

A Teacher's Guide to Navigating Change

Grades 4 - 5
Second Edition



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Navigating Change



"No longer do we seek only the knowledge of how to voyage between islands. We seek lessons to carry home to our children - ways to inspire the present generation to love and preserve our Earth as a sanctuary for those who will inherit it."

—Nainoa Thompson

Navigator, Hōkūleʻa

Navigating Change

Navigating Change is a program of environmental awareness and education envisioned by Nainoa Thompson and the Polynesian Voyaging Society (PVS) and perpetuated by a partnership of private and government organizations. Its mission is to inspire and challenge educators and students to take actions in their classrooms and communities that perpetuate ocean and island health, thereby making Hawaiʻi a vital and sustainable environment for future generations. We hope to change behaviors by creating an awareness of the ecological problems we face and by demonstrating how decisions we make in our daily lives can help resolve those problems.

Participating partners are:

- Polynesian Voyaging Society (PVS)
- Bishop Museum (BM)
- U.S. Fish & Wildlife Service (FWS)
- National Oceanic and Atmospheric Administration (NOAA)
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For more information about Navigating Change educational projects, contact: Matt Limtiaco at matthew.limtiaco@noaa.gov or 271-1048.



Description of the Voyage to the “Kūpuna” Islands

To raise awareness of the environmental decline occurring in the main Hawaiian Islands, the Polynesian Voyaging Society (PVS) has sailed the double-hulled canoe Hōkūle‘a throughout the main Hawaiian Islands carrying the Navigating Change message. School children and entire communities were challenged to take responsibility for our natural environment. This statewide sail began in March 2003.

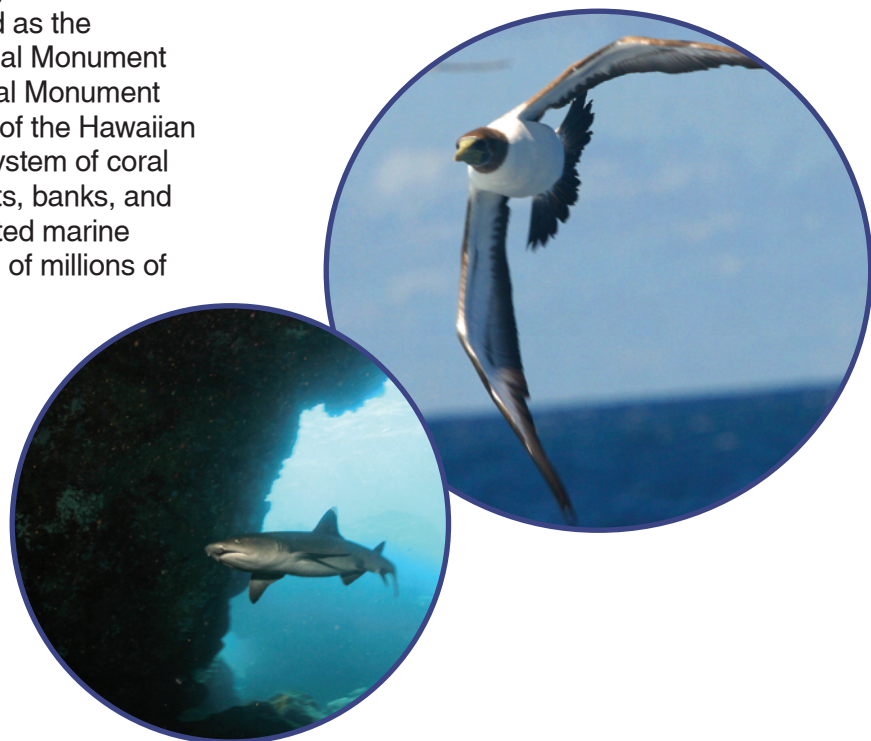
In May 2004, PVS sailed Hōkūle‘a along an ancient exploratory route to the Northwestern Hawaiian Islands (NWHI) to further examine the cultural and biological wonders of this unique and rarely seen coral reef ecosystem. These islands have recently been referred to as our “kūpuna” islands since they are geologically older than the main Hawaiian Islands and there is much we can learn from them. The islands provide a window into our past when our coral reefs were healthy and abundant with life. The “ancestral” leg of our journey took us to the islands of Nihoa and Mokumanamana (Necker), where cultural protocols set the stage for the rest of the voyage. The voyage then continued to the remaining Northwestern Hawaiian Islands. These islands revealed a rare sanctuary of natural beauty symbolized by the tiny coral polyp – the building block of life – according to the Hawaiian Creation Chant, *Kumulipo*.

Today these islands and surrounding marine ecosystem are now protected as the Papahānaumokuākea Marine National Monument (PNMM). This remote Marine National Monument includes the northern three quarters of the Hawaiian archipelago, a two million-acre ecosystem of coral reefs, atolls, small islands, seamounts, banks, and shoals. It is one of the largest protected marine areas on the planet. Over the course of millions of

years, erosion, subsidence, and coral reef growth have transformed once-high volcanic islands into the low-lying coral atolls and small basalt islands found here today. Where land and sea rely on each other for life, millions of seabirds nest, thousands of sea turtle eggs hatch, an abundance of sharks and large predatory fish thrive, thousands of marine species flourish, and endangered flora and fauna such as Laysan ducks and Hawaiian monk seals make their home. Countless numbers of native species, more than one quarter of which exist nowhere else on the planet, rely on this relatively undisturbed terrestrial and marine habitat.

While on the voyage to the NWHI, crew members aboard Hōkūle‘a communicated by satellite phone with students back home. Updates and information about this voyage are posted on www.pvs-hawaii.org and www.hawaiianatolls.org websites.

The goal of Navigating Change is to motivate, encourage, and challenge people to take action to improve the environmental conditions in their own backyards, especially as it pertains to our coral reefs. We want people to take responsibility for the stewardship and sustainability of our islands and our ocean. We are targeting our message to the youth of Hawai‘i because the future is in their hands.



Overview of the *Navigating Change Teacher's Guide*

This teacher's guide includes five units that are designed to help students explore their relationships to the environment and ways that they can "navigate change" in their own communities. The instructional activities focus on Hawai'i DOE science, social studies, math, and language arts standards as well as Nā Honua Mauli Ola, guidelines for culturally healthy and responsive learning environments in Hawai'i that were developed by the Native Hawaiian Education Council in partnership with the Ka Haka 'Ula O Ke'elikōlani, College of Hawaiian Language, UH-Hilo. The videotape that accompanies the guide has five segments, one for each unit of study. In addition, the accompanying CDs contain a wealth of reference material. A multitude of images and video clips are organized by various subject folders for teachers and students to utilize when creating their own presentations. The photo and resources CD also contains a beautiful NWHI slide show synced with Hawaiian music, short video segments highlighting management and research activities in the Papahānaumokuākea Marine National Monument, and a PowerPoint presentation. References to these resources are included in various units where they support the concepts that students are investigating.

The second edition of the teacher's guide features a new instructional activity to introduce students to the Monument in Unit 1 and new field investigations in Unit 5. All of the units have been updated to include journal pages for students. These pages are designed as a tool for formative assessment to determine how well the students are doing in meeting the Hawai'i DOE standards. By the end of the units, students will have journals that show their own voyage of discovery and document their ideas and concerns as they work to navigate change.

Unit 1: The Voyage



Hawai'i DOE Standards:

Social Studies 3: History: Pre-Contact Hawai'i History

Social Studies 6: Cultural Anthropology: Cultural Systems and Practices

Social Studies 7: Geography: World in Spatial Terms

Science 2: The Scientific Process: Nature of Science

Science 8: Earth and Space Science: Forces That Shape the Earth

Math 4: Measurement: Fluency with Measurement

Language Arts 4 - 5: Writing: Conventions and Skills

Nā Honua Mauli Ola:

1 - 8: Understand and appreciate the importance of Hawaiian cultural traditions, language, history, and values.

8 - 4: Apply the cultural and traditional knowledge of the past to the present.

This unit sets the stage by introducing students to the NWHI through a mapping activity. Students create a large wall map of the Hawaiian Islands archipelago and present geographical data about the NWHI to one another. The second instructional activity introduces students to the story of Papahānaumoku and Wākea and why the Papahānaumokuākea Marine National Monument is considered a sacred and significant area. The next activity helps students discover the fascinating story of our island volcanoes—from high islands to low-lying atolls. Students then explore what it would be like to take a voyage to a distant island. Along the way, they discover the feats of navigators and the importance of practicing values such as laulima (working together), kuleana (taking responsibility) and mālama (caring).

A wonderful way to supplement this unit is to take students to the Hawai'i Maritime Center where there is a full immersion hands-on exhibit about the NWHI. See <http://holoholo.org/maritime/> or call the Center at (808)523-6151.



Unit 2: Land to Sea Connections



Hawai'i DOE Standards:

Science 2: The Scientific Process: Nature of Science

Science 3: Life and Environmental Sciences: Organisms and the Environment

Science 5: Life and Environmental Sciences: Diversity, Genetics, and Evolution

Language Arts 4: Writing: Conventions and Skills

Language Arts 5: Writing: Meaning

Nā Honua Maui Ola

4 - 2: Acquire in-depth cultural knowledge through interaction with kūpuna.

14 - 8: Reflect on the relationship between the natural environment and people.

Unit 2 stresses the importance of the interconnection between land and sea as essential components of a healthy environment for many species of the NWHI, including ourselves. Students participate in a role-playing game that emphasizes the importance of land and sea to the survival of Hawaiian monk seals and green sea turtles.

Through this activity, students discover the interdependence of organisms for the exchange of oxygen, carbon dioxide, and nutrients; organisms' responses to a constantly changing environment; and the importance of specific environmental conditions for survival.

Unit 3: Change Over Time



Hawai'i DOE Standards:

Science 1: The Scientific Process: Scientific Investigation

Science 2: The Scientific Process: Nature of Science

Social Studies 1: History: Historical Understanding

Social Studies 7: Geography: World in Spatial Terms

Language Arts 6: Oral Communication: Conventions and Skills

Math 9: Patterns and Functional Relationships

Math 10: Patterns, Functions, and Algebra: Symbolic Representation

Nā Honua Maui Ola:

8 - 4: Apply the cultural and traditional knowledge of the past to the present.

8 - 12: Pursue opportunities to observe and listen to expert resources within the community.

15 - 1: Develop a sustainable food production system.

This unit lays the foundation for the last two units. Travel through time is simulated through a comparison between the reefs and islands of the NWHI and the main Hawaiian Islands. Students explore the differences between what the reefs and islands of the main Hawaiian Islands might have been and what they are now. They conduct a fishing demonstration to explore sustainable fishing practices and explore how traditional fishing

practices can be applied to our interaction with the ocean today. The unit includes a PowerPoint presentation that provides a baseline for comparing fish populations and sizes, and reef composition in the NWHI and main Hawaiian Islands. Throughout the unit, students are asked to keep track of all the differences they observe and build comparative models to show their understanding of the concept of change over time.

Unit 4: Human Impact



Hawai'i DOE Standards:

Science 1: The Scientific Process: Scientific Investigation

Science 2: The Scientific Process: Nature of Science

Social Studies 6: Cultural Anthropology: Cultural Systems and Practices

Language Arts 1: Reading: Conventions and Skills

Language Arts 2: Reading: Reading Comprehension

Language Arts 5: Writing: Rhetoric

Language Arts 7: Oral Communication: Rhetoric

Math 1: Numbers and Operations: Number Sense

Nā Honua Maui Ola:

15 - 3: Teach others about the concept of mālama through example.

15 - 4: Participate in conservation and recycling practices and activities.

This unit challenges students to comprehend both the negative and positive impacts humans have on coral reefs of the main Hawaiian Islands. Students reflect on how our use of tools and materials has changed since the days of old Hawai'i, and the ways in which our modern lifestyles have an impact on the environment. The way that some of those materials end up as marine debris and the impact of this debris on all wildlife becomes clear to students through a physically active game

and through a scientific investigation. Clues about seabirds and their habitat are revealed as students dissect a bolus and discover plastic materials that have ended up in a seabird. Through this scientific investigation, students become aware of the direct impact of human-made debris, particularly plastics, on the survival of seabirds. To culminate the unit, student teams create ways to reduce their impact on the land and sea and share their new knowledge with other classes in the school.

Unit 5: You Make a Difference



Hawai'i DOE Standards:

Social Studies 6: Cultural Anthropology: Cultural Dynamic/Change and Continuity

Social Studies 7: Geography: World in Spatial terms

Math 12: Data Analysis, Statistics, and Probability

Science 1: The Scientific Process: Nature of Science

Language Arts 5: Writing: Rhetoric

Language Arts 7: Oral Communication: Rhetoric

Nā Honua Maui Ola

14 - 1: Be keen observers of their natural environment.

5 - 3: Appreciate and respect the diverse views of others.

5 - 8: Become actively involved in local activities and organizations that contribute to the quality of life in their community.

The final unit encourages students to apply what they have learned by undertaking projects to mālama the environment. Field investigations to a Hawaiian fishpond and to a nearshore environment that is impacted by runoff from the land provide opportunities for students to

investigate human interactions with the 'āina and conduct community service. In the culminating activity, students are empowered to be part of the solution by navigating change for a healthier environment in their own ahupua'a.

Appendix

The Appendix includes additional readings and resources to supplement the units.