



Frameworks for Success in Science – MSP Grant

WORKING DRAFT COHORT I & II

Kaumana, Kapiolani, Kalaniana'ole, EB DeSilva, Hilo Union and Ha'aheo Elementary Schools

Content Area: Interdisciplinary/Science

Gr4 Qtr2

<p><b>Timeline -&gt;</b></p>	<p><b><u>Quarter Two</u></b></p>
<p><b>Guiding Questions</b></p>	<p><b><u>Science:</u></b>          What are the parts of an ecosystem?          What factors influence ecosystems?          How do humans affect ecosystems?          What are the roles (consumers, producers, decomposers) of living things in simple food pyramids?          How do living things get energy?</p> <p><b><u>Language Arts:</u></b>          What can we learn about living things in ecosystems by reading?          How can we write to show the steps we have used in the scientific method?          How can adjectives help our written science descriptions?</p> <p><b><u>Math:</u></b>          How can Venn diagrams help sort items that are the same or different?          How is a bar graph drawn to show totals with provided data?          What conclusions can we draw from the data portrayed by the graph?          How can we use mathematics processes to solve problems? How are ratios used to solve problems?</p> <p><b><u>Social Studies:</u></b>          How can we use information to solve a societal problem?</p> <p><b><u>Art:</u></b>          How can we draw/illustrate and label sketches for a science notebook?          How can we create 3-D models to showcase food webs/pyramids?</p>
<p><b>General Learner Outcomes</b></p>	<p><b><u>GLO#1: Self-Directed Learner:</u></b>          Students will create .....</p> <p><b><u>GLO#2: Community Contributor:</u></b>          Students will share</p> <p><b><u>GLO#3: Complex Thinker:</u></b>          Students will use their problem solving, math and writing skills to investigate</p> <p><b><u>GLO#4: Quality Producer:</u></b>          Students will create a final product (poster/diorama/model) that illustrates the</p> <p>Students will create math products (graphs, data tables, charts) that enhance posters and diorama.</p>



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	<p><b><u>GLO#5: Effective Communicator:</u></b>          Students will listen, discuss and record information from their different lessons through oral, written and math pieces that illustrate concepts they have learned about.          Students will orally share with younger students their final products.</p>
<p><b><i>Assessments</i></b></p>	<p>Formative and summative textbook assessments.          Constructed response (math, language arts, science) that is based on the unit ideas and concepts</p> <p>A summative product rubric will be used to assess the final science poster/diorama/model that each student produces.</p> <p>The rubric criteria will include assessment of the presentation of concepts learned, as well as the written and drawn presentation quality.          Oral communication of final project</p>

**Big Idea(s) / Major Understanding(s):** *Students will understand that...*

Organisms (plants and animals) respond and behave differently to noticeable changes of weather, seasons, and climate in their environment.

Food chains and food webs are affected by introduced species. Technology (e.g., grafting plants, eradication methods like poisons and traps, greenhouses for propagation, soil and water conservation practices) enables the preservation of Hawaii's native plants and animals.

Organisms (plants and animals) respond to each other in their environment (e.g. competition for light, food, water, space, and mate)

A range of environmental conditions must exist to meet the specific needs of an organism for survival.

The adaptations of an organism allow it to survive in an environment.

Hawaii's unique environment attracts world wide research efforts and technology from ocean to land (ahupu'a'a) and on outer space (observatories).



## Standards and Benchmarks

- ◇ 4.1.1 **Scientific Inquiry**  
*Describe a testable hypothesis and an experimental procedure*
- ◇ 4.1.2 **Scientific Knowledge**  
*Differentiate between an observation and an inference*
- ◇ 4.2.1 **Science, Technology, and Society**  
*Describe how the use of technology has influenced the economy, demography, and environment of Hawaii*
- 4.3.1 **Cycles of Matter and Energy**  
Explain how simple food chains and food webs can be traced back to plants
- 4.3.2 **Interdependence**  
Describe how an organism's behavior is determined by its environment
- ◇ 4.5.2 **Unity and Diversity**  
*Describe the roles of various organisms in the same environment*
- 4.5.3 **Unity and Diversity**  
Describe how different organisms need specific environmental conditions to survive

## Sample Performance Rubrics

<b>Topic</b>	Cycles of Matter and Energy		
<b>Benchmark SC.4.3.1</b>	Explain how simple food chains and food webs can be traced back to plants		
<b>Sample Performance Assessment (SPA)</b>	The student: Diagrams and explains a simple food chain or food web that begins with plants.		
<b>Advanced</b>	<b>Proficient</b>	<b>Partially Proficient</b>	<b>Novice</b>
Compare the characteristics of simple food chains with those of food webs	Explain how both simple food chains and food webs can be traced back to plants	Describe how simple food chains or food webs can be traced back to plants	Recognize that simple food chains or food webs can be traced back to plants
<b>Topic</b>	Interdependence		
<b>Benchmark SC.4.3.2</b>	Describe how an organism's behavior is determined by its environment		
<b>Sample Performance Assessment (SPA)</b>	The student: Describes how an organism's behavior is affected by its environment (e.g., courting, nesting, feeding patterns).		
<b>Advanced</b>	<b>Proficient</b>	<b>Partially Proficient</b>	<b>Novice</b>
Explain and give examples of how different organisms' behaviors are determined by their environments	Describe how an organism's behavior is determined by its environment	Identify a way that an organism's behavior is influenced by its environment	Recognize that an organism's behavior is influenced by its environment
<b>Topic</b>	Unity and Diversity		
<b>Benchmark SC.4.5.2</b>	Describe the roles of various organisms in the same environment		



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<b>Sample Performance Assessment (SPA)</b>	The student: Describes the roles (e.g., decomposers, producers, consumers) of various organisms that inhabit the same environment.		
<b>Advanced</b>	<b>Proficient</b>	<b>Partially Proficient</b>	<b>Novice</b>
Analyze how the roles of different organisms affect their interaction in the same environment	Describe the roles of various organisms in the same environment	Identify a few organisms and their role in the same environment	Recall, with assistance, very few organisms and their role in the same environment
<b>Topic</b>	Unity and Diversity		
<b>Benchmark SC.4.5.3</b>	Describe how different organisms need specific environmental conditions to survive		
<b>Sample Performance Assessment (SPA)</b>	The student: Illustrates and explains how specific environmental conditions support the survival of specific organisms.		
<b>Advanced</b>	<b>Proficient</b>	<b>Partially Proficient</b>	<b>Novice</b>
Explain why different organisms need specific environmental conditions to survive	Describe how different organisms need specific environmental conditions to survive	List specific environmental conditions that organisms need to survive	Recall that organisms need specific environmental conditions to survive

*Lessons Summary*

Lesson Day #	Lesson Title	What students will be able to know, do & understand
Harcourt Text	Chapter 4 Understanding Ecosystems	Pre-test
	Lesson 1	What are Parts of an Ecosystem? Text pp. 130-137 <ul style="list-style-type: none"> <li>• Understanding Ecosystems “Vocabulary Power”</li> <li>• Lesson Quick Study RS27-28</li> <li>• Use a creative writing prompt like “If you were on the moon what would you have in your ecosystem?”</li> <li>• “If I was an aquanaut...”</li> </ul>
	School yard Ecosystem Scavenger Hunt	Using notebook, students go out and collect ideas about different aspects within the school yard, come back and use notes and ideas to really define a simple ecosystem
	Lesson 2	What Factors Influence Ecosystems? Pp. 138-147 <ul style="list-style-type: none"> <li>• Lesson Quick Study RS29-30</li> <li>• Important vocabulary in this lesson – students had to think</li> <li>• Create an ecosystem of choice pamphlet</li> </ul>
	Water is a Valuable Resource	Social studies/science demo/lab lesson with water and the items that both humans and the earth contribute to the water. (Robin)
	Lesson 3 (4)	How Do Humans Affect Ecosystems? Pp. 148-155 <ul style="list-style-type: none"> <li>• Lesson Quick Study “Lesson 4” RS 31-32</li> <li>• Use some local examples to relate human interactions to things on this island (land erosion due to sugar can</li> </ul>



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		farming) <ul style="list-style-type: none"> <li>Show What you Know "Two Ecosystems (beach/forest)</li> </ul>
Option	Human Trash	Trash gyres, albatross bolus (Mokupa'apa'a) Check out the detective kit
Harcourt Text	Chapter 4 Understanding Ecosystems	Post-test
Harcourt Text	Chapter 5 Energy Transfer in Ecosystems	Pre-test
	Vocabulary Power	Energy Transfer in Ecosystems "Vocabulary Power"
OPTION	Decomposing Bananas LM65-67	Banana decomposition activity (baggies & banana slices) Yeast...bread Inquiry process skills incorporated into this homework lessons **note** put baggies on chair backs/tack up on bulletin boards
OPTION	Worm composting	<ul style="list-style-type: none"> <li>Read Peewee and the Magical Compost Heap by Lorraine Rouston</li> <li>Worms in the pepsi 2-liter bottle</li> </ul>
	Lesson 1	What are the Roles of Living Things text pp. 164-171 <ul style="list-style-type: none"> <li>Lesson Quick Study RS 34-35</li> <li>Roles of Living Things "Show What you Know (could use the notebook)</li> <li>Student notebook examples</li> </ul>
	Lesson 2	How Do Living Things Get Energy? Pp. 172-181 <ul style="list-style-type: none"> <li>Lesson Quick Study RS 36-37</li> <li>Student pyramid examples (booklets) or notecards to make student flip cards for food chains (look at BLOG)</li> </ul>
OPTIONAL	Project 3-D VIEW	"Full Circle" STORYBOOK (online) Student pp S-57 to S-59 are questions that students could be answering while they read the "interactive" story
OPTIONAL	Project 3-D VIEW	Lesson 8 – Biomes Quilt Lesson 9 = Biomes and Productivity
OPTIONAL	Project 3-D VIEW	Lesson 10 - Succession
RED/pink	<b>DIVIDER</b>	<b>STOP HERE – 7<sup>th</sup> grade will go from there</b> <b>Lessons 5-7</b>
OPTIONAL Teacher References	Project 3-D VIEW	Lesson 5 – Tree of Life Lesson 6 – Producers Harnessing the Sun Lesson 7 – Consumers & Their Ecosystems
Harcourt Text	Chapter 5 Energy Transfer in Ecosystems	Post-test



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Ohia Project	Hot Spot! (1-2 lessons without extension activities)	EGG Demo – shell of the hard-boiled egg is like the crust, white is like the mantle and the yoke is like the core (same size ratios as the layers of the earth) Pacific plate movements and types of boundaries (how to use a key). Mo'olelo – Mau'i and Pele legends connected to social studies Student activity sheet (color code the activity) and answer questions
Ohia Project	Getting to Know a Volcano (2 lessons with extensions)	OPTIONAL – THIS SUPPORTS EXTENSION LEARNING AND VOCABULARY (also field trip to Kilauea)  Shield volcanoes, cinder cones, features within, types of lava
Ohia Project	Dispersal Bingo	Introduction: Use the Student Atlas of Hawai'i (Juvik, Paradise & Juvik) <ul style="list-style-type: none"> <li>• Talk about endemic, indigenous, introduced species</li> <li>• Talk about where Hawaii is located</li> <li>• List of dispersal methods by each student – prompt towards the more difficult methods or descriptions of seeds (waxy, hard coating) pp. 28-29</li> </ul>
Ohia Project	Incredible Invertebrates	<ul style="list-style-type: none"> <li>• Share the student information – create 5 “cards” for each group. Students complete “student activity sheet” – added extra column for the adaptations – students can find 2 “bugs”</li> <li>• Provide a list of “zones” on the board (not in order)</li> <li>• Zone versus habitat (word bank – ecosystem under a rock)</li> <li>• Students create an incredible invertebrate, or plant or animal that would be adapted to an island zone (possibly assign as homework)</li> </ul>
Ohia Project	A Wild Wetland Journey  (Fun for P.E.)	** Leeann’s modification on the game (slideshow on the Frameworks BLOG) Teacher will read a story that includes the characters of the game VOICES of THE RAINFOREST (DVD) - optional Student Activity Sheet – find the hidden mongoose, then answer the prompt – possibly remove large “talk bubble” and let students create their own talk bubbles from the mouths of the coot and the stilt. GAME (outside) – directions with Leeann modifications: Get bells now (jingle bells/hobby bells) – big bows of curling ribbon with bells on feet (need scissors for removal later) Small groups (5 in a group) spread them out – determine team captain so that “no cheating”



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		<p>Really good blindfold, golf ball for egg (cannot hold golf ball between feet), something for the nest (cone, spot)            Group spreads out as a horseshoe in front of the PREY            Swap out prey after they are "eaten"            Ask the predator/prey questions to debrief            Homework: draw a picture with predator/prey (land animals)</p>
Ohia Project	The Stream Team (LONG 4-5 sessions)	<p>Same animals as the prior lesson – game environment with stream animal adaptations            Does showcase the cycle of energy in the stream environment</p> <p>I ke pono lessons from Dorothy (social studies link)            "Water is a Precious Resource"</p>
Ohia Project	From the Mountain to the Sea	<p>Connection to the social studies (ahu pua'a – uka, kula, kai).            Divide larger construction paper into a 3-section foldable booklet.</p> <p>Vegetation zones for ahu pua'a – students research all three zones: types of plants &amp; animals, describe the land features, kinds of activities people did there (adze)</p> <p>From the Mountain to the Sea –            p. 9 Umi Divides the land            p. 10 Moku of Hawaii island            p. 12-17 Ahupua'a            p.18-21 Uka – Mt or upland            p. 21-24 Kula – plains &amp; fields            p. 25-29 Kai - sea</p>

**Resources:**

Kidshealth.org (how energy enters the cells of the body)

Discoveryeducation.com (lots of fossils)

<http://library.thinkquest.org/I001402F/> (scientific method process skills)

teleschool link to get DVD's of all lessons

[www.video.k12.hi.us/express-video-ordering](http://www.video.k12.hi.us/express-video-ordering) (search by key words)