

# ALOHA 'ĀINA

## GRADE 7 CORAL REEFS

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*'Ike I ke au nui, me ke au iki.*

Know the big currents and the little currents.

Is very well versed.

*(Mary Kawena Pukui 'Ōlelo No'eau No. 1209)*

Value emphasized in this unit: *Hō'ihī* (Respect)

How are human activities affecting coral reefs in Kāne'ohe Bay and what can we do to *hō'ihī* (respect) the bay and promote sustainability?



## CORAL REEFS

*"Hanau ka 'Uku-ko'ako'a, Hanau kana, he  
Ako'ako'a, puka"*

[Born the coral polyp, Born of him a coral colony  
emerged]

- (*Kumulipo, The Hawaiian Hymn of Creation*,  
compiled by Rubellite Kawena Johnson, 1981).

*He pūko'a kani 'āina.*

A coral reef that grows into an island.

A person beginning in a small way gains  
steadily until he becomes firmly established.

(*Mary Kawena Pukui*,  
'Ōlelo No'eau No. 932)

Like a coral reef growing into an island, this unit investigation of Kāne'ohe Bay provides an opportunity for students to gain steadily in their knowledge until their respect for the special qualities of the bay becomes firmly established.



Kāne'ohe Bay is indeed a special place. As the largest sheltered body of water in the Hawaiian Islands, the bay is home to fringing reefs around the shoreline and more than 40 patch reefs that grow in its

calm waters (SOEST, 2001). A large barrier reef across the seaward edge of the bay protects the many coral reefs from trade wind swells.

The calm waters of the bay, its protected shorelines, and the many streams feeding into the coastline, provided ideal conditions for the development of shoreline *loko i'a* (fishponds). Early Hawaiians recognized these favorable conditions and constructed at least 30 fishponds around the bay (Jokiel, n.d.). Today most of those fishponds have been filled with material dredged from reefs as the coastline was developed. The few ponds that remain remind us of the ingenuity of the Hawaiians who engineered this early form of aquaculture. The old rock walls of the remaining *loko i'a* have withstood the elements and many forces of change over time.

### THREATS TO THE BAY

Today the play of light on the multi-hued water of the bay with its numerous patch and fringing reefs, and offshore islets combine to create a breathtaking vista. However, beneath this surface beauty, lie a number of threats to the sustainability of Kāne'ohe Bay.

Early accounts of the bay from the 1800s describe a crystal clear lagoon with abundant fish and corals and white sand beaches along the shoreline. As anyone who enjoys the bay can attest, this early description provides only a benchmark of what was and what we might strive to achieve in the future. Today the combination of sedimentation, pollution, alien species, overfishing, and marine



debris all threaten the health and diversity of the bay's reefs.

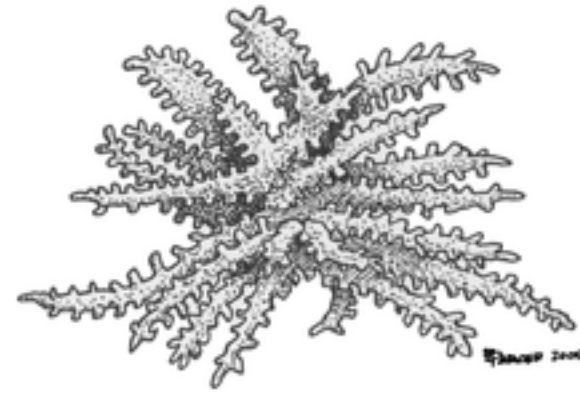
### SEDIMENTS AND POLLUTANTS

Extensive sedimentation of the bay began in the 1940s when sugar and pineapple plantations left soil exposed to heavy rainfall. In the 1970s, increased development of the area for homes and businesses caused extensive run-off of soil into the bay. Channelization of streams to control flooding around the developed areas also increased run-off of soil and nutrients, such as nitrates and phosphates, into the bay during heavy rainfall. Erosion from cattle ranching in the hills around He'eia added to the sedimentation and accumulation of nitrates in the water.

Human development also caused pollution of the water from sewage disposal. A sewage outfall constructed by the Kāne'ohe Marine Corps Air Station in 1951 in the southern part of the bay dumped virtually untreated sewage directly into the water until 1972 (Jokiel, n.d.). Two secondary wastewater treatment plants were subsequently constructed; one in Kāne'ohe and one in Ahuimanu. These plants discharged treated sewage into the bay, which contributed to the buildup of nutrients and sediments that were killing the reefs. The nutrient-enriched waters stimulated the growth of phytoplankton, which decreased the clarity of the water. Green bubble algae (*Dictyosphaeria cavernosa*) also began to grow rapidly with the increase in nutrients. The algae displaced corals and disrupted the natural balance of the coral reef ecosystem.

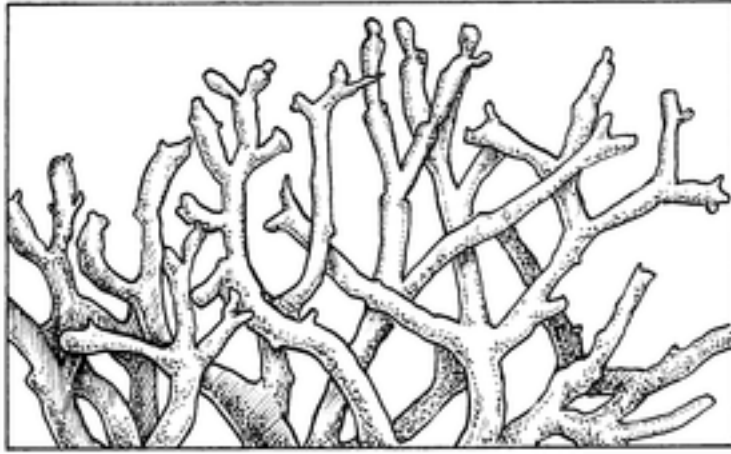
In 1978, the sewage outfall from Kāne'ohe was diverted to farther offshore of Mōkapu Point. A study of the bay from January 1976 through August 1979 showed that after the sewage diversion the water clarity improved more rapidly than expected although the coral community recovered more gradually (HWEA, n.d.).

### OVERFISHING AND ALIEN SPECIES



smothering seaweed  
(*Kappaphycus* spp.)

When nutrients, such as nitrates from human sewage and lawn or golf course fertilizers, wash onto the reef, conditions are favorable for the fleshy *limu* species, such as green bubble algae to grow more rapidly. In addition, since 1950, there have been 18 different species of *limu* introduced to O'ahu, some intentionally for aquaculture research, and others accidentally on ship hulls (Russell, 1992). Five of those species have become highly invasive, including *Acanthophora spicifera*, *Gracilaria salicornia*, *Kappaphycus* spp., *Hypnea musciformis*, and *Avrainvillea amadelpha* (Smith, 2002).



gorilla ogo  
(*Gracilaria salicornia*)

Another factor that contributes to the invasion of *limu* species and the degradation of the reef is overfishing. The Department of Natural Resources, Division of Aquatic Resources (DLNR/DAR) requires commercial fishers to file fish catch reports, which helps the agency to monitor the resources. DAR reports that there has been a significant decrease in the abundance of inshore marine resources over the past three decades (DLNR/DAR, 2005). When herbivorous fish that help to control the growth of *limu* are overfished, this affects the balance of the coral reef.

### GILL NETS

“Lay gill nets are monofilament meshing that can be strung together for hundreds, even thousands of feet and indiscriminately kill huge numbers of fish and other marine life with no regard to species, age, or season. Lay gill nets destroy habitat. They damage coral and sea grass beds, destroy critical nursery, foraging, spawning, and refuge areas for fish and shellfish. At times, massive nets drift away with the current or are forgotten, entangling endangered monk seals, sea turtles, and a range of other

marine life. Common practice is to leave nets unattended in nearshore waters for long hours and often overnight. Lay gill nets have severely damaged our coral reef ecosystems and depleted (our) fish stocks” (KAHEA, 2006).

In March, 2007, Governor Linda Lingle signed lay gill net restrictions into law. The law:

- Eliminates all lay gill nets around the island of Maui and three much depleted areas on O’ahu, and restricts use of the nets statewide;
- Prohibits the setting of lay gill nets overnight;
- Limits their length to 125 feet and mesh size;
- Requires nets to be registered and marked;
- Requires that nets not be left unattended for more than 30 minutes (Fair Catch Hawaii).

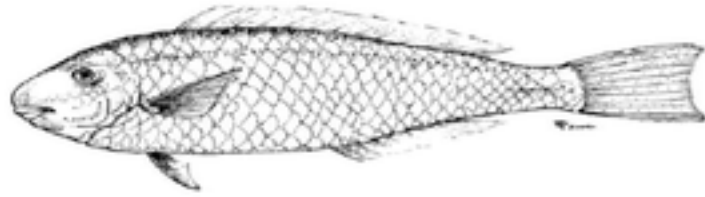
### MARINE DEBRIS

According to the National Oceanic and Atmospheric Administration (NOAA), Marine debris is typically defined as any man-made object discarded, disposed of, or abandoned that enters the coastal or marine environment. It may enter directly from a ship, or indirectly when washed out to sea via rivers, streams and storm drains”.

“Marine debris is a historical problem that is continuing to grow. Every year, marine debris injures and kills marine mammals, interferes with navigation safety, has adverse economic impacts to shipping and coastal industries, and poses a threat to human health. Our oceans and waterways are constantly polluted with a wide variety



of marine debris ranging from soda cans and plastic bags to derelict fishing gear and abandoned vessels” (NOAA, 2007).



*uhu* (parrotfish)  
(*Scarus perspicillatus*)

### OCEAN ACIDIFICATION

In addition to all of these threats, the issue of global warming is recognized to have an impact on the acidity of ocean water, which affects coral reefs. Approximately one-third of the carbon dioxide emitted into the atmosphere from fossil fuel burning and other human activities is absorbed into the ocean each year. Since the beginning of the industrial revolution the pH (acidity) of the surface water of the oceans has decreased by about 0.1 units (IUCN and TNC, 2008). The reefs are directly affected because the carbon in the carbon dioxide forms carbonic acid in seawater. Corals need calcium to grow, so with the calcium diminished, coral reef growth declines. If the acidity of the seawater increases past a certain threshold, the calcium in existing reefs can actually be dissolved.

According to the IUCN and TNC report (2008) “The best evidence to date suggests that skeletal growth of most corals will decrease by about 30% once atmospheric CO<sub>2</sub> concentration reaches 560 ppm, and that many reefs will shift from a reef-growth to a reef-erosion state before that,

particularly where reef-building corals have declined due to bleaching, disease and other factors.”

### ALOHA 'ĀINA

Early Hawaiians recognized the direct connection between human activities on land and the health of the ocean environment. The nine *ahupua'a* (land units) that surround Kāne'ohe Bay extend from the mountain summits out to the reefs. From the Hawaiian perspective, the guiding principle of *aloha 'āina* leads to caring for resources and limiting harvesting from the land or sea to only what is needed for survival. The ocean is viewed as an integral part of the 'āina, not as separate from land. And land is viewed as “chief”.

### UNIT OVERVIEW

The essential question addressed in this unit is: How are human activities affecting coral reefs in Kāne'ohe Bay and what can we do to *hō'ihi* (respect) the bay and promote sustainability? Students explore this question by building their knowledge about the bay's reefs and the interdependence of coral reef organisms as well as the integral relationship between the land and sea. During the unit, students work in groups to research one of the human impacts on the bay. Groups then present their research to the community to help spread the word about caring for the bay.

In the first lesson, **Fishing Links**, students explore relationships among coral reef organisms and Hawaiian 'aumakua (family guardians). They also reflect on their own relationship to the marine environment.



After viewing a video clip of fish in the new Papahānaumokuākea Marine National Monument in the Northwestern Hawaiian Islands, students play a “Fishing Links” game using coral reef cards to make food chains.

In the second lesson, **Passing on the Energy**, students conduct a demonstration of the flow of energy in a coral reef food chain compared to a Hawaiian fishpond food chain.

The third lesson, **Are We Related?** challenges teams of students to apply clues about features of organisms to identify and explain how scientists organize species by phylum. They play a phylum fishing card game to reinforce what they have learned about organisms in different phyla in Kāneʻohe Bay.

In the fourth lesson, **Looking to the Kūpuna (Elders)**, students work in teams, each researching the major findings from expeditions in the Northwestern Hawaiian Islands. They share their findings with the class and draw conclusions about what the “kūpuna” islands can teach us about the coral reefs in the main Hawaiian Islands.

In the next lesson, students work in teams to begin solving **The Case of the Invaded Reef**. Their challenge is to determine what is invading the reefs and the factors that caused the invasion to occur. As part of their investigation, students interview fishers and read background information related to the “case”.

The culminating activity, **The Case of the Invaded Reef, Part 2**, challenges students to

put their scientific investigative skills into action. Students collect evidence in a field study at Moku o Loʻe (Coconut Island), Hawaiʻi Institute of Marine Biology, to complete the investigations they began in Lesson 4. As a culminating activity, students write a persuasive paper applying what they’ve learned in the unit to take a stance on what is affecting the future health of the Kāneʻohe Bay and what can be done to *hōʻihi* (respect) this magnificent natural resource.

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<p><b>Unit Essential Question:</b> How are human activities affecting coral reefs in Kāne’ohe Bay and what can we do to <i>hō’ihi</i> (respect) the bay and promote sustainability?</p> <p><b>Project:</b> Students investigate how human activities are affecting coral reefs in Kāne’ohe Bay and conduct a project to demonstrate aloha <i>‘āina</i>.</p>	<p><b>Student Products:</b> Learning Logs with completed student sheets, drawings, diagrams, papers, reflections, booklets, self-assessments, case report and culminating activity product</p> <p><b>Culminating Activity:</b> Students share what they have learned about the need to care for the bay with others in the community. (Projects may take the form of PSAs, songs, children’s stories, or computer presentations.)</p> <p><b>Value Emphasized:</b> <i>Hō’ihi</i> (Respect)</p>
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**1. Fishing Links**  
How are coral reef organisms dependent on one another for survival?

Hawai’i DOE Standards and General Learner Outcomes (GLOs)	Hawai’i DOE Benchmarks, GLOs, and <i>Nā Honua Maui Ola</i> (NHMO)	Key Concepts	Assessment
<p><b>Science 3: Life and Environmental Sciences</b> <b>ORGANISMS AND THE ENVIRONMENT</b> Cycles of Matter and Energy</p> <p><b>Language Arts 4: Writing CONVENTIONS AND SKILLS</b> Range of Writing</p> <p><b>Language Arts 3: Reading LITERARY RESPONSE AND ANALYSIS</b> Critical Stance</p>	<p><b>SC.7.3.2:</b> Explain the interaction and dependence of organisms on one another.</p> <p><b>LA.7.4.1:</b> Write in a variety of grade-appropriate formats for a variety of purposes and audiences.</p> <p><b>NHMO: 8-4</b> Apply cultural and traditional knowledge of the past to the present.</p>	<p>Coral reef organisms are dependent on one another in a number of ways including predator/prey relationships, parasitism, and mutually beneficial symbiotic relationships.</p> <p>Apex predators at the top of the food chain are found in greater numbers in healthy reef ecosystems.</p> <p>Hawaiians had personal and spiritual relationships with land and sea organisms that represented their family <i>‘aumakua</i> (spiritual guardians). The names of these particular family <i>‘aumakua</i> are still passed from generation to generation.</p>	<p>Complete Learning Logs that show how organisms are interdependent, and b) compares and contrasts predator/prey and symbiotic relationships in the coral reef community.</p> <p>Write a reflection about their personal relationship with the marine environment.</p>





<p align="center"><b>2. Passing on the Energy</b></p> <p align="center">How much energy and matter is available at different steps in an ocean food chain and how does this relate to harvesting fish?</p>			
<p align="center"><b>DOE Standards and General Learner Outcomes (GLOs)</b></p>	<p align="center"><b>Hawai'i DOE Benchmarks, GLOs, and <i>Nā Honua Mauli Ola</i> (NHMO)</b></p>	<p align="center"><b>Key Concepts</b></p>	<p align="center"><b>Assessment</b></p>
<p><b>Science 3: Life and Environmental Sciences</b> <b>ORGANISMS AND THE ENVIRONMENT</b> Cycles of Matter and Energy</p> <p><b>Math 1: Numbers and Operations</b> <b>NUMBER SENSE</b> Numbers and Number Systems</p>	<p><b>SC.7.3.1:</b> Explain how energy moves through food webs, including the roles of photosynthesis and cellular respiration.</p> <p><b>SC.7.3.2:</b> Explain the interaction and dependence of organisms on one another.</p> <p><b>MA.7.1.1:</b> Solve problems using fractions, decimals, and percents.</p> <p><b>NHMO 1-8</b> Understand and appreciate the importance of Hawaiian cultural traditions, language, history, and values.</p>	<p>Organisms are linked to each other through the cycling of matter and flow of energy through food chains.</p> <p>Organisms need energy for life functions such as growth, respiration, and reproduction.</p> <p>Energy is not destroyed as it moves through a food chain; it is just converted from an ordered, concentrated form such as the chemical energy in food, into a more dispersed and less useable form such as heat energy.</p> <p>Since energy is lost at each level in a food chain, Hawaiian fishponds are an ingenious and efficient way of producing fish.</p>	<p>Write an explanation of how energy moves through the coral reef food chain, including the percentage of energy used at each level and the roles of photosynthesis and cellular respiration.</p> <p>Explain how organisms in a coral reef food web are dependent on one another.</p> <p>Use representations, models, equivalent forms, or other appropriate strategies to solve problems that involve fractions, decimals, or percents.</p>
<p align="center"><b>3. Are We Related?</b></p> <p align="center">How do we classify marine organisms by their degree of relatedness?</p>			
<p><b>Science 4: Life and Environmental Sciences:</b> <b>STRUCTURE AND FUNCTIONING IN ORGANISMS</b> Classification</p>	<p><b>SC.7.4.4:</b> Classify organisms according to their degree of relatedness.</p>	<p>Organisms can be classified according to similarities in their anatomical features.</p>	<p>Complete a phylum booklet with illustrations that depict at least two organisms from each phylum studied.</p>





4. Looking to the <i>Kūpuna</i> (Elders)			
What do older coral reefs in the Northwestern Hawaiian Islands (NWHI) reveal about changes to reefs in the Main Hawaiian Islands (MHI) over time?			
Hawai'i DOE Standards and General Learner Outcomes (GLOs)	Hawai'i DOE Benchmarks, GLOs, and <i>Nā Honua Mauli Ola</i> (NHMO)	Key Concepts	Assessment
<p><b>Science 1: The Scientific Process: SCIENTIFIC INVESTIGATION</b> Scientific Inquiry</p> <p><b>Science 2: The Scientific Process: NATURE OF SCIENCE</b> Science, Technology, and Society</p> <p><b>Language Arts 1: Reading: CONVENTIONS AND SKILLS</b> Locating Sources/Gathering Information</p>	<p><b>SC.7.1.3:</b> Explain the need to revise conclusions and explanations based on new scientific evidence.</p> <p><b>SC.7.2.1:</b> Explain the use of reliable print and electronic sources to provide scientific information and evidence.</p> <p><b>LA.7.1.2:</b> Use a variety of grade-appropriate print and online sources to research an inquiry question.</p>	<p>Evidence from NOWRAMP excursions has revealed that apex predators are much more dominant in the reefs of the NWHI compared to the MHI.</p> <p>Scientific evidence reveals that the biomass of the coral reefs in the NWHI is much greater than the biomass of the reefs in the MHI.</p> <p>Over the years, there tends to be a shifting baseline for healthy, balanced reefs due to gradual human impacts over time. The reefs of the NWHI provide a baseline by which we can measure change in the MHI reefs brought on by human activities such as overfishing, pollution, and the introduction of invasive species.</p>	<p>Using scientific data from the NOWRAMP expedition, write a comparison of the reefs of the NWHI and the reefs of the MHI.</p> <p>Explain what a shifting baseline for the reefs of the MHI is and describe how scientific evidence from the NWHI causes us to revise conclusions about our reefs in the MHI.</p>
5. The Case of the Invaded Reef - Part 1			
What is invading coral reefs in Kāne'ohe Bay and how are human activities contributing to the problem?			
<p><b>Science 1: The Scientific Process SCIENTIFIC INVESTIGATION</b> Scientific Inquiry</p> <p><b>Language Arts 5: Writing RHETORIC</b> Meaning</p>	<p><b>SC.7.1.1:</b> Design and safely conduct a scientific investigation to answer a question or test a hypothesis.</p> <p><b>LA.7.5.1:</b> Connect selected details, examples, reasons, and/or facts to the insight, message, or thesis in a meaningful way.</p>	<p>Coral reefs in Kāne'ohe Bay are being invaded by alien and invasive native <i>limu</i> species.</p> <p>The invasion of <i>limu</i> on the coral reefs is due to a number of factors including overfishing, introduction of non-native <i>limu</i>, and run-off of pollutants from surrounding communities.</p>	<p>Students complete Learning Log 6 with a description of their hypotheses and the method they will use in their investigation.</p>



<b>6. The Case of the Invaded Reef - Part 2</b> How are human activities affecting coral reefs in Kāne'ōhe Bay and what can we do to <i>hō'ihi</i> (respect) the bay and promote sustainability?			
Hawai'i DOE Standards and General Learner Outcomes (GLOs)	Hawai'i DOE Benchmarks, GLOs, and <i>Nā Honua Mauli Ola</i> (NHMO)	Key Concepts	Assessment
<p><b>Science 1: The Scientific Process SCIENTIFIC INVESTIGATION</b> Scientific Inquiry</p> <p><b>Science 3: Life and Environmental Sciences ORGANISMS AND THE ENVIRONMENT</b> Cycles of Matter and Energy</p> <p><b>Math 11: Data Analysis, Statistics, and Probability FLUENCY WITH DATA</b> Data Collection and Representation</p> <p><b>Language Arts 4: Writing CONVENTIONS AND SKILLS</b> Citing Sources</p> <p><b>Language Arts 5: Writing RHETORIC</b> Meaning</p>	<p><b>SC.7.1.1:</b> Design and safely conduct a scientific investigation to answer a question or test a hypothesis.</p> <p><b>SC.7.1.2:</b> Explain the importance of replicable trials.</p> <p><b>SC.7.3.3:</b> Explain how biotic and abiotic factors affect the carrying capacity and sustainability of an ecosystem.</p> <p><b>MA.7.11.1:</b> Design a study, collect data, and select the appropriate representation (line graph, bar graph, circle graph, histogram, stem and leaf plot, box and whisker plot) to display the data.</p> <p><b>LA 7.4.5:</b> Cite various grade-appropriate sources using a consistent format when reporting information.</p> <p><b>LA.7.5.1:</b> Connect selected details, examples, reasons, and /or facts to the insight, message, or thesis in a meaningful way.</p>	<p>The invasion of <i>limu</i> on the coral reefs is due to a number of factors including overfishing, introduction of non-native <i>limu</i>, and run-off of pollutants from surrounding communities.</p> <p>There are different ways to display our data so that we can interpret our findings, draw conclusions, and show how the conclusions are linked to the data.</p> <p><i>Ma ka hana ka 'ike</i> By doing one learns</p>	<p>Complete Learning Logs with written conclusions from their investigation, including adjustments based on evidence, and the importance of replicable trials.</p> <p>Display data collected in tables and graphs.</p> <p>Complete a culminating paper that answers the essential question for the unit.</p>

**GRADE 7 UNIT MAP**

**CORAL REEFS**

Hawai'i DOE Standards and General Learner Outcomes (GLOs)	Hawai'i DOE Benchmarks, GLOs, and <i>Nā Honua Mauli Ola</i> (NHMO)	Key Concepts	Assessment
<p>Language Arts 6: Oral Communication  <b>CONVENTIONS AND SKILLS</b>                      Discussion and Presentation</p> <p><b>GLO 2: Community Contributor</b></p> <p><b>GLO 5: Effective Communicator</b></p>	<p><b>LA.7.6.2:</b> Give short prepared oral presentations incorporating information from research to inform and persuade.</p> <p><b>GLO 2:</b> Cooperate with and help and encourage others in group situations.</p> <p><b>GLO 5:</b> Communicate effectively and clearly through speaking, using appropriate forms, conventions, and styles to convey ideas and information.</p> <p><b>NHMO 14-1:</b> Be keen observers of their natural environment.</p> <p><b>NHMO 14-6:</b> Honor and respect personal and community resources.</p> <p><b>NHMO 14-10:</b> Preserve, protect and sustain a healthy environment.</p>	<p>We can promote sustainability by sharing what we have learned with others and by actions such as fishing responsibly, preventing the spread of alien <i>limu</i>, and preventing pollution.</p>	<p>Work with their teammates to present their unit project about the bay to others in the school or community.</p>



**RUBRIC FOR INDIVIDUAL CULMINATING PAPER** - How are human activities affecting coral reefs in Kāne'ōhe Bay and what can we do to *hō'ihī* (respect) the bay and promote sustainability?

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_ TOTAL POINTS: \_\_\_\_\_

Hawai'i DOE Benchmarks, GLOs, and <i>Nā Honua Mauli Ola</i> (NHMO)	<i>Kūlia</i> (Exceeds Standard) ____ Points	<i>Mākaukau</i> (Meets Standard) ____ Points	<i>'Ano Mākaukau</i> (Almost at Standard) ____ Points	<i>Mākaukau 'Ole</i> (Below Standard) ____ Points
<p><b>Language Arts 5: Writing Clarity and Design</b> Is my writing organized, focused and clear? Did I write an introductory paragraph that clearly states what I cover in my paper? Did my conclusion clearly summarize the problem and solutions? <i>Points:</i>_____</p>	My writing is focused. My key points are very clearly stated in an organized way.	My writing is organized and clear. I make my key points in a way that is easy to follow.	I have some good ideas but I did not organize them before I started to write. It is difficult to understand what I'm trying to say.	My writing is not organized. I'm not sure of what I'm trying to say or how to say it.
<p><b>Language Arts: 4 and 5: Writing Citing Sources and Meaning</b> Did I state what should be done to show <i>hō'ihī</i> (respect) for Kāne'ōhe Bay and why? Did I use information from at least three sources and cite them correctly? <i>Points:</i>_____</p>	My paper states a number of ways that we should show <i>hō'ihī</i> (respect) for Kāne'ōhe Bay and clearly states why. I used information from more than three sources.	My paper states what should be done to show <i>hō'ihī</i> (respect) for Kāne'ōhe Bay and why. I used information from three sources.	My paper describes what we should do to respect the bay but doesn't describe why. I have at least one source of information.	My paper doesn't support a stance about the bay. I don't have information from different sources.
<p><b>Science 3: Organisms and the Environment: Interdependence and NHMO 14-10</b> Did I include at least two paragraphs to describe the problem? Did I thoughtfully and accurately explain how human activities today could affect future generations' ability to use the bay (sustainability)? <i>Points:</i>_____</p>	I clearly explained how both biotic and abiotic factors affect the sustainability of the bay.	I explained how human activities are affecting the bay today and how this could affect use of the bay in the future.	I explained how human activities are affecting the bay, but I didn't address the future.	I haven't figured this out yet.





<p><b>Language Arts 4: Writing Conventions and Skills</b></p> <p>Did I correct my spelling, punctuation and grammar?</p> <p><b>Points:</b>_____</p>	<p>My paper has no errors in spelling, punctuation or grammar!</p>	<p>My final paper is almost free of spelling, punctuation and grammatical errors.</p>	<p>I corrected some of my spelling, punctuation and grammatical errors, but not all of them.</p>	<p>I never revised my paper to correct errors in spelling, punctuation or grammar.</p>
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**RUBRIC FOR GROUP CULMINATING PROJECT AND PRESENTATION** - How are human activities affecting coral reefs in Kāne’ohe Bay and what can we do to *hō’ihi* (respect) the bay and promote sustainability?

TEAM MEMBERS: \_\_\_\_\_ DATE: \_\_\_\_\_ TOTAL POINTS: \_\_\_\_\_

Hawai’i DOE Benchmarks, GLOs, and <i>Nā Honua Mauli Ola</i> (NHMO)	<i>Kūlia</i> (Exceeds Standard) ____ Points	<i>Mākaukau</i> (Meets Standard) ____ Points	<i>‘Ano Mākaukau</i> (Almost at Standard) ____ Points	<i>Mākaukau ‘Ole</i> (Below Standard) ____ Points
<p><b>GLO 2: Community Contributor</b> Team members helped and encouraged one another to produce good quality visual aids for the presentation.</p> <p><i>Points:</i> _____</p>	Excellent use of photographs, computer-generated or handmade visual aids to enhance presentation and clarify main points.	Good use of photographs, computer-generated or handmade visual aids to illustrate key ideas.	Use of additional visuals or higher quality visual aids would help illustrate key points.	Visual aids were poor quality and/or not closely related to key points.
<p><b>GLO 5: Effective Communicator</b> Team members communicated information clearly and logically. All major points were fully explained.</p> <p><i>Points:</i> _____</p>	Your presentation was very organized. The team explained major points and provided great examples to clarify ideas.	Good organization and explanation of major ideas.	Organization was beginning to show in team presentation, but needs work to have a flow of logic.	Team needs to spend time on organization so that your major points can be understood.
<p><b>GLO 5: Effective Communicator</b> Team members communicated effectively and clearly through speaking, using appropriate forms, conventions, and styles to share ideas.</p> <p><i>Points:</i> _____</p>	You really connected with the audience. You demonstrated confidence by making eye contact, facing the audience, standing straight, speaking clearly and using appropriate gestures.	Team spoke loud enough for people to hear and made eye contact with the audience. Your straight posture demonstrated confidence.	Team communicated clearly for some of presentation. Delivery was better when there was eye contact with the audience.	Team did not communicate clearly. You spoke too softly and did not make eye contact with the audience.
<p><b>Language Arts 6: Oral Communication</b> <b>Science 3: Organisms and the Environment and NHMO: 14-10</b></p> <p>Team presentation showed good understanding of the ways that human activities are affecting coral reefs and what can be done to promote sustainability.</p> <p><i>Points:</i> _____</p>	Your team was very informed about the effects of human activities on the reef and what can be done to promote sustainability. Very little reference to notes made for a smooth presentation. <i>Maika’i!</i>	Knowledge of content was evident in your presentation. Your presentation was well organized with brief reference to notes.	Your team used notes too frequently and paused too often in delivery of information. It appeared that you did not know the content well.	Your presentation was read so team did not seem prepared or knowledgeable.

