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					<p>environment.</p> <p>Analyze ahupua’a map, and reproduce map in simpler form.</p> <p>Label the map to demonstrate directionality and geographical features.</p> <p>Compare and contrast the simple ahupua’a map with other maps.</p>	<p>Create a map of the garden, including major geographical features and a compass rose.</p>	<p>longitude.</p> <p>Create a map of the garden and identify areas that would be best for specific uses (e.g., windbreak, crop area, fruit tree orchard, nursery).</p> <p>Using prior and new knowledge, assess existing garden space for improvement based on geographical features.</p>
Values	Relationship of family to “place”	Identify and describe the value of the school garden.	<p>Describe or draw the school garden.</p> <p>Describe or draw your favorite plant.</p> <p>Describe or draw your favorite job in the garden.</p>	Describe how the ‘āina sustains your family, school, and community.	Create a collection of family stories that describe the relationship between humans, plants, and land.	Demonstrate an understanding of the interrelationship between the health of the land and natural resources with the health of the community and families in it.	Research the history of the school community regarding land use.
	School values	Incorporate school values into the garden.	<p>Define personal values.</p> <p>Create classroom values.</p> <p>Identify potential school values (e.g., being pono).</p> <p>Identify and discuss ways students can model values in the garden classroom.</p> <p>Create garden agreements.</p>	Incorporate school values into the garden.	Identify how the school values are reflected in garden work and activities.	Incorporate school values into the garden.	<p>Identify how the school values are reflected in garden work and activities.</p> <p>Incorporate school values into garden practices.</p>

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	Hawaiian values	Practice and describe aloha ‘āina, mālama ‘āina.	<p>Explain and model behaviors, including aloha ‘āina, mālama ‘āina, asking permission, taking only what you need, leaving enough to make more, reducing waste, etc.</p> <p>Perform, illustrate, or write stories that use the sayings from ‘Ōlelo No‘eau.</p>	<p>Practice Hawaiian values.</p> <p>Explain how Hawaiian values relate to the garden.</p> <p>Explain how the kapu system can be a model for resource management.</p>	<p>Identify and give examples of Hawaiian values at work in the garden.</p> <p>Incorporate Hawaiian values and ‘ōlelo no‘eau as agreements and assessments in the garden.</p> <p>Investigate Hawaiian resource management practices and compare to modern practices.</p> <p>Read mo‘olelo about ancient times and relate kapu system to natural resource management.</p> <p>Investigate indigenous resource management practices and compare and contrast to modern practices.</p> <p>Develop a logical argument that indigenous resource management can or cannot be incorporated today.</p>	<p>Apply the principles and practices of aloha ‘āina, mālama ‘āina, kuleana, lokahi, etc. in the garden on a regular basis.</p> <p>Appraise the impact of practicing these values regularly on self, garden, and community.</p>	Use the language and values of aloha ‘āina, mālama ‘āina, kuleana, and lokahi to inform daily garden practices and activities.
	Best practices	Create and model garden agreements to ensure a respectful, safe, and cooperative learning environment.	<p>Create a garden protocol to be performed daily when entering the garden.</p> <p>Create or learn a verse, song, or oli to ask permission to enter the</p>	<p>Create and model garden agreements to ensure a respectful, safe and cooperative learning environment.</p> <p>Respect and adhere to codes of conduct for your</p>	<p>Create a garden protocol to be performed daily when entering the garden.</p> <p>Create garden agreements using traditional Hawaiian and</p>	<p>Create and model garden agreements to ensure a respectful, safe, and cooperative learning environment.</p> <p>Respect and adhere to codes of conduct for your</p>	<p>Create a garden protocol to be performed daily when entering the garden.</p> <p>Create garden agreements using traditional Hawaiian and</p>

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			<p>garden.</p> <p>Create garden agreements using traditional Hawaiian and western value words.</p> <p>Practice recording observations and measurements for a garden log.</p> <p>Follow information from Best Practices on the Hawaii Farm to School and School Garden Hui Food Safety Poster.</p> <p><i>* See Appendix: Hawaiian Cultural Values and General Learner Outcomes</i></p>	<p>garden classroom.</p> <p>Describe the consequences of personal actions in the garden.</p> <p>Maintain garden data records.</p>	<p>Western value words.</p> <p>Participate in recording daily observations and measurements for a garden log.</p> <p>Follow information from Best Practices Poster - Hawaii Farm to School and School Garden Hui (HFSSGH)</p>	<p>garden classroom.</p> <p>Describe the consequences of personal actions in the garden.</p> <p>Maintain garden data records.</p>	<p>Western value words.</p> <p>Create signage of garden agreements.</p> <p>Participate in recording daily observations and measurements for a garden log.</p> <p>Follow information from Best Practices HFSSGH poster.</p>

The Living Soil–The Living Plant: We Are All Interconnected and Related

Theme 2: Scope and Sequence - Grades K–8

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
Scientific Inquiry	Ability to make observations, inquiry, collect and interpret data, make conclusions	<p>Make Observations.</p> <p>Ask questions.</p> <p>Collect data.</p> <p>Interpret data.</p> <p>Make conclusions.</p>	<p>What is soil made of?</p> <p>Observe garden soil.</p> <p>Ask questions.</p> <p>Explore and classify the parts of soil.</p> <p>Where do these soil parts come from?</p> <p>Can we recombine them to make soil?</p>		<p>Set up a garden experiment to test the effect of soil types on plant growth.</p>		<p>6th grade: Guided two minutes of silent observation. “I notice_____.” I wonder_____.” From this come up with a testable question. Students share out.</p>
	Engineering design	<p>Design, build, and test various solutions to simple garden problems in infrastructure.</p>	<p>Design a solution to a problem identified in the garden. Discuss possibilities, create a small model, build the best solution, test.</p>		<p>Identify problems in the garden, (e.g., drainage, irrigation) and design solutions to the problem (e.g., divert water).</p>		
The Living Soil	Describe characteristics and components of living soil	<p>Explain how soil is created.</p> <p>Describe differences among soil samples.</p> <p>Identify living and nonliving components of soil.</p>	<p>Collect soil samples from five different areas of the school garden.</p> <p>Describe the different types of soil using all five senses.</p> <p>Compare soil samples to each other.</p> <p>Sort and classify living and nonliving soil components.</p> <p>Create a list of words that describe collected soils.</p> <p>Illustrate, in words or drawings, findings of soil exploration activity.</p> <p>Recombine samples to make soil.</p>	<p>Investigate and identify general components of living soil.</p> <p>Analyse and classify various types of soil found in Hawaii.</p>	<p>Observe compost pile and identify moisture level, temperature, (brown) carbon:nitrogen (green) ratio.</p> <p>Sort, classify, identify, and represent components of soils from different garden beds. Include particle size, clay, silt, loam, and living things.</p> <p>Perform and analyse mason jar soil test.</p> <p>Create soil forms such as balls, ribbons, snakes, etc. to understand soil components, texture, and properties.</p> <p>Introduce basic soil chemistry: Use soil test</p>	<p>Compare and contrast the abiotic and biotic factors of the soil. Explain how abiotic and biotic factors relate to other systems.</p> <p>Recognize and classify sand, silt, clay, and loam.</p> <p>Justify and describe the proportional relationships of soil components.</p>	<p>Using a quadrat, hand lens, and/or magiscope describe and draw soils from different areas of school grounds. Make qualitative and quantitative observations of collected samples.</p> <p>Perform soil percolation and absorption test to analyze porosity and components of soil.</p> <p>Introduce basic soil chemistry: Use soil test kit or Vernier probes to analyze nitrogen, phosphorus, potassium (K), and pH of soil samples from school garden.</p> <p>Analyze soils using the clump test.</p>

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					<p>kit or Vernier probes to analyze nitrogen, phosphorus, potassium (K), and pH of soil samples from school garden.</p> <p>Discuss that there are minerals in the soil. Investigate how plants show deficiencies (lack) of the mineral (e.g., iron-deficient plants have younger leaves yellowing, calcium-deficient plants have blossom end rot, etc.).</p>		<p>Create optimum garden soil health using test results and amendments.</p> <p>Construct loamy soil necessary for optimum plant growth.</p>
	Identify organisms in the soils and their functions and interrelationships	<p>Describe soil as a living medium.</p> <p>Describe how living organisms and organic matter contribute to soil health.</p> <p>Recognize and draw or explain the difference between vertebrates and invertebrates.</p>	<p>Investigate worms living in soil and compost systems.</p> <p>Create and maintain a worm bin to investigate the role worms play in soil fertility.</p> <p>Sift finished compost (or garden soil) and explore, draw, and describe the organisms found in the soil.</p> <p>Appendix: Banana Slug String Band, <i>The FBI is on the Scene</i>.</p>	<p>Identify and illustrate fungi, bacteria, and invertebrates.</p> <p>Describe, compare, and contrast the roles fungi, bacteria, and invertebrates play as decomposers, recyclers, and contributors of soil nutrients.</p> <p>Illustrate fungi, bacteria, and invertebrates found in soil samples.</p>	<p>Observe compost pile and identify living (biotic) and nonliving (abiotic) factors. Collect and record data.</p> <p>Observe compost pile over time, identify presence of living organisms throughout the compost cycle. Collect and record data.</p> <p>Sift finished compost or garden soil. Use hand lens to identify various decomposers such as shredders, predators, bacteria, and fungi. Collect and record data.</p> <p>Use visual material such as a field guides or videos to show fungi, bacteria, and invertebrates.</p>	<p>Cite specific evidence for how microbes affect plant growth and overall health of the soil.</p>	<p>Design an experiment to compare plants grown in sterilized soil and compost-enriched soil.</p> <p>Apply medium rich in microorganisms such as worm castings or EM Bokashi to garden beds and observe plants' response.</p> <p>Collect and culture microbe samples using an agar petri dish.</p> <p>Using a microscope, analyze growth to distinguish between "threads" (mycelium) of fungus and the circular "clumps" (colonies) of bacteria.</p> <p>Construct a Berlese funnel to identify macroorganisms in the</p>

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					<p>Describe the soil organisms fungi, bacteria, and invertebrates in terms of the relationship of their structure to their function (e.g., mandibles - shredding leaves, burrowing in soil - opens soils for oxygen, etc.).</p> <p>Draw, act, sing, or play a guessing game about the structure and function.</p> <p>Appendix: Banana Slug String Band, <i>The FBI is on the Scene</i>.</p>		soil.
	Explain how soils are created	<p>Identify and be able to classify living and nonliving components of soil.</p> <p>Describe how living and nonliving components of soil became part of the soil.</p>	<p>Collect soil samples from various places around school.</p> <p>Sort and classify the components of the soil samples into living and nonliving. Discuss their origins.</p> <p>Experiment with combining individual soil components to create soil.</p> <p>Investigate origins of Hawai'i's soils through the story of the 'ōhi'a.</p> <p>See Appendix (story of 'ōhi'a)</p>	Understand that weather, geologic forces, and human activity create different soil types.	<p>Create a shake jar test (soil column) and identify components of soil (e.g., rocks, clay, sand, silt, humus).</p> <p>Observe and identify signs of erosion caused by water or wind in the garden.</p> <p>Use quadrats to compare and contrast a compost pile in the garden with a decomposing area in a forest, woods, beach, etc.</p> <p>Design a model to demonstrate a solution to erosion.</p> <p>Ahupua'a field trip to</p>	<p>Summarize how weather transforms rock (the parent material) into soil.</p> <p>Categorize the inorganic and organic components of soil.</p>	<p>Measure, compare, and contrast the layers in soil horizons in different areas of the garden.</p> <p>Use quadrats to carefully observe the topsoil and identify its component. Collect and record data.</p> <p>Identify an area of erosion. Measure the length, width, and depth of the identified area and calculate the volume of topsoil lost.</p> <p>Design, implement, and test a solution to prevent erosion.</p> <p>Monitor and report</p>

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					<p>identify signs of erosion and weathering, identify composting in nature.</p> <p>Write a legend or story about the origin of Hawai'i's soil.</p>		<p>intervention tactics over time.</p> <p>Evaluate efficacy of erosion intervention tactics.</p>
	Understand how to make a soil mixture for nursery and seed starting	Recognize characteristics of potting mixes.	<p>Observe potting mix and garden soil.</p> <p>Germinate seeds in garden soil and potting mix. Collect and record data.</p> <p>Compare and contrast collected data. Summarize observations.</p> <p>Create a soil mixture made of ½ compost and ½ potting soil. Transplant seedlings into soil mixture.</p> <p>Discuss and explain why transplants need compost.</p> <p>Describe the differences between soils located beneath a tree and in a vegetable garden bed.</p>	Understand components of healthy soil for use in plant propagation.	<p>Create nutrient-rich soil: Add soil amendments on hand such as crushed coral, worm castings, etc. to compost or potting soil.</p> <p>Create an experiment to investigate soil fertility: Start seeds in or transplant seedlings into amended soil, straight compost, and potting soil. Observe and collect data.</p> <p>Compare and contrast collected data.</p> <p>Create a soil recipe book of soil mixtures for school and home gardening.</p>	<p>Distinguish between different planting mediums for use in seed starting, propagation, and transplanting.</p> <p>Create different planting mediums for use in seed starting, propagation, and transplanting out of materials on hand.</p>	<p>Create nutrient-rich soil: Add soil amendments on hand such as crushed coral, worm castings, etc. to compost or potting soil.</p> <p>Create an experiment to investigate soil fertility: Start seeds in or transplant seedlings into amended soil, straight compost, and potting soil. Observe and collect data.</p> <p>Compare and contrast collected data.</p> <p>Construct a healthy growing environment for seedlings and plants.</p> <p>Prepare and amend garden beds for planting crops.</p> <p>Prepare and amend areas for planting perennials such as fruit trees.</p>

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							Compare and contrast practices for preparing soils for annuals vs. perennials.
	<p>Know and describe the oxygen, nitrogen, and carbon cycles in the soil (e.g., biogeochemical)</p> <p>(Also in Theme 4)</p>	<p>Identify and describe green (nitrogen), brown (carbon), oxygen, and moisture in the soil cycle.</p>	<p>Build a compost pile: Identify green material (nitrogen) and brown material (carbon), oxygen, and moisture.</p> <p>Describe and explain how carbon, nitrogen, oxygen, and moisture make compost.</p> <p>Apply finished compost to garden beds and observe the results.</p> <p>Appendix: Video: <i>Dirt Made My Lunch</i> by The Banana Slug String Band.</p>	<p>Record observations about oxygen and carbon in healthy soil.</p> <p>Hypothesize and prove the presence of oxygen and carbon in healthy soil.</p> <p>Compare and describe carbon and oxygen levels in various soil types.</p>	<p>Build, maintain, and employ aerobic (with oxygen) compost systems and identify browns (carbon) and greens (nitrogen) sources.</p> <p>Over span of time, collect and record qualitative and quantitative data from compost systems, including temperature and moisture levels, and senses.</p> <p>Perform a shake jar test. Identify humus and bubbles as evidence of oxygen in soil.</p>	<p>Demonstrate or explain how soil aeration and organic material impact plant growth.</p>	<p>Build anaerobic (without oxygen) and aerobic (with oxygen) compost systems, collect temperature data, and observe change over time, using visual and olfactory cues.</p> <p>Compare and contrast compost piles using different ratios of carbon, nitrogen, moisture, and oxygen.</p> <p>Aerate garden beds to add oxygen for the health of fungi, bacteria, and insects.</p> <p>Add water, carbon, and nitrogen (stable organic material) to improve plant health and support micro and macroorganisms.</p>
Living Plants	<p>Explain the relationship between weeds and soil</p> <p>Identify local weeds</p> <p>Explain pioneer plant species</p>	<p>Identify and give examples of common weeds in the garden or school environment.</p> <p>Describe the advantages and disadvantages of common weeds.</p> <p>Explain the role weeds</p>	<p>Go on a weed identification walk in the garden.</p> <p>Locate common weeds in the garden.</p> <p>Learn the names of and illustrate common garden weeds.</p>	<p>Identify and employ various soil building strategies such as mulching and cover cropping in the garden.</p>	<p>Conduct a weed identification walk to learn the names of common garden weeds.</p> <p>Set up a cover crop prior to summer break to restore nutrients. Assess cover cropping as an effective method of weed</p>	<p>Classify weed vs. non-weed in specific environments.</p> <p>Explain how weeds can be used as a garden resource.</p> <p>Design a use for weeds as a garden resource.</p>	<p>Conduct a weed identification walk. Locate and learn the names of common garden weeds.</p> <p>Use weeds as resources for compost nitrogen enrichment.</p> <p>Recognize and identify</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
		play in soil health.	<p>Investigate the role of weeds in soil health (e.g., identify where weeds grow to cover bare soil).</p> <p>Sort and classify common weeds by variety, leaf size, etc.</p> <p>Chop and drop weeds, add to compost, or make tea from weeds.</p> <p>See Appendix.</p>		<p>control/prevention.</p> <p>Locate volunteer weed plants in the garden. Explain their impact, role, and function in the garden.</p> <p>Explain how weeds impact surrounding plants. Describe advantages and disadvantages of weeds.</p> <p>Find and use weeds that are not seeding as a green (nitrogen) layer in the compost pile.</p>		<p>noxious weeds, such as weed seeds, in the garden that would contaminate compost.</p> <p>Design and test strategies for managing noxious weeds in your garden.</p>
	<p>Describe the life cycle of a plant</p> <p>Explain structure and function of plant parts</p>	<p>Identify and draw the structure and function of the six plant parts.</p> <p>Identify and describe what plants and animals need to survive.</p>	<p>Grow a plant from seed to seed: observe, measure, collect, record, or graph growth.</p> <p>Identify and describe the stages of the life cycle. Identify and describe or draw six plant parts.</p> <p>Learn the Six Plant Part Song (See Appendix).</p> <p>Grow and prepare a salad using each of the six plant parts.</p> <p>Use the United States Department of Agriculture’s Fresh Fruit and Vegetable Program’s weekly snack to identify and explain the edible parts of fruits and vegetables.</p>	<p>Predict and perform seed germination, seed collection, and seed saving.</p>	<p>Grow a plant from seed to seed: observe, measure, collect, record, or graph growth.</p> <p>Design and conduct an experiment about seed germination in different conditions.</p> <p>Harvest a variety of seeds and compare structure and function of different seeds.</p> <p>Create a written or drawn journal that explains the life cycle of a plant and describes a plant’s parts and structures.</p> <p>Grow ipu or pumpkin. Identify male and female aspects of reproductive parts.</p>	<p>Identify and describe plants based on their characteristics.</p> <p>Recognize and identify which life cycle stage the plant is in based on its structures.</p>	<p>Categorize seeds and plants into monocots and dicots.</p> <p>Identify the six plant parts (roots, stems, leaves, flowers, fruits, and seeds).</p> <p>Describe the role plant parts play in plant growth and reproduction.</p> <p>Identify reproductive parts of plants. Explain the reproductive cycle of plants.</p> <p>Create a design brief for a plant: select a parent plant for specific qualities, and state specific argument for selection.</p> <p>Conduct a seed exchange with the plant’s</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
					Dissect a bean seed. Identify various parts of the seed. Dissect a corn seed. Identify various parts of the seed.		seeds. Compare and contrast plant adaptations and methods of seed dispersal.
	Understand and explain photosynthesis	Explain the role the sun plays in a plant's ability to make its own food.	Stand in the garden and feel the sun. Discuss, observe, and identify the energy (sunlight) that plants. Play Photosynthesis Tag (see Appendix). Design an experiment that demonstrates the effect of sunlight on plants. Comparing plants grown with and without sunlight. Introduce photosynthesis through story.	Develop a model to describe and summarize photosynthesis. Explain or prove through experiment design how plant parts enable photosynthesis.	Cover up a plant part to prevent sunlight from reaching the leaf. Observe what happens. Conduct a seed germination experiment in light vs. dark. Make predictions about what seeds need during germination. Make predictions about what plants need to grow. Draw a picture or create a model to explain photosynthesis. Introduce chlorophyll.	Categorize the inputs and outputs of photosynthesis.	Recognize seasonality in the garden and how it affects the plant's ability to photosynthesize. Design an experiment to demonstrate the effect different quantities of light have on the growth and development of seedlings. Set up and observe transpiration bags. Measure the volume of water collected from different plants and correlate to surface area of a leaf.
	Understand how to propagate and grow plants	Explain germination, propagation, and transplanting as elements of plant growth.	Experiment sowing seeds directly into garden soil and into pots. Observe, compare, and chart days to germination, flowering, and fruiting. Transplant potted seedlings into garden soil. Plant via vegetative	Classify plants not propagated by seed. Apply propagation strategies to a variety of plants.	Read a seed packet and apply information to practices. Propagate a variety of plants using different methods, such as germination, vegetative (asexual) propagation, grafting, and air layering. Observe how different plants in the garden or nature reproduce.	Design optimal conditions for germinating and growing plants.	Read a seed packet and apply information to practices. Design and conduct an experiment about resource availability (water, sun, nutrients, etc.) and its effect on the germination rate of seeds (sexual reproduction). Design and conduct an experiment about

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			<p>propagation (kalo, banana, sugar cane, sweet potato, or pineapple).</p> <p>Explore resprouting plants from pieces (celery stalk, green onion bottoms, carrot top, sweet potato).</p>		<p>Identify and discuss how plants have adapted to conditions by utilizing appropriate propagation strategies.</p> <p>Identify propagation structures exhibited by plants under various conditions (e.g., stress induces flower/seed production, 'uala stem in contact with soil and water will produce roots).</p> <p>Prepare cuttings to share with community members.</p>		<p>resource availability (water, sun, nutrients, etc.) and its effect on the growth rate of cuttings (asexual propagation).</p> <p>Propagate a variety of plants using different methods, such as germination, vegetative (asexual) propagation, grafting, air layering.</p>
	Recognize and identify the differences among Polynesian-introduced, endemic, and indigenous plants	<p>Identify and name main forest trees (koa, 'ōhi'a) and canoe crops (banana, kalo, 'uala, kō, 'ulu, 'olena, ti leaf)</p> <p>Recognize that plants have arrived at different times in different ways (e.g., waves, wind, and wings).</p>	<p>Define introduced, endemic, and indigenous in terms of plants.</p> <p>Conduct a guided garden walk and identify introduced, endemic, and indigenous plants within the school environment.</p> <p>Conduct a biodiversity scavenger hunt. See Appendix.</p> <p>Introduce how seeds are dispersed through wind, water, wings, and animals. Draw or explain seed shapes.</p> <p>Investigate how plants arrived in Hawai'i.</p> <p>Harvest and prepare native plants for a craft,</p>	<p>Identify and classify endemic, indigenous, and Polynesian-introduced plants.</p> <p>Explain how various plants have different practical uses and applications.</p>	<p>Observe and identify how plants travel, specifically how plants arrived in Hawai'i, an isolated place, by wind, water, or animal.</p> <p>Explain how Hawai'i is the endemic species capital of the world.</p> <p>Conduct a guided garden walk; identify introduced, endemic and indigenous plants on campus, discuss how the plant got to Hawai'i (wind, water, wings).</p> <p>Create signage to distinguish native plants on campus; create a map of native plants on campus.</p>	<p>Identify a minimum of five of each: Polynesian-introduced, indigenous, and endemic plants</p>	<p>Conduct a guided garden walk; identify introduced, endemic, and indigenous plants.</p> <p>Plant and propagate Polynesian-introduced, indigenous, and endemic plants in the garden.</p> <p>Harvest and prepare native plants for a craft, cordage, food, medicine, or beverage (e.g., kapa, lei, etc.).</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			cordage, food, medicine or beverage (e.g. kapa, lei, etc.).		<p>Define terms endemic, indigenous, and Polynesian-introduced.</p> <p>Create a meal with Polynesian-introduced food crop.</p> <p>Harvest and prepare native plants for a craft, cordage, food, medicine or beverage (e.g., kapa, lei, etc.).</p>		
	Understand inheritance, genetic variation, and biodiversity in plants	Observe differential traits of varieties of a plant species.	<p>Sort, classify, and count different traits among multiple varieties within a particular plant species (e.g., beans, lettuce).</p> <p>Generate questions about the variations in the garden.</p> <p>Hypothesize explanations of why variations happen.</p> <p>Observe how a young plant is like, but not exactly like, the parent plant.</p> <p>Locate plants in the garden that can be divided off the parent plant and harvest keiki. Describe or draw how these plants resemble their parents.</p>	<p>Distinguish genetic and inherited differences in plants.</p> <p>Compare and classify how biodiversity influences survival.</p>	<p>Identify examples of genetic variation in the garden (e.g., pigeon pea, corn, lettuce, beans, kalo).</p> <p>Sort, classify, and count different traits among multiple varieties within a particular plant species (e.g., beans, lettuce, or tomatoes).</p> <p>Discuss how and why the variation happens.</p> <p>Compare and contrast color, leaf shape, and taste of several kalo and/or sweet potato varieties.</p>	<p>Investigate the different methods of plant propagation (e.g., seeds, cuttings, air layering, etc.)</p>	<p>Sort, classify, and count different traits among multiple varieties within a particular plant species (e.g., beans, lettuce, or tomatoes).</p> <p>Discuss how and why the variation happens.</p> <p>Develop testable questions from these observations.</p> <p>Compare color, leaf shape, and taste of different taro (kalo) varieties and/or sweet potato ('uala) varieties.</p> <p>Identify examples of genetic variation in the garden (e.g., pigeon pea, corn).</p> <p>Propagate plants asexually and sexually.</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
Soil Fertility	Understand, build, and use compost systems	Describe the components of composting (green and brown, decomposers, air, water, time).	<p>Identify and collect green (nitrogen) and brown (carbon) materials for compost pile.</p> <p>Build, tend, and record observations of a compost pile over time.</p> <p>Observe nature’s composting (e.g., a rotting apple, leaves decomposing under a tree).</p> <p>Build and tend a classroom or garden worm bin.</p> <p>See Appendix: How to Compost Guide.</p>	<p>Construct, retrieve, and layer green (nitrogen) and brown (carbon) in composting systems.</p> <p>Explain how green (nitrogen) and brown (carbon) provide various nutritional elements for optimal fungi, bacteria, and invertebrate activity.</p> <p>Connect vermiculture, soil amendments, and healthy layering to soil creation and plant nutrition uptake.</p>	<p>Build a compost pile with green (nitrogen) and brown (carbon) layers in the proper ratios.</p> <p>Build and maintain several different compost systems such as aerobic, anaerobic, compost bins, compost pallets.</p> <p>Observe a compost pile. Turn and record moisture, temperature, and pH changes over time. Use a compost log to record data.</p> <p>Determine when a compost pile is finished and ready for use (i.e., temperature is stable, abundance of macro- and microorganisms).</p> <p>Discuss the importance of compost and create a drawing, poem, play, or song about compost and its creation.</p>	<p>Construct and maintain healthy compost systems and apply to the garden (e.g., vermiculture, aerobic, anaerobic).</p>	<p>Using proper ratios of nitrogen to carbon and water to air-build an aerobic compost pile.</p> <p>Observe a compost pile. Turn and record moisture, temperature and pH changes over time. Use a compost log to record data. Determine when a compost pile is finished and ready for use (i.e., temperature is stable).</p> <p>Determine when a compost pile is finished and ready for use (i.e., temperature is stable, abundance of macro- and microorganisms)</p> <p>Use compost in the garden. Estimate, using buckets, the volume of compost and/or mulch required to create balanced soil.</p> <p>Build and tend a classroom or garden worm bin.</p>
	Investigate, analyze, and apply natural soil fertility systems	<p>Explain how compost enriches the soil and feeds plants.</p> <p>Explain that mulch protects, cools, and retains moisture in the soil.</p>	<p>Apply finished compost and/or vermicompost to the garden. Make observations and discuss process.</p> <p>Investigate, identify, and gather different materials from the nearby environment and use to mulch around garden</p>	<p>Construct, retrieve, and layer green (nitrogen) and brown (carbon) in composting systems.</p> <p>Explain how green and brown provide various nutritional elements for optimal fungi, bacteria, and invertebrate activity.</p>	<p>Sift finished compost and make observations.</p> <p>Sort vermicast from red wigglers and/or Indian blue worms.</p> <p>Apply compost created from the different compost systems to garden beds.</p>	<p>Recognize and integrate soil fertility systems for optimal plant growth.</p> <p>Explain how/why to apply amendments in plant growing cycles.</p>	<p>Sift finished compost and make observations.</p> <p>Sort vermicast from red wigglers and/or Indian blue worms</p> <p>Use ratios to make correct dilutions of worm/compost teas, ash, etc. as a soil amendment.</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			<p>plants.</p> <p>Identify and grow plants that make good mulch sources.</p> <p>Observe and record temperature of mulched and un-mulched soil.</p> <p>Grow a plant in amended (with compost) and non-amended soils; record observations and formulate questions based on observations.</p>	<p>Connect vermiculture, soil amendments, and healthy layering to soil creation and plant nutrition uptake.</p>	<p>Grow the same crop in the garden beds. Compare and contrast the plants' growth in the different media.</p> <p>Identify mulch (brown/carbon) sources on campus.</p> <p>Identify human discards appropriate for mulch, weed cover, and/or brown (carbon) layer in compost (e.g., newspaper, cardboard, shredded paper).</p> <p>Compare and contrast the condition of trees with and without mulch.</p> <p>Mulch on and between beds to conserve water and prevent weeds.</p> <p>Use ratios to make correct dilutions of worm/compost teas, ash, etc. as a soil amendment.</p>		<p>Use compost and amendments as a part of bed prep.</p> <p>Mulch on and between beds to conserve water and prevent weeds.</p>
	Understand decomposition	<p>Explain that decomposition includes organic materials, air, water, organisms, and time.</p>	<p>Build, turn, and sift a compost pile and observe decomposition.</p> <p>Use eyes and magnifying glass to conduct a visual investigation of fungi, bacteria, and invertebrates in compost.</p> <p>Create a story in which the compost pile is the ultimate resort getaway (ideal habitat) for fungi,</p>	<p>Understand that decomposition is one way that Nature cycles matter and energy.</p>	<p>Compare and contrast the volume of a compost pile that is turned and a pile that is not turned.</p> <p>Compare and contrast the temperature of a compost pile that is watered and a pile that is dry.</p> <p>Conduct a visual investigation of fungi, bacteria, and</p>	<p>Observe decaying organic matter and explain its role within the garden ecosystem.</p>	<p>Build and maintain a compost system to demonstrate the cycling of matter and apply to the garden.</p> <p>Measure the change in volume of a compost pile over time.</p> <p>Measure the temperature changes in a compost pile over time.</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			<p>bacteria, and invertebrates. Design the resort (habitat) to include the inhabitants' favorite foods, enough air, water, etc.</p> <p>The Banana Slug String Band video "The F.B.I. is on the Scene."</p> <p>Decomposition song (see Appendix).</p> <p>Observe decomposition of mulch on the soil over time.</p> <p>Experiment: Bury and dig up, to observe over time, the decomposition of organic and inorganic materials.</p>		<p>invertebrates in the wet/dry or turned/unturned compost using sight and a magnifying glass.</p> <p>Observe decomposition of mulch on the soil over time. Record data.</p> <p>Research decomposition rates, create a decomposition timeline (e.g., slippers, apple, styrofoam, glass, etc.)</p> <p>http://techalive.mtu.edu/mec/module10/EnergyFlow.htm</p>		<p>Collect and culture microbe samples using an agar petri dish. Using a microscope, analyze growth to distinguish between "threads" (mycelium) of fungus and the circular "clumps" (colonies) of bacteria.</p> <p>Construct a Berlese funnel to identify macroorganisms in the soil.</p>
Biodiversity and interdependence	Understand and describe how weather shapes the Earth and affects soil and plants	Explain how sun, rain, and clouds affect soil and plants.	<p>Observe changes in the garden after a weather event (rainfall, heavy wind, cloudy day).</p> <p>Investigate how air and soil temperatures changes with clouds and rainfall.</p> <p>Observe and discuss how plants are affected by rain, sun, drought, and temperature.</p>	Examine and summarize how weather and climate affects soil creation and shapes land formations.	<p>Observe geographical features at school.</p> <p>Create a model to replicate geographical features.</p> <p>Explain how weather shaped the geographical features.</p>	<p>Explain the effects of plants and weather on soil erosion.</p> <p>Explain the relationship between soil erosion and biodiversity.</p> <p>Explain how topsoil is necessary for supporting life on the planet.</p>	<p>Create a model using an apple to represent the Earth and show the relationship of topsoil to planet. Explain findings.</p> <p>Create a decomposition timeline using organic and inorganic items found in the garden and on school campus. Display in the garden.</p> <p>Identify areas in the garden that model the effects of water and wind on areas of soil with and without plants. Compare and contrast the areas in writing, orally, or through illustrations.</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
	Explain the importance of biodiversity within the garden environment	<p>Explain biodiversity in the context of a garden environment.</p> <p>Give examples of plant and animal biodiversity in the garden.</p> <p>Describe biodiversity in terms of plant and animal interdependence.</p>	<p>Define biodiversity.</p> <p>Conduct a nature walk on the school campus. Identify trees and plants and discuss them in terms of biodiversity.</p> <p>Draw or describe different types of seeds or leaves. Categorize seeds/leaves based on observations.</p> <p>Count and name the different types of trees students can see from the garden.</p> <p>Expand understanding of biodiversity: survey the garden and identify who/what lives in the garden. List and count discoveries. See Appendix.</p> <p>Describe biodiversity in the garden and on campus. Compare and contrast the two sites.</p>	Identify and distinguish biodiversity in a variety of natural contexts.	<p>Identify evidence of pests in the garden (e.g., holes in leaves, egg, etc.) and determine which organisms are responsible using a field guide (see Appendix for field guide).</p> <p>Classify organisms as pests or beneficial insects.</p> <p>Name beneficial insects based on their function (e.g. decomposers, pollinators, predators, shredders).</p> <p>Cultivate plants that attract beneficial insects.</p> <p>Research plant types that attract beneficial insects or deter pests.</p>	<p>Identify the components of a biodiverse system.</p> <p>Explain how biodiversity supports the overall health of the garden environment in terms of specific species and overall environmental resilience.</p>	<p>Practice Integrated Pest Management to maintain maximum biodiversity in the garden ecosystem.</p> <p>Identify evidence of pests in the garden (e.g., holes in leaves, egg, etc.). Determine which organisms are responsible.</p> <p>Using a field guide, investigate the life cycle of the pest and use this information to experiment with methods of control. (e.g., cabbage moth, little fire ant).</p> <p>Identify garden pollinators and beneficial insects and their host plants. Propagate, plant, and maintain these host plants in the garden.</p> <p>Use a quadrat, measure and record abundance and diversity of insects on “host” plants vs. grass or path.</p> <p>Build and apply healthy compost to garden beds.</p>
	Identify the function that beneficial organisms and pests play in the garden	Describe the roles of pests, pollinators, and predators in the garden system.	<p>Identify and draw common garden insects.</p> <p>Identify evidence of pests in the garden (e.g., holes in leaves, aphids on leaves).</p> <p>Identify garden pollinators</p>	<p>Identify beneficial insects and pests. Identify invasive species.</p> <p>Explain the importance of pollinators, predators, pests, and their relationship to companion planting.</p>	Experiment with companion planting.	<p>Identify the benefits of companion planting to maximize space, provide habitats, increase fertility, etc.</p>	Know the basic tenets of Integrated Pest Management and the importance of pollinators.

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			<p>and beneficial insects.</p> <p>Identify plants that attract pollinators and beneficial insects.</p> <p>Observe and ask questions about the roles of pests, pollinators, and predators in the garden system.</p> <p>Play the Pest-Pollinators and Predators Tag Game. See Appendix.</p>	<p>Define food web.</p>	<p>Observe the activity of birds, mammals, and invertebrates in the garden.</p> <p>Research and report on companion plants and how they function.</p> <p>Identify the producers, consumers, and decomposers in your garden.</p> <p>Illustrate the food web in the school’s garden to demonstrate key relationships.</p>		<p>biodiversity of the garden.</p> <p>Recognize plant stages and link to diversity of living organisms in the garden.</p> <p>Define and identify trophic levels within the garden ecosystem. Include producers (sun/soil/water/air); primary consumers (herbivores); secondary consumers; and tertiary consumers.</p>
	Demonstrate an understanding of the interrelationships between soil, plants, animals, humans, and the environment	<p>Describe the ways in which living things are connected.</p> <p>Describe the environments living things inhabit.</p>	<p>Explore plant relationships with companion planting. See Appendix.</p> <p>Investigate, observe, and identify plant/animal relationships in the garden.</p> <p>Draw a picture or describe with words one relationship.</p> <p>Observe and discuss the activity and interaction of birds, mammals, and invertebrates in the garden.</p> <p>Use the garden as a model to observe and identify how soil, plants, animals, insects, and humans interact; draw or describe one of these</p>	<p>Develop a model to describe the movement of matter and energy between compost, healthy soils, and optimal human health.</p>	<p>Conduct nature walk to identify and survey biodiversity on campus and in the garden; compare and contrast two sites.</p> <p>Compare a monocrop (e.g., a lawn or playing field) to the diverse environment in a garden through observations of the surrounding ecosystem.</p> <p>Use quadrats to survey abundance and diversity of organisms.</p>	<p>Know the role insects play as pollinators for food crops.</p> <p>Recognize the interrelationship between insects, plants, and other factors in the garden.</p> <p>Appraise the impacts of pesticide, herbicide, and commercial fertilizer use.</p>	<p>Compare and contrast transgenic, hybrid, and open-pollinated crops.</p> <p>Apply principles of seed saving to maintain biodiversity in your garden.</p> <p>Compare a monocrop to the diverse environment in a garden.</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			relationships.				
Garden Practices	Know how to prepare different planting areas for a variety of plant types	Demonstrate how to prepare a garden bed or a pot for planting a seed or plant.	<p>Prepare a bed for planting.</p> <p>Remove weeds, add amendments, smooth the soil with a rake. Add amendments.</p> <p>Fill pots with potting mix and plant seeds.</p>	Demonstrate how to transplant and direct seed with optimal soil amendments and conditions.		<p>Explain how to prepare a hole for tree planting. Use a soil profile to model positive and negative integers when planting a tree, on a vertical axis with ground level being zero.</p> <p>Explain how to prepare a planting bed: cultivate, amend, aerate, and shape.</p> <p>Demonstrate how to transplant crops into a prepared garden bed using best practices such as depth, root handling, time of day, and appropriate amounts of water.</p> <p>Read and follow directions on a seed packet.</p> <p>Demonstrate knowledge of vocabulary and concepts by planting seeds into a prepared garden bed at correct depth and spacing.</p> <p>Design an experiment to compare and contrast till/no till or monocrop/diversified crop planting. Evaluate the results.</p>	<p>Transplant crops into a prepared garden bed using best practices such as depth, root handling, time of day, and appropriate amounts of water.</p> <p>Read and follow directions on a seed packet.</p> <p>Demonstrate knowledge of vocabulary and concepts by planting seeds into a prepared garden bed at correct depth and spacing.</p> <p>Design and conduct an experiment to compare and contrast till/no till and/or monocrop/diversified crop planting. Evaluate the results.</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
	Demonstrate how to safely use, maintain, store and repair garden tools	<p>Identify and name garden tools.</p> <p>Demonstrate proper use, safety, and care of garden tools.</p>	<p>Learn the names of tools, how to use them safely and when to use them, how to clean them and put them away.</p> <p>Identify age-appropriate tools.</p>	<p>Demonstrate safe and competent use of shovels, hand trowels, clippers, and picks.</p> <p>Explain proper tool maintenance.</p>		<p>Demonstrate safe and competent use of shovels, hand trowels, clippers, and picks.</p> <p>Explain proper tool maintenance.</p>	

Nourishment: Feeding Our Mind and Body with What It Needs to Stay Healthy and Flourish
 Theme 3: Scope and Sequence - Grades K–8

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
Food Culture	Articulate relationships to food through stories and memories	Recognize that different individuals, families, and communities eat different foods.	<p>Keep food journal for one day.</p> <p>Draw or write about what you ate.</p> <p>Make stone soup in fall or winter or friendship fruit salad in spring as a class community.</p> <p>Share your favorite food stories or memories.</p> <p>Invite family or community members to share their food stories.</p>	<p>Recount stories around food and family food traditions.</p> <p>Draw conclusions about the relationships between food and family.</p>	<p>Interview a family member to create a family food story.</p> <p>Research food that was important in your family.</p> <p>Create a garden cookbook based on family food stories.</p> <p>Introduce a variety of garden food plants.</p> <p>Map origin and share cultural uses of plants.</p> <p>Invite family members to garden and to share food stories.</p>	<p>Critically evaluate how personal food choices are impacted and influenced by media, culture, community, peers, family and self.</p>	<p>Choose and grow foods in the garden that are important to students, their families, community and culture.</p> <p>Prepare and eat these foods in the garden. Record and share stories about these foods.</p> <p>Examine advertising techniques and find common examples of techniques used to sell food (e.g., cool characters, catchy slogans).</p> <p>Create slogans for food grown in the garden that advertise “nutrition.”</p>
	Understand how food traditions, values and celebrations affect food choices and community food systems	Give examples or identify family and ethnic food traditions.	<p>Conduct a family food interview with family member, friend, etc. Ask questions like, “What does your family traditionally eat?” Share with classmates.</p> <p>Invite family members to share traditions and sample foods.</p>	<p>Describe and compare a variety of food stories from a variety of cultures.</p> <p>Interpret the impact a family food tradition has on food choice and community.</p>	<p>Listen to a variety of food stories from a variety of cultures.</p> <p>Identify holiday meals among various students. Observe how holiday meals impact food choice and community.</p> <p>Process and prepare a plant-based traditional dish.</p> <p>Grow and prepare one traditional Hawaiian food crop.</p>	<p>Recognize how values shape eating habits and foods available in the community.</p> <p>Recognize the factors that shape food traditions such as seasonality, scarcity and abundance, and geographical resources.</p>	<p>Describe a food-based tradition in your family or community.</p> <p>Choose and grow foods in the garden that are traditionally important.</p> <p>Prepare and eat these foods in the garden.</p> <p>Record and share traditions about these crops.</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
					Harvest, compose a still life and watercolor a cornucopia.		
	Appreciate that food is place-based and that different regions around the world have distinct culinary attributes	<p>Identify which foods grow in Hawai'i.</p> <p>Explain that foods can be categorized in groups based on attributes (i.e. fruits/vegetables).</p>	<p>Conduct a garden walk to identify food plants.</p> <p>Sort and classify garden plants into food groups and identify their origin.</p> <p>Create a word bank of distinctly cultural foods in Hawai'i.</p> <p>Grow at least one food from each culture represented by students.</p>	<p>Explain what culinary cultures are and how they came to be.</p> <p>Give examples of culinary cultures.</p> <p>Explain how/why culinary culture is shaped by the foods grown in that region.</p>	<p>Conduct a survey about the culinary cultures represented by garden students.</p> <p>Grow simple gardens with cultural culinary food plants (e.g., Hawaiian, Filipino, Chinese, European, etc.).</p> <p>Categorize and map the culinary attributes of the cultures represented.</p>	<p>Compare and contrast foods from different locales.</p> <p>Identify distinguishing flavors and characteristics.</p>	<p>Propagate and plant different beds that represent cultural and regional foods in the garden.</p> <p>Compare and contrast how crops from different regions grow in your environment.</p>
	Recognize that foods can promote wellness and deter disease.	<p>What a food plant is and how it nourishes the body.</p> <p>Describe the differences between whole and processed foods such as refined and natural sugars.</p> <p>Explain "close to the source," and identify foods grown locally.</p>	<p>Define whole and processed foods. Eat a whole and a processed food such as an apple and applesauce. Describe the differences.</p> <p>Visit a farmers' market or produce section at a local grocery store. Create a list of whole and processed foods seen in both locations.</p> <p>Grow and make a healthy snack from the garden.</p> <p>Grow herbs for tea, seasoning, or first-aid.</p> <p>Discuss "close to the source" and identify</p>	<p>Examine the nutritional attributes of cultural culinary habits represented in a classroom.</p> <p>Infer that eating habits and diet choices directly affect physical and mental wellness, and disease prevention.</p>	<p>Identify and describe favorite food plants.</p> <p>Examine 'Aina Food Guide. Grow and taste a food from each of the 'Aina categories: protective foods, energy foods, body building foods, brain foods, and caution foods.</p> <p>Define "Close to Source" and provide evidence from the garden.</p> <p>Explore the link between nutrient dense foods and good health by evaluating student food logs.</p> <p>Make a poultice with</p>	<p>Connect what is eaten with emotional and physical states.</p> <p>Describe what wellness looks like.</p> <p>Describe the differences between whole and processed foods such as refined and natural sugars.</p> <p>Design a personal plan for daily food choices food that supports long-term health.</p> <p>Recognize the relation between nutrient dense and whole foods.</p>	<p>Taste, prepare, describe, and eat describe fresh foods in the garden.</p> <p>Identify and classify different taste profiles: sweet, sour, bitter, salty, umami.</p> <p>Identify and distinguish the qualities of fresh, whole foods from the garden.</p> <p>Research nutritional values of foods grown in garden and taste them.</p> <p>Compare, contrast and evaluate garden grown with frozen, canned and fresh, store-purchased</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			<p>locally grown foods.</p> <p><i>* See Appendix: Examine the `Aina Food Guide</i></p>		<p>comfrey, aloe, etc. and understand how garden products support and promote health.</p>	<p>Explain how time spent in the garden and growing food influences personal food choices.</p>	<p>produce.</p> <p>Explore relationship between exercise and foods eaten.</p> <p>Make herbal teas.</p>
Food Justice and Security	Recognize the social, economic and environmental components of food systems	<p>Explain that foods can be grown in a garden, in a container on a porch, and at a farm. Give examples of foods from each category.</p> <p>Explain that foods are purchased at farmers' markets, harvested from the forest and ocean, and traded with friends/family. Give examples of each category.</p>	<p>Grow a small garden of diverse crops in the ground and in containers.</p> <p>Record number of hours of student work; count and weigh harvest and waste; track number of students fed.</p> <p>Conduct a garden walk to identify food plants.</p> <p>Tour a local farm. Learn and discuss what is needed to bring a food crop from seed to market. Illustrate a simple food system based farm tour experience.</p> <p>Identify and list ways a family or the community acquires food in their region.</p> <p>Use and describe the cycle of how garden compost grows healthy plants.</p> <p>Visit a farmers' market and make a list of the foods sold at the market.</p>	<p>Explain agricultural practices of various culinary cultures represented in a classroom.</p> <p>Connect social, economic, and environment systems to culinary cultures.</p> <p>Design a model that investigates social, economic, and environmental systems within a culture's culinary system.</p> <p>Describe and analyze a simple and complex food system. Compare and contrast a school or home garden, a grocery store, and a farmers' market.</p> <p>Connect farmer's market and grocery store processes to garden grown foods.</p>	<p>Using school garden, farmers' market, and grocery stores:</p> <ul style="list-style-type: none"> Examine agricultural and culinary practices of various cultures represented in classroom. Calculate and analyze garden production from garden logs. Include planting and harvest data, weight and waste, and labor data. Identify patterns and present findings. Identify social, economic and environmental inputs needed to grow plants such as labor, natural, and financial inputs. Compare and contrast a garden task completed by manual labor versus a machine. Formulate questions about scale of production. Identify and model wise use of available and free resources such as compost, 	<p>Relate the components of your local food system.</p> <p>Recognize whole foods, and how and where to obtain them.</p>	<p>Compare and contrast the same food from garden, farmer's market, and grocery store.</p> <p>Compare garden grown foods with pre-packaged foods: Assess how far the foods traveled, the number of people involved in handling, and the economic and environmental impacts. Use all senses to appraise the quality.</p> <p>Calculate and analyze garden production from garden logs. Present findings.</p> <p>Recognize whole foods and identify where to obtain them.</p> <p>Analyze food from various sources including farmer's market, grocery store, and garden for impacts on social, economic and environmental systems.</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			Describe how and where the food comes from. Find examples of foraging and cultivating.		<ul style="list-style-type: none"> beneficial insects, etc. Draw a model of various food systems and include energy inputs and outputs. Compare and contrast various inputs in different environments needed to grow plants. 		
	Explain the energy inputs and outputs required by food systems	<p>Explain the energy inputs required for a garden system: human energy, sun, etc.</p> <p>Describe or illustrate how plants, animals and people get their energy.</p>		Create a map that depicts energy inputs and outputs for a local food system.		<p>Characterize differences between local and imported food crops.</p> <p>Explain various growing systems in regards to energy inputs and outputs.</p>	<p>Compare and contrast the same food from various sources.</p> <p>Compare garden grown foods with pre-packaged foods: assess how far the foods traveled, the number of people involved in handling, and the economic and environmental impacts. Use all senses to appraise the quality.</p> <p>Calculate and analyze garden production from garden logs. Present findings.</p> <p>Recognize whole foods and identify where to obtain them.</p> <p>Analyze food from various sources including farmer's market, grocery store, and garden for impacts on social, economic and</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
							environmental systems.
	<p>Understand how food systems, food justice, and food security contribute to food access, affordability and distribution.</p> <p>Understand the relationship between advocacy and policy as they relate to food justice and food security.</p>	<p>Explain what people and animals need to survive.</p> <p>Give examples and describe how to acquire foods needed to survive.</p> <p>Explain how to acquire fresh, whole foods.</p>	<p>Conduct a Food Drive & Grow a Row for the Food Basket.</p> <p>Grow food that students can take home to their family.</p> <p>Grow, eat, share, and sell what we eat to understand food security.</p>	<p>Define food justice and injustice.</p> <p>Define food security and insecurity.</p> <p>Identify Hawai'i food systems.</p> <p>Construct an argument about Hawai'i food systems and food security/insecurity.</p>	<p>Identify and examine global and/or local instances of food justice and injustice.</p> <p>Compare and contrast various sources of foods available for consumption such as gardens, food banks, markets, stores, and ocean or forest.</p> <p>Define "food map"; create a food map that represents students' home/community.</p> <p>Compare and contrast local grown food to imported foods such as local Ka'u oranges vs. Sunkist oranges.</p> <p>Design a barter system where garden resources are identified for exchange with other goods.</p> <p>Identify and give examples of food deserts.</p>	<p>Explain food and food production in terms of abundance, scarcity, and access.</p> <p>Formulate solutions for food insecurity.</p>	<p>Describe a time in which food would be safe to eat and available to feed individuals and community.</p> <p>Cultivate crops that represent food security in your community.</p> <p>Formulate a plan to use food from your school garden to contribute to food justice and security in your community.</p> <p>Explain how action, policy, and advocacy can influence food justice and security.</p>
	<p>Food is a resource: Identify and apply practices that eliminate and redirect food from waste systems</p>	<p>Identify where food waste comes from and goes to.</p> <p>Explain how to store foods.</p> <p>Identify and describe</p>	<p>Investigate what happens to discarded food at school and at home.</p> <p>Learn how and when fruits and vegetables are ripe and ready to eat.</p>	<p>Compare and contrast food waste.</p> <p>Identify practices that produce more or less food waste.</p>	<p>Examine a trashcan after lunch. Identify food waste (i.e. food waste audit).</p> <p>Identify practices that produce food waste.</p>	<p>Explain food waste and Model behaviors that reduce, eliminate, and redirect food from landfill systems.</p>	<p>Using 5 gallon buckets, determine volume and weight of food waste from lunch. Record data. Compare over time.</p> <p>Identify mean, median</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
		when to harvest fruits and vegetables.	<p>Weigh and recycle fresh fruit and vegetable scraps from school meals. Collect data and add to the compost pile in the school garden.</p> <p>Create and maintain a garden worm bin.</p> <p>Create a classroom bokashi composting system with 2 buckets. See Appendix KHF Lesson</p>	Identify local landfill systems.	<p>Identify local landfill and wastewater systems.</p> <p>Create a vermiculture system and utilize castings as fertilizer.</p> <p>Incorporate garden snack discards into garden compost system. Layer appropriate ratio of green/brown components.</p> <p>Collect data on volume of food discards in a classroom versus a school wide lunch program.</p> <p>Compare and contrast volume of food discards in a classroom versus a school wide lunch program</p>		<p>and mode of waste, and predict annual totals for school and individual students.</p> <p>Create, implement and evaluate a strategy that generates less food waste in your garden, classroom or cafeteria.</p> <p>Incorporate garden snack discards into garden compost system. Layer with appropriate ratios of nitrogen/carbon.</p> <p>Discuss how discards can become garden inputs connected to garden nutritional cycles.</p>
	Understand the economic value and ecological impact of a crop or product in your region	<p>Explain how one seed can turn into many, or one food can be turned into many different products.</p> <p>Explain how a garden can contribute to a family's economic health.</p>	<p>Plant, nurture, and harvest one bean seed. Describe how a single plant produces multiple seeds. Explain through illustration, journaling, and applying math extensions how one bean seed produces many.</p> <p>Grow one crop for a student farmers' market at school.</p>	Create a model or drawing demonstrating the cycle of a crop or product from seed to store.	<p>Create a model or drawing demonstrating the cycle of a single crop or product (e.g., bananas) from farm to table.</p> <p>Grow that product in the garden.</p> <p>Map local crop production and food sources.</p> <p>Make an agricultural map showing kinds of foods</p>	<p>Explain how gardening yields valuable resources. Do a cost analysis and simple ecological impact assessment of growing a crop in your garden.</p> <p>Describe how individual choice has an impact on the larger food system. Identify ways in which an individual can impact the food systems.</p>	<p>Grow crops to sell at a farm stand.</p> <p>Harvest, record, weigh, set price, and log garden crops.</p> <p>Compare and contrast prices across locations.</p> <p>Identify foods grown in various climate zones in your region.</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			Draw the foods grown in your regional area.		grown in your regional area.		
	Identify, design, and practice techniques that build resilient food systems such as seed saving, encouraging biodiversity, nutrient recycling and water conservation	Describe how home gardening, composting, and seed saving can lead to greater community food security. Identify other ways to promote community food security.	Conduct a Student Survey at the beginning and end of the year to identify fresh food sources at home. Choose and grow one crop to seed; save and replant seeds and/or propagate by division. Increase home food security by sharing seeds, cuttings, slips/hulis. Maintain garden compost and greywater systems in the school garden. Identify names of the pollinators in the school garden and observe the plants they frequent. Introduce the importance of water consumption for humans and plants.	Define “food security,” “food insecurity,” and “food deserts.” Identify practices that can increase food production and access thereby increasing community food security.	Visit a local farm that practices regenerative and sustainable agriculture. Report or illustrate field trip to that farm. Design and build greywater and/or rain catchment systems. Identify wastewater systems in the garden and community. Interview a local bee farmer. Grow plants to attract bees. Observe bees in the garden. Count and record the numbers of bees observed and what plants attract the most bees. Grow and save seed from at least one crop. Define open pollinated, hybrid, and heirloom plants. Research seed histories.	Explain how a biodiverse system is a resilient system. Explain the process and functions to save and safely store seeds.	Conduct a biodiversity survey in your school garden. Observe relationships that indicate resilience or imbalance in your garden system (e.g., aphids and ladybugs). Identify and describe local honey production. Discuss pollination and local food security. Interview a local beekeeper. Identify pollinators in the school garden. Create a design brief for a plant with desirable traits to save seeds from. Save, store, and propagate seed. Conduct interviews with community members to collect and share seed stories.
Food Seasons and Place	Understand how place influences what foods to grow and when to grow them.	Identify, then draw or describe the crops that grow well in your agricultural area.	Propagate, grow, harvest and prepare one food crop in each growing season (fall, winter,	Summarize processes used to grow, process, and consume a crop.	Design and create a garden bed that optimizes seasonal variations and produces	Explain what grows well in your geographic location and how and when to grow specific	Propagate, grow, harvest and prepare at least three food crops during the appropriate season.

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
		<p>Explain the environmental differences of fall, winter, and spring.</p> <p>Identify which crops grow well in the school garden and in which season they grow best.</p>	<p>spring).</p> <p>Grow the same crop in all three seasons. Record observations, and compare and contrast data. Explain the differences.</p> <p>Describe seasonal differences in foods produced in garden through tastings and observations in class, school, or community.</p>	<p>Predict availability of crop for consumption based on seasonality.</p> <p>Compare and contrast nutritional value and flavor of foods from the garden and canned foods.</p>	<p>optimal success.</p> <p>Read seed packets and catalogues. Predict what varieties will grow well for your microclimate.</p> <p>Use seasonal produce to preserve, share or consume.</p> <p>Understand the concepts of warm and cool, wet and dry weather crops.</p> <p>Identify and plant according to the season. Identify pests in season.</p> <p>Examine Hawaiian Moon Calendar. Observe seasons for fishing and planting. Sow, propagate, and transplant plant varieties according to moon calendar.</p>	<p>plants.</p> <p>Propagate, grow, harvest, prepare, and consume at least three food crops.</p>	<p>Evaluate school lunches using the concepts of seasonality and geographic source. Describe through mapping the concepts of seasonality and geographic sourcing using the results of the evaluation.</p> <p>Grow, document and evaluate varieties of the same crop. Observe the growth rate and vigor of the varieties.</p> <p>Select successful variety to propagate based on data gathered from growing over successive plantings and selection.</p> <p>Identify and treat for pests in season.</p> <p>Examine Hawaiian Moon Calendar. Observe seasons for fishing and planting. Sow, propagate, and transplant plant varieties according to moon calendar.</p>
	Understand the components of your local food system	<p>Describe how food comes to people. Explain where food comes from. Identify the roles people play in food production.</p>	<p>Identify local food producers such as farmers, fishers, ranchers, bakers, and processors. Visit and interview a local</p>	<p>Describe and compare local and global food systems.</p> <p>Relate farmers' market and grocery store food</p>	<p>Visit and interview a local producer or have a producer visit the classroom. Illustrate or explain what was learned.</p>	<p>Describe and compare local and global food systems.</p> <p>Apply traditional food production and waste</p>	<p>Ask a small farmer, fisher, or rancher to present their business model. Prepare questions about the successes and challenges of their</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			producer or have a producer visit the classroom. Illustrate or explain what was learned.	systems to garden grown foods. Describe the cause/effect of a local and global food system.	Interview farmers at local farmers' markets. Draw and explain the food system model. Compare a grocery store model. Interview an animal farming expert. Create a guide to local farmers' markets.	reclaiming methods to modern food systems.	business. Illustrate the food system they operate within. Design a model to utilize fish or other waste in the garden composting system.
	<p>Know when and how to harvest fresh fruits and vegetables for taste and nutritional value</p> <p>Recognize that growing and eating in season optimizes nutrition and food production while encouraging ecological best practices</p>	<p>Connect ripe fresh foods to optimal nutritional value and taste.</p> <p>Name and draw foods that ripen in each growing season.</p>	<p>Identify various stages of ripeness in produce.</p> <p>Describe the differences between ripe and unripe fruits in terms of flavor.</p> <p>Create a word bank to describe how foods taste, what they look like, and how they feel and smell.</p> <p>Identify and draw foods in season on a monthly calendar in the classroom.</p>	<p>Compare and contrast nutritional value of foods from the garden to canned foods.</p> <p>Compare and contrast taste of foods from the garden to canned foods.</p> <p>Define quality foods.</p>	<p>Compare and contrast taste of foods from the garden to canned, frozen or dried foods.</p> <p>Connect ripe, fresh foods to value and taste.</p> <p>Compare and contrast taste of locally grown versus imported (banana from Hawai'i vs. banana from Ecuador).</p> <p>Create one-word poems using descriptive language about garden experiences.</p> <p>Create a map to illustrate seasonality and availability of local food crops.</p> <p>Track food miles of a crop that is imported to eat out of season. Describe consequences of eating out of season, imported foods.</p>	<p>Recognize that growing and eating in season optimizes nutrition and food production while encouraging ecological best practices.</p> <p>Recite the macronutrients in food.</p> <p>Know the roles of macronutrients in body processes.</p>	<p>Know crops in the garden that contain key macronutrients. Research how nutritional values change over time post-harvest. Observe and chart changes in color and taste in the crops post-harvest over time.</p> <p>Plant and make seasonal herbal teas. Research and record nutritional values of herbs grown in garden. Taste and evaluate them.</p> <p>Plant seasonally sensitive crops several times throughout the school year. Compare and contrast plant health vigor, production and taste (e.g., tomato, beans, corn, lettuce, radishes, spinach).</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
Food and Nourishment	<p>Know how to obtain information about food from a variety of sources to make informed food choices.</p> <p>Use nutrition labels, product packaging, cultural history, food stories, indigenous knowledge and practices to shape and inform food choices.</p>	Describe healthy food choices.	<p>Learn the names of garden plants and create signage.</p> <p>Identify differences between whole and processed foods.</p> <p>Learn to read food labels.</p>	<p>Describe foods as defined by various media representations.</p> <p>Compare and contrast media food representations with foods grown in the garden.</p>	<p>Use <i>'Aina Food Guide</i> to classify and label garden crops.</p> <p>Describe various media representations of foods (e.g., commercials, magazines, store shelves).</p> <p>Compare and contrast representations with actual food grown in the garden.</p> <p>Practice reading food labels. Discuss and classify whole and</p>	<p>Explain how food product information is used to discern choices that support health.</p> <p>Identify different sources for information about food.</p>	<p>Compare garden grown foods with pre-packaged foods.</p> <p>Understand the role of bias of advertising on our food choices.</p> <p><i>* See Appendix: 'Aina in Schools Guide: Marketing 101</i></p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
					<p>processed foods.</p> <p>Identify and discuss food labeling and marketing strategies. Define natural, healthy, processed, unprocessed, and organic.</p> <p>Students create an advertisement for a fresh fruit or vegetable.</p>		
	Understand the benefits of a nutritionally balanced and diverse diet	<p>Explain that food provides energy and nutrients for our bodies.</p> <p>Describe how food choice is connected to health.</p>	<p>Identify whole foods that are different colors and discuss their benefits.</p> <p>Grow, harvest and eat from a rainbow garden.</p> <p>Grow and eat from an 'AINA food garden.</p> <p><i>* See Appendix: My Eat Local Hawai'i Plate</i></p> <p>Discuss diversity in the diet.</p> <p>Make healthy snacks from foods bought or grown in the garden. Create healthy snack recipes and a classroom cookbook for families.</p> <p>Model "sip and swallow" to show that people, like plants, need water.</p>	<p>Identify a variety of different colored foods from the garden.</p> <p>Describe the nutritional benefits of foods from the garden.</p> <p>Design a seasonal and nutritionally balanced diet.</p> <p>Identify nutritional attributes provided by different colored foods.</p> <p>Define macro and micronutrients. Explain how micro and macronutrients benefit the body.</p>	<p>Identify nutritional attributes provided by different colored foods.</p> <p>Create and taste a variety of drinks made from garden ingredients. Assess the nutritional components.</p> <p>Design a restaurant menu that changes seasonally and serves healthy sized servings.</p> <p>In the garden, conduct a side-by-side experiment with an energy drink or soda and water: feed garden plants only water, soda, and/or a sports drink. Record observations.</p> <p>Investigate <i>My Eat Local Hawai'i Plate</i>.</p> <p>Introduce <i>"Rethink Your</i></p>	<p>Incorporate and apply health expressions into meaningful daily discourse about the benefits of a balanced, diverse diet.</p>	<p>Identify and taste a variety of different colored foods. Explain the role phytonutrients playing a healthy diet.</p> <p>Prepare a snack or meal from the garden that exemplifies a health slogan such as "eat a rainbow."</p> <p>Participate in a nutrition workshop by a health-care practitioner.</p> <p>Incorporate and apply health expressions into common conversation about the benefits of a balanced, diverse diet.</p> <p>In the garden, conduct a side-by-side experiment with an energy drink or soda and water; feed garden plants only water, soda, and/or a sports</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
					<i>Drink HI</i> Whole Kids Foundation		drink. Record observations.
	Understand the relationship between healthy soil, healthy food, and healthy people.	<p>Explain how healthy soils produce healthy plants.</p> <p>Explain how healthy plants are part of a healthy diet.</p>	<p>Draw a plant and its parts. Describe how the roots get nutrition from the soil.</p> <p>Sing the song, “Dirt Made My Lunch”</p> <p>Amend garden soil with compost and other amendments. Describe why amending the soil is necessary.</p> <p>Harvest food from the garden and eat. Follow established food handling guidelines for eating from the garden.</p> <p><i>* See Appendix: “Dirt Made My Lunch.”</i></p>	<p>Draw a diagram illustrating the Soil/Plant Nutrition Cycle.</p> <p>Explain macro and micronutrients.</p> <p>Describe how plant-growing processes produce plants that are high or low in micronutrients.</p> <p>Explain how human bodies acquire macro and micronutrients.</p>	<p>Observe and describe the Soil/Plant Nutrition Cycle.</p> <p>Draw a diagram indicating Soil/Plant Nutrition Cycle.</p> <p>Prepare, amend, turn and harvest compost to add to garden beds.</p> <p>Harvest food from the amended garden bed and discuss process used. Prepare and share the snack.</p> <p>Explain through illustration how healthy soils produce healthy crops and good nutrition.</p>	<p>Explain the meaning of <i>Mālama i ka ‘Āina</i> or “feed the soil and the soil feeds you.”</p> <p>Describe how <i>Mālama i ka ‘Āina</i> relates to macronutrients, micronutrients, and microbes.</p> <p>Describe the human microbiome and the relationship between a well fed soil, well fed plants, and well fed people.</p>	<p>Apply amendments to the soil that enrich plants and improve nutrient values.</p> <p>Prepare planting beds with and without soil amendments and compost. Plant the same crop in each bed at the same time.</p> <p>Compare and contrast the crops from the two beds, focusing on production, plant health, physical appearance etc. Make inferences about how those crops would impact a person’s body.</p>
	Understand that nutrients in food are assimilated into the human body.	Describe how food provides energy and nutrients for humans.		<p>Explain the human digestive process in terms of breaking down of matter to acquire energy and nutrients.</p> <p>Identify, describe and compare a similar process such as composting and soil preparation.</p>	<p>Observe decomposition in the compost pile.</p> <p>Relate the observation to the human digestive process.</p> <p>List plant nutrient needs and human nutrient needs. Draw conclusions.</p>	<p>Explain how human cells use sugars to make energy (ATP).</p> <p>Explain how nutrients in food are assimilated into the body and used for physical movement as in cellular respiration. Describe cellular respiration.</p>	<p>Explain the human digestive process in terms of breaking down of matter to acquire energy and nutrients.</p> <p>Identify, describe and compare a similar process such as composting and soil preparation.</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
	<p>Appreciate a wide variety of food smells, tastes and textures.</p> <p>Understand a correlation between flavor and nutritional attributes.</p>	<p>Describe new flavors by tasting a variety of familiar and unfamiliar foods.</p> <p>Identify sweet, sour, salty, bitter, and umami sensations.</p> <p>Attribute flavors to certain foods.</p>	<p>Discuss and describe taste sensations sweetness, sourness, saltiness, bitterness, and umami. Give examples of foods that have each taste sensation.</p> <p>Taste fresh foods from the garden. Describe the flavors found in the garden.</p> <p>Create a food journal. Describe and record flavors of foods grown in the garden.</p>	<p>Distinguish between a variety of herbs grown in the garden.</p> <p>Identify plant and culinary uses. Describe flavor.</p> <p>Explain how growing methods, seasonality, and uses in food preparation affect the taste of herbs.</p>	<p>Taste a variety of herbs describe their flavors and name the herb.</p> <p>Taste herbs throughout the year. Identify and describe how plant flavor changes due to seasonality and stage of plant cycle.</p> <p>Identify and describe flavor sensations sweet, sour, salty, bitter and umami of plants in the garden. Chart and categorize results.</p> <p>Compare and contrast foods prepared with and without herbs.</p>	<p>Identify sweet, sour, salty, and bitter, and umami taste sensations.</p> <p>Recognize and appreciate that foods provide different flavors and nutritional attributes.</p>	<p>Sample a variety of plants from the garden and categorize their flavors.</p> <p>Select foods from the garden and describe a variety flavors.</p> <p>Apply flavor vocabulary sweet, sour, salty, bitter, and umami.</p> <p>Prepare snacks or a meal from the garden that includes all taste sensations. Describe and assess the balance of flavors in dishes. Suggest improvements.</p>
Safe Food Preparation	Understand how to process and preserve food crops	<p>Describe how to process foods using a variety of methods such as pickling with salt or vinegar, drying, and preserving with sugar.</p> <p>Explain how preserving methods prevent spoilage.</p>	<p>Grow, process, and preserve one food from the garden such as drying for tea, preserving fruit in sugar.</p> <p>Create a list of vegetables and fruits and attribute preserving methods (e.g., corn can be dried, canned, frozen, and eaten fresh).</p> <p>Process garden foods to create products such as pesto, salsa, guacamole, salad dressing, and smoothies.</p>	<p>Identify various methods of preserving food.</p> <p>Explain how preserving methods prevent spoilage and extend use of products.</p> <p>Describe various food preservation methods.</p> <p>Describe the differences of one food that has been pickled, canned, dehydrated, frozen, and/or packaged.</p>	<p>Compare and contrast various food preservation methods.</p> <p>Grow, process and/or preserve at least one food from the garden. Compare preservation methods and resulting tastes of methods.</p> <p>Create products from the garden such as pesto, salsa, guacamole, salad dressing, and smoothies.</p> <p>Design and build a solar dehydrator.</p>	<p>Process and preserve a variety of food crops.</p> <p>Decipher implications of additives and preservatives on health.</p>	<p>Prepare garden foods for immediate consumption and long-term storage using traditional and modern methods (e.g., preparing poi, cooking stir-fry, fermentation, drying, salting, and canning).</p> <p>Design and build a solar oven.</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
	Understand how to prepare and serve healthy, delicious food	Apply knowledge and skills to prepare and serve food grown in the garden.	Create snacks for the classroom such as lettuce wraps, summer rolls, smoothies and salads, using ingredients from the garden. Use age appropriate methods and tools for food preparation.	Explain or demonstrate a variety of food preparation techniques such as fermentation, canning, freezing, dehydrating, pickling, etc. Demonstrate knowledge and skills to prepare a plant-based snack using foods grown in the garden.	Create recipes and prepare snacks using foods from the garden. Assess and revise recipes. Distribute recipe books. Investigate a variety of processing methods including but not limited to cooking, canning, dehydrating, pickling, fermenting, and preserving.	Explain or demonstrate a variety of food preparation techniques such as fermentation, canning, freezing, dehydrating, pickling, steaming, roasting, poaching. Demonstrate knowledge and skills to prepare a plant-based snack using foods grown in the garden. Explain how cooking food can impact macro and micronutrients.	Select a single ingredient from the garden and prepare it using three different methods such as poaching, steaming, roasting. Discuss and record differences. Harvest, clean, process, present and distribute foods grown in the garden. Package, label and share preserved garden food with community (e.g., <i>Ai Pono</i> , <i>Hokulea</i>).
	Understand how to identify and use best practices to safely harvest and prepare foods	Recall ways to safely handle and prepare food grown in the garden such as hand washing, fruit and vegetable washing, safe use of tools, and proper consuming practices. Best practices School Garden Food Safety Poster .	Models good food safety procedures for harvesting, washing, cutting and preparing fresh foods.	Describe and demonstrate best practices to safely harvest, clean, and prepare foods from the garden. Explain how best practices are connected to food safety in the garden and kitchen.	Identify and explain best practices while harvesting and preparing food, and cleaning utensils and dishes. Demonstrate pinch and claw grips for knife use. Students demonstrate food safety practices by creating a poster or short skit using <i>The School Garden Safety Poster</i> . Knife Handling: Pinch and Claw Grips	Describe best practices to safely harvest, clean, and prepare foods from the garden. Explain how best practices are connected to food safety in the garden and kitchen. Demonstrate the ability to work in the garden and kitchen in a manner that reduces/eliminates personal injury and contamination.	Safely harvest and prepare foods using best practices including knife safety, proper hand washing and food washing, clean harvest tubs, and kitchen set up. Explain how food borne illnesses occur and spread. Knife Handling: Pinch and Claw Grips

Nature’s Design: Systems, Cycles, Patterns, Relationships, and Adaptations in the Garden System
 Theme 4: Scope and Sequence - Grades K-8

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
Food	Understand the plant nutrient cycle (Carbon cycle, nitrogen cycle, N-P-K, and minerals in plant growth)	Describe what plants need to survive. Include water, sun, and micronutrients. Explain how composting recycles nature’s nutrients, (greens are nitrogen and browns are carbon). Draw a model.	Install and/or manage a school garden. Discuss and model behaviors support optimal plant growth. Build, care for, harvest, and apply compost to the garden. Observe and discuss results over time.	Identify and explain the role nutrients play in plant growth. Explain the effect micronutrients have on plant parts such as nitrogen supports leafy growth, Phosphorus supports flower and root development. Explain and illustrate how composting recycles nature’s nutrients (greens are nitrogen and browns are carbon). Identify nitrogen-fixing plants and describe their physical characteristics. Describe the role of nitrogen fixing plants in the nitrogen cycle. Represent how plants bring nitrogen from the air and fix it into the ground. Connect healthy soils and healthy plants to nutrition.	Discuss and draw a model of nutrient cycling. Create signs and labels to place in the garden to mark carbon and nitrogen sources. Plant disease detectives: Identify nutrient deficiencies on plants by reading clues such as yellowing leaves, spots on leaves, etc. Treat plants with appropriate amendments to cure plant diseases.	Explain the components of nutrient cycles and their interrelationships. Healthy/vital soils = healthy/vital foods = healthy vital bodies. Demonstrate or explain where, how and why to apply soil amendments such as compost and mulch to ensure that soils and foods are nutrient rich. Explain how nitrogen fixing cover crops support nutrient cycling and increase soil fertility in the garden.	Research and plant cover crops that enhance soil fertility. Use nitrogen-fixing cover crops as a green manure when preparing a bed for planting. Examine the roots of nitrogen-fixing crops; identify the nitrogen nodules on roots. Describe or illustrate the symbiotic relationship of the plants with the soil bacteria.
	The Soil Food Web Understand the Soil Food Web as a complex living system of organisms in the soil Understand that interactions and relationships within the Soil Food Web contribute to the health of the whole	Describe a food web. Name some organisms within a food web. Identify and explain the relationships within a food web. Explain how healthy soil makes healthy plants, and healthy plants make healthy food.	Discuss the food web while students grow, harvest, prepare and eat simple snacks from the garden. Identify, observe, and draw organisms in soil and compost. Record data over time. * See Appendix: Learn <i>The FBI is on the</i>	Explain that the Soil Food Web includes fungi, bacteria, and invertebrates (FBI). Give examples of how fungi, bacteria, and invertebrates (FBI), and the soil food web create healthy soil and nutritious foods.	Explore fungi, bacteria, and invertebrates (FBI) in the soil. Magnify, categorize, and illustrate findings. Discuss and report.	Compare and contrast soils rich with fungus, bacteria, and invertebrates (FBI) with soils that are not. Identify the abiotic components in soil that support the soil food web (carbon, water, air). Explain how the health of the soil food web impacts	Design a side-by-side experiment using at least two beds with different kinds of amendment. (no compost vs. compost) Observe and record data from control and treatment beds. Interpret the data and present results. Design an experiment using three distinct parts

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
	system	Describe soil as a living system full of organisms that transform organic matter into food for plants.	<i>Scene</i> song by The Banana Slug String Band.			the health of the soil. Describe the relationship between soil, food, body: Healthy/vital soils = healthy/vital foods = healthy vital bodies.	of the garden (compost, path, bed). Lay a transect line, randomly sample along the transect line using a quadrat. Observe and record quantitative and qualitative data such as plant and insect diversity within each quadrat. Analyze and interpret the data. Present findings using graphs, illustrations and oral arguments.
	Understand a variety of growing systems in Hawai'i such as indigenous, conventional, aquaponic, hydroponic, agroforestry, permaculture, and organic gardening	Describe where food comes from. Give examples of three different growing systems.	Share stories about canoe crops. Identify, grow, and taste canoe crops. Lead a discussion about where our food comes from. Include a variety of examples such as the garden, a grocery store, the ocean and forest, a farm, and a farmers' market. Tend the school garden. Make observations about where food comes from. Visit a local farm. Observe and describe the systems that occur at the farm.	Compare and contrast properties and qualities of various food growing systems. Include but do not limit to yield, size, inputs, ecological impact, nutrition profile. Identify and describe canoe crops' growing systems and experiment with growing those crops in other systems (e.g., aquaponics).	Identify and describe a variety of growing systems such as indigenous, conventional, aquaponic, hydroponic, agroforestry, permaculture, and organic gardening. Grow a food crop in two to four different growing systems. Compare and contrast properties and qualities of food produced. Include but do not limit to yield, size, inputs, ecological impact, nutrition profile, etc.	Compare and contrast several different types of growing systems and soil mediums. Collect data and make conclusions about information from data collected. Report results. Describe characteristics of canoe crops and explain how they are well adapted to the environment in Hawai'i.	Design and implement one or more types of growing systems. Collect data of properties, qualities (taste), cost of inputs, and human labor to build and maintain systems. Compare and contrast several different types of growing systems and soil mediums. Evaluate for health and production of biomass. Identify and describe canoe crops growing systems and experiment with growing those crops in other systems (e.g., aquaponics).

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
Energy and Matter	Understand the energy cycles in the garden system	<p>Describe photosynthesis as the flow of energy from sun to plants to food through storytelling.</p> <p>Describe thermal heat. Identify heat sources in the garden environment.</p> <p>Describe how the sun warms the land, the water, and the air.</p>	<p>Explore, record, and graph sources of heat in the garden environment using touch or a thermometer.</p> <p>Explore the concept of thermal energy as a form of heat (e.g., heat in compost, body heat after physical exercise, and reflected and absorbed heat of dark and light objects). Describe observations.</p> <p>Plan and conduct an investigation to determine if plants can grow without sunlight.</p> <p>Compare the temperature of water in direct sunlight and water in the shade. Draw conclusions.</p>	<p>Explain the transfer of energy from sun to plants to animals.</p> <p>Identify and illustrate examples of energy transfer and flow in the garden.</p>	<p>Make observations of plants and animals in the garden. Organize and record observations of energy cycles in the garden.</p> <p>Compare survival needs and relationships of plants and animals in the garden.</p>	<p>Explain how the sun is the source of energy for all living things on the planet.</p> <p>Define photosynthesis and explain how photosynthesis is the foundation the food chain.</p> <p>Compare and contrast organisms in the garden to organisms in other ecosystems.</p>	<p>Design an experiment to analyze the effects of different amounts of light on germinated seedlings.</p> <p>Plant 2 rows of lettuce or root crops. Cover half with shade-cloth and leave remaining crop exposed to full sun. Compare and contrast the differences.</p> <p>Measure temperature in compost and graph heat over stages of decomposition. Infer heat is a byproduct of the processes of cellular respiration of bacteria.</p> <p>Observe how ambient temperature affects the movement of macroorganisms in the garden.</p>
	<p>Energy and Matter in the Food Web:</p> <p>Understand trophic levels of the food web and the proportional relationships of producers to consumers, carrying capacity and population equilibrium</p>	<p>Identify and name producers and consumers in the garden.</p> <p>Identify and name pests and predators in the garden.</p> <p>Give examples of interdependent relationships among plants, animals, and humans in the garden environment.</p>	<p>Identify and name producers and consumers in the garden and community.</p> <p><i>* See Appendix: Play The Pest and Predator Game.</i></p> <p>Define and identify pests and predators in the garden. Illustrate the characteristics of pests and predators.</p>	<p>Identify producers, consumers in the garden. Explain the role humans play as producers and/or consumers in the garden.</p> <p>Describe the relationship between producers and consumers. Which population has more, how do they affect the garden systems, when are the populations out of balance and in balance?</p>	<p>Observe and collect data of plants, animals, and humans in the garden. Categorize them as producer and/or consumer.</p> <p>Define balance as it relates to producers and consumers in the garden environment.</p> <p>Investigate the relationship between producers and</p>	<p>Describe and illustrate the proportional relationship between producers and consumers. Explain how producers and consumers dictate carrying capacity in a garden system.</p> <p>Explain consumption of energy along the food chain.</p>	<p>Identify producers, consumers, tertiary consumers and decomposers in the garden.</p> <p>Investigate proportional relationship between producers and consumers and how they dictate carrying capacity in garden systems. Define carrying capacity.</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
		<p>Explain how resources can be limited. Give an example of a limited resource.</p>	<p>Create stories that describe interdependent relationships of pests to their habitat.</p> <p>Find examples in the garden that illustrate that natural resources can be used, underused, and overused (e.g., soil, water, sunlight, mulch).</p>	<p>Provide examples from the garden that demonstrate populations in and out of balance.</p> <p>Explain the soil food web, energy transfer, and the trophic levels. Give examples of how they are interrelated.</p>	<p>consumers. Predict which populations are greater in number.</p> <p>Infer how producers and consumers affect the garden systems. Cite examples of when populations are in and out of balance.</p>	<p>Analyze the impact of an invasive species on the diversity of an ecosystem. Describe the impact of invasive species on carrying capacity.</p> <p>Evaluate the interdependence of organisms on environmental resources and how they affect population size.</p>	<p>Food System: Create a representation that explains how food is energy and matter that is passed from organism to organism and through trophic levels. Describe a scenario in which a higher population of consumers can exist by consuming lower on the food chain.</p> <p>School Garden: Observe, count and record number of plant species in two distinct locations in the garden. Select one with invasive species and one without. Evaluate population diversity and analyze abundance.</p> <p>Compost Pile: Observe and collect data of volume in a compost pile over time. Relate findings to availability of resources. Discuss carrying capacity for fungi, bacteria, and invertebrates (FBI).</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
	<p>Understand forms and transformation, and conservation of energy.</p> <p>Understand kinetic, potential, thermal, and chemical energies.</p>	<p>Describe the effect of sunlight on the earth's surface.</p> <p>Explain how to reduce the warming effect of sunlight on an area.</p> <p>Describe or illustrate how energy cycles from sun to plant to animal and human.</p> <p>Give examples of ways that energy is used to move an object.</p>	<p>Design and build a structure that will reduce the warming effect of sunlight on an area. Explain how the structure reduces the warming effect of sunlight.</p> <p>Observe and compare the temperature of differences of surfaces in the garden such as mulch, soil, rock, and grass. Select a variety of light absorbing and reflecting surfaces.</p> <p>Measure and record the temperature in a variety of locations in the garden. Record data. Discuss how temperature would change over time and what would influence that change.</p>	<p>Identify and explain examples of energy types such as kinetic, potential, thermal, chemical. Use examples from the garden when possible.</p> <p>Cite examples of evidence that energy can be transferred by light and heat.</p>	<p>Conduct a garden energy identification walk. Discuss observations.</p> <p>Identify and explain three methods of moving water in the garden such as through a hose or pipe, carrying water in buckets, using gravity. Identify how energy is transformed as the water moves.</p> <p>Design and implement a system to move water in the garden.</p> <p>Discuss energy transfer of food to human body after eating lunch or a garden snack.</p> <p>Identify and explain examples of energy types such as kinetic, potential, thermal, chemical.</p>	<p>Explain how humans are an intrinsic part of energy transfer in the garden.</p> <p>Identify and describe energy transformation in the forms of potential, kinetic, thermal, and chemical in the garden. Apply transfer of energy to food in the garden.</p> <p>Assess changes in matter (garden products) that occur as a result of processing such as cooking, fermenting, drying, and making compost tea.</p>	<p>Kinesthetic activity: Explain how plants build sugars up, humans break them down. Evaluate and measure the kinetic energy during cooking. Explain how higher temperature equals higher kinetic energy.</p> <p>Fill different colored hand-washing tubs with water at the beginning of class. Leave them in the sun and compare the temperatures at the end of class.</p>
	Understand chemical and physical changes in the garden system and classroom kitchen	<p>Explain the difference between a chemical and physical change. Give examples.</p> <p>Give examples of changes in matter due to heating or cooling.</p> <p>Describe taste and texture differences between raw, frozen and cooked vegetables or fruits.</p>	<p>Harvest and prepare fruits or vegetables from the garden. Heat, freeze, and leave some raw. Compare the taste and texture of each.</p> <p>Discuss whether changes can be restored or are permanent.</p>	<p>Explain the difference between a chemical and physical change. Give examples.</p> <p>Explain how some changes caused by heating and cooling can be reversed and some cannot be reversed.</p> <p>Describe the physical changes such as texture and color that occur with varying cooking times.</p>	<p>Explore a variety of food processing methods such as fermentation, blanching, steaming, freezing, and drying.</p> <p>Observe and discuss changes in the food before and after processing. Compare and contrast - texture, color, taste, smell.</p>	<p>Explain the difference between a chemical and physical change. Give examples.</p> <p>Make predictions about the physical and chemical changes of food in the garden and kitchen.</p> <p>Describe the wind, sun, and water patterns in the garden in terms of potential energy sources.</p>	<p>Create four examples of physical and chemical changes that occur in the garden and kitchen. Examine ingredients before change occur, make predictions about what will happen, and describe the changes after they occur.</p> <p>Design an experiment for solar heating of water. Use different colored materials as an independent variable. Compare temperature</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
				Describe chemical changes in terms of taste, odor, and texture of the same ingredient during different stages of fermentation.			<p>from beginning and end of class.</p> <p>Boil and freeze a variety of substances from the garden. Identify changes in states of matter. Describe the relationship between kinetic and thermal energy.</p> <p>Identify and examine a variety of physical and chemical changes:</p> <ul style="list-style-type: none"> • Cook food in solar ovens. • Mix salt and pepper. • Emulsify salad dressing. • Oxidize fruits and vegetables • Cut, mince, and puree vegetables.
	Understand fossil fuels and renewable energy in terms of inputs, outputs, and the transformation of energy	<p>Define and give examples of renewable energy resources at home, in the school environment, or in the community.</p> <p>Name and describe examples of renewable energy resources in the garden.</p>	<p>Identify and discuss renewable energy sources in the garden, school environment, or community.</p> <p>Draw a renewable energy resource that occurs in the garden, school environment, or community.</p>	<p>Define renewable energy sources in the garden, home, school environment, or community.</p> <p>Define non-renewable energy sources in the garden, home, school environment or community.</p> <p>Compare and contrast renewable energy resources and fossil fuels. Infer the impact of renewable resources and fossil fuels.</p>	<p>Identify, describe, compare and contrast one renewable energy resource with fossils fuels.</p> <p>Assess the impact of each energy form on environment and human labor. Outline pros and cons of each energy resource.</p>	<p>Identify and explain the types of energy available in Hawai'i. Distinguish between energy that comes from the island and not from the island.</p> <p>Critique different models for generating electrical energy: renewable, fossil fuels, nuclear, etc. Critique may include: cost, human labor to build and maintain the systems.</p> <p><i>* See Appendix: Kokua Foundation's Nutrition Lesson Skit.</i></p>	<p>Identify where Hawai'i's energy comes from.</p> <p>Identify and describe different models for generating electrical energy such as renewable, fossil fuels, nuclear, etc. Include cost of materials, human labor to build and maintain the systems, and environmental impact.</p> <p>Compare energy inputs of cultivating a plot of land with a tractor, a rototiller, and a garden fork.</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
							Compare use of a solar pump or an electric pump for a hydroponic system. (Discussion Topic)
Water	<p>Understand the water cycle and its interrelationship with weather and climate</p> <p>Understand the properties of water</p>	<p>Explain why water is important for the survival of all living things.</p> <p>Identify that approximately 75% of the earth and our bodies are made of water.</p> <p>Describe the Water Cycle and name the three forms of water.</p>	<p><i>* See Appendix: Play the Water Cycle Relay Game.</i></p> <p><i>Water exploration with various sizes of containers.</i></p> <p><i>Sing the Water Cycle Boogie.</i></p>	<p>Explain and illustrate the water cycle. Define the terms precipitation, condensation, and evaporation.</p> <p>Explain that earth's water has existed since the earth was formed.</p>	<p>Label all parts of the water cycle.</p> <p>Illustrate how weather cycles impact the water cycle.</p> <p>Map a local watershed; include drinking water sources and wastewater treatment systems. Have a class discussion.</p>	<p>Describe the cyclical patterns of air and water movement on Earth and identify these patterns in the garden.</p> <p>Explain that Earth's water has existed since the Earth was formed.</p>	<p>Observe water in the garden. Reflect and relate that this water has existed since the Earth was formed.</p> <p>Research water sources in garden. Collect rainwater for use in garden.</p> <p>Create a rain station: use a rain gage to log rainfall in the garden. Observe and report seasonal trends. Compare school garden data to official rainfall data for your location.</p> <p>Identify and describe parts of the water cycle found in the school garden.</p> <p><i>* See Appendix: The Earth's Water as an Apple activity.</i></p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
	Understand the action of water on living systems	<p>Define erosion.</p> <p>Create a model or identify a solution that slows/prevents the impact of water on the shape of the land.</p> <p>Explain why water flows down hill.</p> <p>Explain why the forest is an essential component of the Water Cycle.</p>	<p>Conduct an investigation and compare plants grown or seeds started with and without water.</p> <p>Develop a system for watering the garden and nursery plants. Explain how to know when and how much water is needed. Use sensory indicators (sight and touch) to determine soil moisture.</p> <p>Identify areas of the garden or school campus that are impacted by water. Discuss and design a solution for the problem. Compare multiple solutions.</p>	<p>Understand the functions of water as diluter, solvent, transporter, insulator, and diffuser.</p> <p>Provide evidence of erosion damage by water in the garden or local environment.</p>	<p>Make compost tea. Observe and document the changes in the color and shade of the tea as water is added. Explain dilution and transport.</p> <p>Drink fresh drinking water. Then dissolve some salt into the water - compare and contrast.</p> <p>Develop an experiment that compares the results of putting worm castings directly into the soil versus making tea. Explain in terms of diffuser and transporter.</p> <p>Blow up a balloon with air. Fill another balloon with water. Hover both balloons over a flame. Which one bursts? Which one doesn't? Water as insulator.</p>	<p>Demonstrate and explain the use of water in the garden as diluter, solvent, transporter, insulator, diffuser.</p> <p>Define erosion</p>	<p>Create an example of watering through capillary action over time using a string and bucket.</p> <p>Use water as a diluter when applying worm or compost tea and soil amendments.</p> <p>Make herbal tea with various quantities of Fresh herbs.</p> <p>Place 2 identically shaped pans in the sun. Fill one pan with water. Measure the temperature beneath the pans. After some time in the sun measure the temperature beneath the pans. Move them to the shade for 20 minutes and compare temperatures again.</p> <p>Identify erosion by water in your garden. Take steps to prevent erosion.</p>
	<p>The hydrology of Hawai'i Island</p> <p>Identify drinking water sources for Hawai'i Island</p>	<p>Identify and illustrate where our water comes from, how it is used, and where it goes.</p> <p>Explain and demonstrate ways to conserve water at home, in the garden, in the school environment, and community.</p> <p>Identify the type of bodies of water in your area.</p>	<p>Investigate and discuss where the water used in the school garden comes from.</p> <p>Students discuss how water can be conserved in the garden.</p> <p>Discuss and create ways to conserve water at school and at home.</p> <p>Create a model to represent the shapes and</p>	<p>Recognize the unique features of the hydrology of Hawai'i as presented in place-based stories.</p> <p>Identify local drinking water sources for home and school.</p>	<p>Map a local watershed including drinking water source and wastewater treatment systems. Have a class discussion</p> <p>Conduct tests on irrigation water and/or stream water for pH, nitrogen, phosphate, and salinity. Report results.</p>	<p>Identify local freshwater sources and explain how the freshwater sources are a result your locale's land formations.</p> <p>Assess the renewability/future availability of water as resource in the garden.</p>	<p>Identify and describe the role plants play in the water cycle. Use transpiration bags as evidence.</p> <p>Observe wind patterns in the garden and identify seasonal trends.</p> <p>Create a rain station: use a rain gage to log rainfall in the garden. Observe and report seasonal trends. Compare school</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			kinds of land and bodies of water in your area.				garden data to official rainfall data for your location.
	Understand water storage, sources, and management	<p>Identify current and potential water sources in the garden.</p> <p>Identify when a plant needs water. Demonstrate appropriate amount and method of watering.</p> <p>Identify where water is found on the island and on the earth. Explain the three forms it can take.</p> <p>Identify and present solutions to a water related problem in the garden.</p>	<p>Conduct a water hunt: Locate water in the garden. Observe and interpret a rain gauge. Make wet versus dry observations and perform sight and touch tests of the soil moisture.</p> <p>Observe and discuss the role of mulch and soil in the garden.</p> <p>Eliminate standing water as vector for disease.</p> <p>Develop and implement wise water practices in the garden.</p> <p>Identify a water problem in the garden or school environment. Develop and test solutions.</p> <p><i>* See Appendix: "Fight the bite." Hawai'i Department of Health</i></p>	<p>Identify water systems in the garden.</p> <p>Define public water system and explain the role of the school garden water systems as a part of the public water system.</p>	<p>Create a water usage or best practices plan for the garden.</p> <p>Design an irrigation system.</p> <p>Eliminate standing water as vector for disease.</p> <p>Map the local public water system include homes, parks, schools, and buildings.</p>	<p>Identify water sources in the garden.</p> <p>Identify where water is needed in the garden and design irrigation systems for garden.</p>	<p>Evaluate where water is needed in the garden</p> <p>Design, construct, and implement various irrigation systems. Record effects on garden ecosystems such as soil salinification and plant growth.</p> <p>Eliminate standing water as vector for disease:</p> <p>Compare irrigation systems efficiency in terms of water conservation such as drip irrigation versus overhead watering.</p> <p><i>* See Appendix: "Fight the bite". Hawai'i Department of Health</i></p>
Natural Resource Management and Conservation	Understand water conservation and management practices	<p>Identify solutions that reduce the impact of humans on land, water, air, and other living things in the local environment.</p> <p>Describe or illustrate how water can be safely reused.</p>	<p>Identify a problem concerning wastewater. Create a solution and design a model to solve it.</p> <p>Demonstrate safe harvesting, washing, and handling practices for preparing garden produce.</p>	<p>Define water conservation and management. Give examples of water conservations and management practices.</p> <p>Observe and measure water use. Identify and recommend best practices to support water</p>	<p>Define and describe various types of wastewater in school environment. Include garden greywater, kitchen greywater, and water water.</p> <p>Design a system to use garden greywater in a garden system.</p>	<p>Explain why fresh water is a finite resource.</p> <p>Identify the roles and impact that individuals and communities play in water conservation.</p> <p>Illustrate a garden water system nested within an entire watershed.</p>	<p>Utilize grey water in garden systems for plants.</p> <p>Create a catchment system to mitigate effects of treated water.</p> <p>Identify water conservation practices at home and at school.</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
		Explain the importance of using potable water for washing garden produce.		conservation at home, school and in the community.		Identify appropriate use and limitations of greywater and county water.	Investigate the impacts of home and garden use on water systems. Investigate the impacts of community conservation efforts.
	Understand water quality	<p>Define potable and nonpotable water.</p> <p>Identify sources of clean drinking water at school, in the garden, at home, and in the community.</p> <p>Identify rainwater as a resource for watering plants.</p>	<p>Define and identify sources of clean drinking water in the garden and in the school environment.</p> <p>Discuss the importance of drinking water during the day.</p> <p>Make and use a simple and clean drinking cup from available resources.</p>	<p>Define and describe the differences between black water and greywater.</p> <p>Define potable water. Explain why it is used for hand washing and washing fresh fruits and vegetables.</p> <p>Compare and contrast how different water sources impact plants.</p>	<p>Develop a system that utilizes grey water in the garden to solve a problem.</p> <p>Investigate how to safely use greywater in the garden. Design a system that safely uses greywater in the garden.</p> <p>Conduct an experiment in the garden by watering plants with water from different sources. Example: Watering plants with rainwater vs. municipal water - growth, yield, color, etc.</p>	<p>Define blackwater, greywater, potable and nonpotable water.</p> <p>Analyze water systems in the garden and design improvements for greywater use.</p> <p>Design a water system that uses potable and non-potable water correctly in the garden, such as using potable water for processing garden products and greywater for watering plants. Explain or illustrate.</p>	<p>Utilize grey water in garden systems for plants.</p> <p>Compare and contrast how different water sources impact garden. Example: Rainwater vs. municipal water in garden uses.</p> <p>Define the distinctions between and identify potable and non-potable water in the garden.</p> <p>Discuss the health implications of non-potable water. Explain how water is a vector for contaminants and examine inputs and outputs in garden water systems.</p> <p>Create a catchment system to mitigate effects of treated water.</p> <p>Examine impacts of home and garden practices on water systems.</p>

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
	Understand organic nutrients for soil fertility and identify local sources of organic nutrients	<p>Identify organic resource materials in the garden and on campus. Explain how organic materials can be reused.</p> <p>Explain how compost is nature’s recycling system.</p> <p>List the organisms involved in recycling organic matter.</p> <p>Explain and illustrate how food production creates waste that can be recycled.</p>	<p>Identify, gather and use organic materials on campus for composting.</p> <p>Design and construct a composting system using recycled waste from the garden, classroom, and cafeteria and home.</p> <p>Observe and manage a vermicompost bin. Harvest and use vermicompost in growing systems.</p>	<p>Explain organic materials as output and input for other organisms.</p> <p>Describe a healthy disposal of discarded materials from human systems that uses fungi, bacteria, and invertebrates to recycle matter and natural materials.</p> <p>Draw a map or create a model that shows the production and use of organic nutrients.</p>	<p>Create a compost pile using paper and prunings to demonstrate layering brown and green waste.</p> <p>Identify discarded materials from human systems. Categorize organic and inorganic materials. Sort organic materials into green and brown layers. Integrate into compost systems.</p> <p>Identify byproducts from food growing, production, transportation, and consumption.</p>	<p>Explain how to create and utilize local sources of organic nutrients for soil fertility.</p> <p>Differentiate between the bi-products of organic vs. inorganic materials as they decompose.</p> <p>Design a zero waste system for the school environment.</p>	<p>Assess the school environment as a resource for building a layered compost system:</p> <p>Identify and utilize local resources for soil fertility. “Feed the Soil and the Soil Feeds You.”</p> <p>Collect, weigh and record discarded organic materials from school and apply to compost system.</p> <p>Examine debris from the garden and identify how it is used in the garden ecosystem.</p> <p>Use correct proportions of carbon, nitrogen, moisture and air.</p>
	Understand recycling, upcycling, downcycling of inorganic materials	<p>Define organic and inorganic materials.</p> <p>Define waste.</p> <p>Identify ways that inorganic materials can be reused.</p> <p>Identify waste as a human generated material.</p> <p>Explain how nature reuses materials and humans produce waste.</p> <p>Define and give examples of the Four Rs: Reduce, Reuse, Recycle, and Refuse.</p>	<p>Identify discarded materials from human systems. Sort into organic and inorganic materials.</p> <p>Bury organic and inorganic materials and dig them up after 1 week, 1 month, and 6 months. Mark the spot & date. Compare and contrast finding.</p> <p>Compost, recycle, or reuse as much as possible in the garden.</p> <p>Discuss: Where does our trash go? Why do we have to reduce, reuse,</p>	<p>Categorize human discards aka waste into compostable, recyclable, refuse, and reusable.</p> <p>Identify uses for discarded materials from human systems.</p> <p>Explain how human waste is made from natural resources. Identify how human waste can be a useful material.</p> <p>Define and give examples of the Four Rs: Reduce, Reuse, Recycle, and Refuse. Formulate ways to incorporate the</p>	<p>Explore using a composting toilet on campus.</p> <p>Audit discarded materials in the classroom and cafeteria trash.</p> <p>Create recycling signs for campus recycle center. Set-up recycling center for garden area.</p> <p>Read <i>Hawai’i Recycling Guide</i>. Take copy home and discuss.</p>	<p>Explain the difference between the bi-products of organic versus inorganic materials.</p> <p>Describe how organic and inorganic materials have different rates of decomposition. Explain why inorganic materials persist over time.</p> <p>Critique individual and collective consumer behaviors. Assess bi-products from garden food, and processed and packaged foods.</p> <p>Define or illustrate a “Zero Waste” system.</p>	<p>Compare and contrast the volume, mass, and reusability of packaging from various sources.</p> <p>Design, create, and maintain a zero waste system for the school garden.</p> <p>Create a decomposition timeline of discarded products with real examples.</p> <p>Reuse and repurpose materials in the garden.</p>

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
			recycle, and refuse? Where are the recycling stations on our Island?	Four Rs into daily practices.			
	Understand components of air quality	Define air quality. Explain how human and natural systems impact air quality.	Track local air quality and compare it to a sister school. Identify factors that affect air quality. Identify air cleaners. Explore the earth's air. Identify what it is made of and how we rely on it.	Identify human activities that produce and reduce air pollution. Describe natural systems that increase air quality.	Discuss cigarette smoking air pollution and potential water, soil and pollution. Discuss the effect of cigarette smoking on human health--both first and second hand smoke. Describe or illustrate the process of photosynthesis as nature's air quality filter.	Describe ways in which the garden can mitigate human behaviors that impact air quality.	Observe systems in the garden that produce clean energy such as photosynthesis, solar pumps, human power, and weed mats.
	Understand carbon footprint and carbon sequestration	Describe how plastic is made. Explain how an organic material is transformed into an inorganic material.	Create a plastics recycling program for the classroom and school. Wash, reuse, or recycle all plastics that are used in the garden. Repurpose containers such as egg or milk cartons, for seedlings and potted plants.	Define and give examples of carbon footprint and carbon sequestration. Explain how maintaining a garden reduces carbon footprint and sequesters carbon.	Obtain, record and assess information about the carbon footprint of personal and family activities. Identify carbon sources in the garden. Compare and contrast with carbon sources in the classroom. Discuss ways to mitigate carbon footprint. Create a carbon sequestration plan for families, school, or communities. Assess and report on the reduction of carbon footprint and increase of carbon sequestration in the garden.	Understand, describe, and interpret the carbon footprints of human activities and their impact on air quality.	Identify practices in the garden that impact the carbon footprint. Identify practices that mitigate the carbon footprint.

Strand	Topic	K–2		3–5		6–8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
	Understand sources and impacts (air water and soil) of clean energy in the community	Describe human activities at school or home that consume energy.	Discuss energy consumption and give examples. List sources of energy for human activities.	Identify and explain systems that produce clean energy. Explain that human energy consumption impacts air, water, and soil quality.	Describe solar, wind, and methane gas collection as clean energy sources. Identify and describe how petroleum gas causes air pollution.	Define carbon footprint. Explain garden systems that sequester carbon. <i>* See Appendix: "Carbon Footprint Survey"</i>	Build compost piles to sequester carbon.
Best Conservation Practices	Understand the individual's and collective's role in the conservation of natural resources Understand that conservation is a set of practices that preserve, restore, and protect natural resources and ecosystems	Identify and describe natural resources in your location and explain how humans use them. Give examples of behaviors that reduce the impact of humans on land, water, air, and/or other living things in the local environment.	Recycle and reuse all natural resources in the garden. Discuss how humans impact the land, water, air, soil, or other living things. Create a plan to plant trees in the school environment or community. Identify invasive species in your community. Create a plan to reduce invasive species. Identify and plant native species in your school garden or environment. Learn their Hawaiian names and stories. Plant the state flower Hibiscus Brackenridgei Ma'o Hau Hele	Identify human activities that consume or pollute natural resources. Identify human activities that restore, preserve, and/or protect natural resources. Describe the significance of both local and non-regional historical, cultural, and/or archeological conservation practices.	Study plastic bags as pollution. Identify the effect on birds, ecosystems, and marine life. Discuss Hawai'i as the first state to ban plastic bags. Pick up litter on campus. Examine ahupua'a map. Discuss the use of ahupua'a names in everyday language. Connect use of ahupua'a names to conservation practice. Identify and participate in local historical, cultural, and/or archeological conservation practices. Identify and participate in non-regional historical, cultural, and/or archeological conservation practices.	Interpret data from the garden about renewable and nonrenewable resources. Identify and explain garden systems that preserve, restore, and/or protect non-renewable resources such as saving water. Identify and describe various sources of mulch. Compare and contrast local and non-regional historical, cultural, and/or archeological conservation practices.	Collect and interpret data from the garden about renewable and nonrenewable resources. Design garden systems that preserve, restore, and/or protect non-renewable resources (e.g., saving water). Identify, collect and use sources of mulch. Compare and contrast local and non-regional historical, cultural, and/or archeological conservation practices in your garden.

Strand	Topic	K-2		3-5		6-8	
		Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities	Learning Outcomes	Garden Activities
	<p>Understand how to preserve, repair, and prevent deterioration of the environment, topsoil, water, and natural resources</p> <p>Understand invasive species</p> <p>Understand that waste reflects imbalance in a system</p>	<p>Identify and explain water damage and soil erosion in the garden environment.</p> <p>Design a Zero Waste system for the garden, classroom, or home.</p> <p>Define, explain behaviors, and give examples of invasive species in your geographical area. Describe their impact on the environment.</p>	<p>Plant trees in school environment.</p> <p>Conduct a native plant identification project in the garden or school environment.</p> <p>Share stories of the native plants in your geographic region.</p> <p>Identify and research invasive species in your geographic region. Create a plan to reduce the impacts of invasive species.</p>	<p>Identify and explain water damage and soil erosion in the garden environment.</p> <p>Explain how Zero Waste system works in the garden.</p> <p>Identify the impacts of invasive species.</p>	<p>Identify and explain erosion in the garden.</p> <p>Design and implement a plan to mitigate the erosion.</p> <p>Design and implement a Zero Waste system for your garden.</p> <p>Design and implement a simple Integrated Pest Management plan.</p>	<p>Identify and explain water damage and soil erosion in the garden environment.</p> <p>Design and explain a Zero Waste system.</p> <p>Explain a 4R (refuse, reduce, recycle, reuse) system for the garden. Describe how the system preserves, repairs, and prevents deterioration of the environment.</p> <p>Explain how Zero Waste system works in the garden.</p> <p>Explain the impacts of invasive species and cite examples of management practices for invasive species.</p>	<p>Identify erosion in the garden and implement a plan to mitigate it.</p> <p>Design and implement a 4R (refuse, reduce, recycle, reuse) system for the garden.</p> <p>Design and implement a Zero Waste system for the garden.</p> <p>Design and implement a simple Integrated Pest Management plan</p> <p>Manage and dispose of invasive species in the garden and in the school environment.</p>