

The Mystery of Rapa Nui



Lesson at a Glance

Teams of students investigate evidence from field studies, ships' logs, and oral traditions to solve the mystery of what happened to the natural resources of Rapa Nui. Students present their findings to the class and discuss the ecological and cultural kinship Hawai'i has with Rapa Nui. Aunty Momi's journal helps students to reflect on ways that they can bring a sense of *lōkahi* (balance) into their lives and the responsibility that we have to use resources sustainably for future generations.

Focus Question

What caused the decline of natural resources and human population in Rapa Nui and what can we learn from our shared ecological and cultural kinship?

Key Concepts

- It is each generation's responsibility to use resources sustainably so that future generations will have the fresh water, soil, fisheries and other natural resources that they need.
- Hawai'i shares ecological and cultural kinship with other Pacific islands. We can cooperate with one another and share problems and successes for living sustainably.

Values

lōkahi (harmony, balance)

kuleana (responsibility)

hō`ihi (respect)

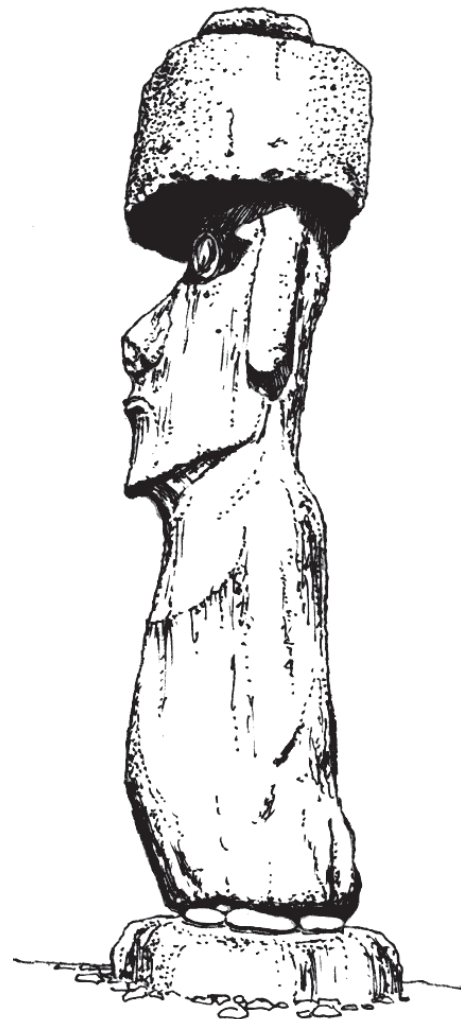
lokomaika`i (good hearted)

Time

three - four class periods

Performance Standards

- Identify human activities that may create changes resulting in unbalanced ecosystems.
- Depict information and relationships by constructing diagrams, charts, and graphs.
- Produce a narrative account that creates an organizing structure and establishes the significance of events.
- Demonstrate comprehension of text by writing about theme/author's message.
- Apply themes to own life experiences.





Subject Areas

science, social studies, language arts

Materials

Values illustrations (provided)

Momi's journal (provided)

Student activity sheet (provided)

Research materials: Ships' Logs (provided)
Oral Traditions (provided)
Field Work (provided)

Map of Rapa Nui (provided)

Additional references (listed at end of activity)



Preparation

- Make two or three copies of the research materials for student teams to use (Ships' Logs, Oral Traditions, Field Work).
- Make a copy of the student activity sheet and Aunty Momi's journal for each student.
- If possible, obtain some of the additional references suggested for Rapa Nui.

Note: Teachers who field tested this activity reported that the Let's Go Voyaging distance learning program, "Our, Island, Our Canoe" was extremely helpful to students as they solved the mystery

Teacher Background

Rapa Nui, also known as Easter Island, has always held a fascination for scientists and cultural enthusiasts. The island is known for its *moai*—the giant religious stone statues that were carved by the people in Rapa Nui during the 14th and 15th centuries. (Some may have been carved as early as the 10th century.) The largest of the *moai* is about 66 feet high and is estimated to weigh 300 tons! It was never completed and is still in the quarry. The largest *moai* on an *ahu* (raised stone platform) is just over 40 feet high. Today, many of these majestic statues are toppled over and the island's resources are just beginning to recover from environmental collapse. What is the story of Rapa Nui and how can we learn from it?

Rapa Nui, like Hawai'i, is very isolated; it is considered to be the most isolated high island ecosystem in the world. It is a tiny island approximately 2,400 miles off the Chilean coast. The nearest inhabited island is Pitcairn, to the northwest, 1,400 miles away. The nearest uninhabited islands are the low islets of Sala y Gomez to the east of Rapa Nui. Mangareva, 1,450 miles northwest of Pitcairn, was the nearest inhabited island in antiquity. The Marquesas

Islands, to the north of Mangareva, were probably the origin of the Polynesian migrations that settled both Rapa Nui and Hawai'i. (Refer to the Pacific Map in Appendix C.)

The island of Rapa Nui is about the size of Lāna'i. Politically it is part of Chile (Chilean Polynesia), however, despite Western influence, Rapa Nui has retained much of its Polynesian heritage, particularly its language. Rapa Nui and Spanish are both spoken on the island; English is used, but not as often.

Because of Rapa Nui's isolation and the southeasterly tradewinds and ocean currents it faces, there have been many theories as to how the native people discovered it. Some experts believed that the people migrated from South America. Their argument was that it would be impossible for these unskilled voyagers to travel against the winds and the ocean currents to reach the island. But after lengthy studies, most agree that these highly skilled people originated from Polynesia. They were so skilled in seamanship that they accomplished what their European counterparts could not.



According to oral traditions, the original Polynesian settlers, guided by their leader Hotu Matu`a, arrived at Rapa Nui (*Te Pito o te Henua*--the center of the world, or last point of contact with the world) in approximately A.D. 400. Some archaeologists believe that the island may have been settled much earlier due to carbon-dating of an *ahu* as early as the second century. Since these structures would not have been created until well after settlement, the actual settlement date could be much earlier than A.D. 400.

As the Polynesian settlers disembarked from their canoes, they found an island with adequate natural resources for their survival. From pollen samples taken from the island's wetlands, there is evidence that there was a lowland forest dominated by an extinct endemic palm species (*Jubaea chilensis*). The palm provided wood for building canoes that had to be large enough to withstand the rigors of deep-sea fishing. Native *hau hau* (*Triumfetta semitriloba*) trees were used to make cordage and the wood of the native *toromiro* (*Sophora toromiro*) tree may have been used for fueling fires and crafting huts. There were natural lakes and springs as well intermittent streams that provided the islanders with fresh water. There were no reefs, but the ocean was filled with shoreline and deep-sea fish.

Loss of Forests and Fisheries

As the human population increased, the forest and fisheries gradually declined. The forests, which once provided for the people, were not regenerating, and their ocean resources were on the verge of collapse. How did this island lose its natural resources? By most accounts, the environmental collapse on Rapa Nui is due to a number of factors that occurred gradually over a period of time.

By A.D. 1400, pollen samples from Rano Kau indicate that the forest in that part of the island was nearly gone. Pollen samples from another site, Rano Raraku, show an abundance of charcoal near the deposit's surface as well as evidence of soil erosion and changes in soil chemistry. Charcoal in the soil may have been due to burning of trees. Climatic change in the past may have affected soil chemistry. An alteration in rainfall, leading to less dense vegetation cover

could have caused more leaching of soil minerals during the wet season.

The introduction of the Polynesian rat may have contributed to deforestation. One study found rat teeth marks on *Jubaea* tree nuts, evidence that the nuts had been gnawed by rodents to extract the fruit. By eating the fruit of the nut, the rodent prevented germination of the seed. No seeds meant no seedlings and no new trees. Rats may have preyed on the island's birds as well. From the archaeological digs, there is evidence that all of the native land birds were gone from the island two centuries after the first arrival. If any of these birds were pollinators, their decline could have had an impact on the loss of plants as well.

Human overharvesting of timber for canoes, shelter, fuel, and fiber also contributed to the forest's degeneration. With the loss of the forest tree canopy, the soil was exposed to sun and rain. Rainfall caused extensive soil erosion and run-off, flooding streams and disabling onshore marine fisheries.

Without the forest, people were unable to build canoes sturdy enough for deep-sea fishing. They were then relegated to onshore fishing, depleting their ocean resources even further. One account describes the Dutch visit in 1722 to Rapa Nui. They were greeted by a Rapa Nui native in a canoe constructed of light timber and sewn and glued together with organic material. The canoe was so frail that the oarsman spent half of his time bailing.

The loss of forest and ocean resources had devastating consequences for the people. Food resources were scarce. Chickens were highly coveted and placed in specially designed stone dwellings to prevent thievery. By the 15th century, there is evidence of dramatic conflict with wars between tribes, competition for scarce resources, and finally, starving people resorting to cannibalism.

The loss of forest in Rapa Nui appears to have been gradual and due to many factors. By the time of Western contact in 1722, there were few trees remaining. And with the introduction of sheep after 1722, the island became even more barren.



The Moai

During the height of *moai* construction in the 14th and 15th centuries, island tribes directed their attention to the carving and erection of their *moai*. These towering stone statues which represented a tribe's ancestors, were believed to carry each tribes' *mana* (spiritual power or energy). Tribes moved their *moai* from the stone quarry to *ahu* (raised stone platforms) near the coast. There are 300 *ahu* around the island. Each *ahu* has house sites associated with it (up to 2,000 sites for each). The largest of these stone platforms is 1,800 feet long, 24 feet high and 40 - 60 feet wide. It took hundreds of people to build this huge *ahu*. An intriguing question is, how were the giant *moai* moved from the inland stone quarry to the *ahu* on the coast? According to oral traditions, the *moai* walked. Some archaeologists believe people moved the *moai* by edging them forward a corner at a time; others believe the statues were rolled on logs. There are over 800 *moai* on the island today.

Declining Human Population

The human population is estimated to have reached its peak of 8,000 - 20,000 people by 1680. But with the scarcity of resources, Rapa Nui's population began a downward spiral. According to many Rapa Nui legends, the production of statues ceased when quarrels erupted over food and there was a breakdown in the distribution and exchange of food. Craftsmen who relied on the farmers and fishers for food resources were unable to depend on them. The group cooperation that was a vital part of this society came to a halt.

Another significant event contributing to the near eradication of the native population was the Peruvian slave trade. In 1862, the human population on Rapa Nui may have totaled approximately 2,000 to 3,000. Approximately 1,000 people were captured and hauled off to Peru to slave in the guano mines. Over 900 Rapa Nui islanders perished from disease and ill treatment in these mines. Significantly, those captured included *ariki* (chiefs) and priests who were the keepers of oral traditions. Members of the *ariki* class knew how to read the inscriptions on the *ko hau rongō-*

rongō tablets. These tablets represent Polynesia's only indigenous, pre-European contact, written texts. This knowledge was destroyed by the Peruvian slave raids and their aftermath.

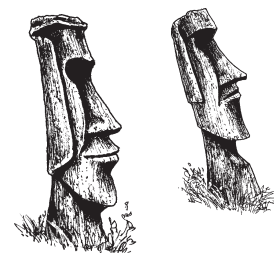
Several months later, the Bishop of Tahiti, Mgr. Tepano Jaussen, urged the Peruvian government to release the prisoners. Some of the islanders relocated to Mangareva and to Pamata'i in Tahiti; others returned to Rapa Nui. On their return voyage, 85 of the 100 islanders died from smallpox and tuberculosis. Fifteen people returned to Rapa Nui infecting the disease-free population. By the end of the epidemic, the island of Rapa Nui had been transformed into a mass grave. By the year 1877, only 111 people remained on the island. After the slave raids, some of the descendants of the islanders who relocated to Mangareva and Pamata'i returned safely to their island.

Restoration and Renewal

Based on Rapa Nui's devastating past, what efforts are currently underway by the people to restore their *moai*, regenerate their forests and reconnect to their Polynesian cousins?

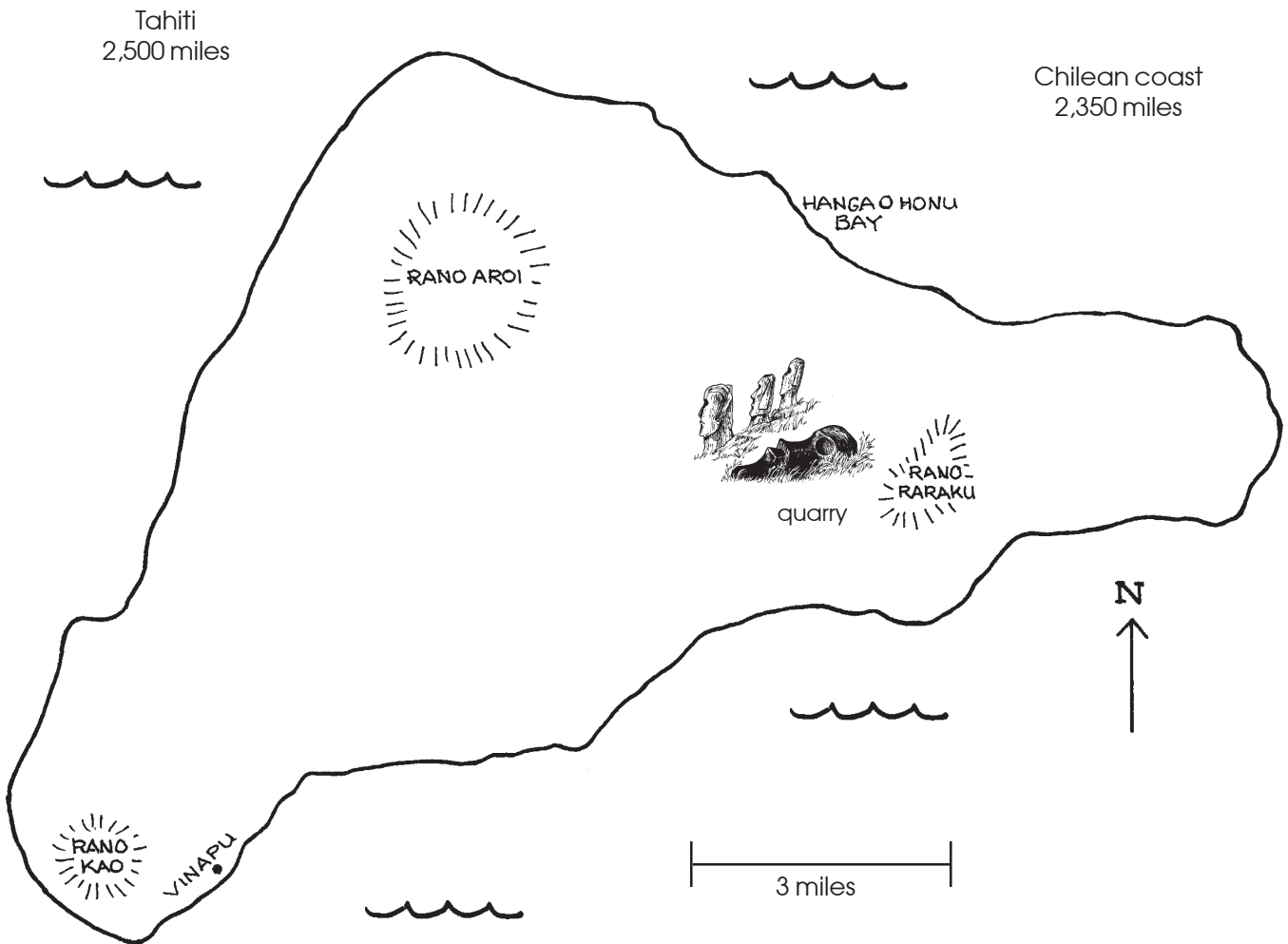
Both the government and the communities of Rapa Nui are working together to bring about cultural and environmental renewal. The interest shown in Rapa Nui monumental restoration has revived a sense of cultural pride among the native population. Most families have labored to restore the physical monuments of the island's past, beginning a process of reclaiming cultural identity that was badly damaged by Western disease and imperialism.

Rapa Nui leaders are reaching out to their Polynesian counterparts, particularly in Tahiti and Hawai'i, to help them with their efforts. In March of 1998, teachers, researchers and videographers from Hawai'i visited the island to prepare for the voyage to Rapa Nui in 1999. In May, an environmental group of high school students from





Rapa Nui





the Kamehameha Schools in Hawai'i were invited to take part in a scientific and cultural student exchange program. To prepare for the trip, the group's advisors worked closely with groups from Rapa Nui — professional archaeologists, government and community leaders, cultural resource specialists and the Rapa Nui Outrigger Canoe Club — to determine their needs. From that meeting, a list of objectives were compiled.

The trip was a success. The group gained an appreciation for and a better understanding of Rapa Nui and its people. They participated in several archaeological field studies learning about *moai* and petroglyph conservation. They compared the similarities of Rapa Nui's cultural practices in the use of native plants and animal materials to ancient Hawaiians. They shared their knowledge of stewardship and sustainability practices of ancient Hawaiians. They provided seeds of native Hawaiian plants and trees and planted them in the Rapa Nui National Park. The students also worked closely with the Polynesian Voyaging Society in helping to promote voyaging traditions and practices.

This experience helped to build and solidify the cultural and environmental relationship Hawai'i has with Rapa Nui. It also brought an awareness to the Hawai'i community of what could happen if we do not care for our own island resources. Ultimately, we can learn from Rapa Nui and work together in developing a brighter more sustainable future for our children.

Taking Action!

Kualapu'u School grades 5 and 6 students won Moanalua Gardens Foundation's 1998 Hawai'i Needs Care Award. Their project, "Promote Resolutions with Integrity for a Sustainable Moloka'i" (PRISM), demonstrates their commitment to caring for their island environment. Students conducted research on water and land use, habitat protection, resource management, energy, waste management and other issues concerning their island's future. Students visited sites, interviewed community members, and organized their data to present in a public symposium. Students have developed and implemented action plans based on the data they

collected. One community elder who attended the symposium commented that she could die happy knowing the future of her beloved island was in the hands of caring and committed kids!

Supplemental Resources

Bahn, Paul and Flenley, John. *Easter Island, Earth Island*. London: Thames and Hudson, 1992

Finney, Ben. *Voyage of Rediscovery*. University of California Press, 1994. (Recounts the voyage of rediscovery describing navigation, construction of voyaging canoes, the welcome in Aotearoa, and more.)

Flenley, J.R. and Sarah M. King. *Late Quaternary Pollen Records from Easter Island*. *Nature*. Vol. 307, January, 5, 1984

Moanalua Gardens Foundation. *Forest Treasures*. CD-ROM to be released in summer 1999. (This CD-ROM provides a database of Hawaiian forest plants and animals with animal sounds, videos, and a wealth of information about forests in Hawai'i and other parts of the world.)

Skottsberg, Carl, Ed. *The Natural History of Juan Fernandez and Easter Island, Vol. 1 Geography, Geology, Origin of Island Life*, UPPSALA, 1920. (See Part I Skottsberg's notes on a visit to Easter Island.)

Web Sites

Easter Island Foundation: <http://www.netaxs.com/~trance/eif.html> (Provides a list of references available for purchase from their foundation.)

Polynesian Voyaging Society: <http://leahi.kcc.hawaii.edu/org/pvs> (Provides articles and information about Rapa Nui and will have updates of the voyage to Rapa Nui in 1999.)

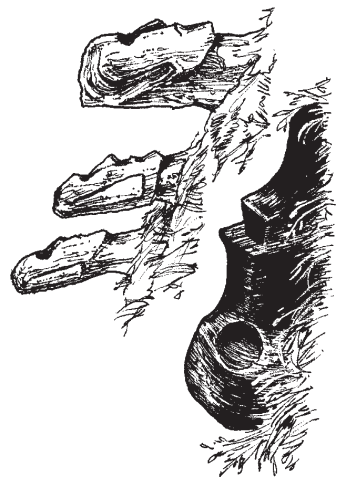
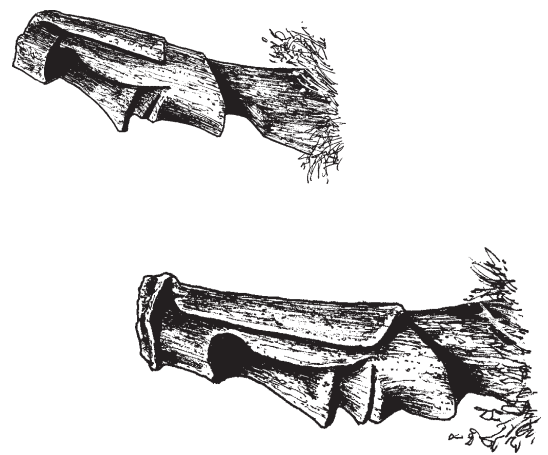
<http://hea-www.harvard.edu/~adam/easterisland/ww.html> (This site has a number of photographs of *moai* from different sites around the island.





Teaching Suggestions



- ✓ 1. Distribute copies of Aunty Momi's journal and ask students to take turns reading it aloud. Move the canoe cut-out along the voyaging line constructed in activity one, *The Remarkable Journey*, to Rapa Nui. Ask groups of students to write their answers to discussion questions and share their ideas with the class.
- ✓ 2. Distribute the student activity sheets and challenge students to solve the mystery of Rapa Nui. What caused the disappearance of forests, soils, and fish, and the drastic drop in human population on the isolated island of Rapa Nui?
- ✓ 3. Divide the class into six investigative teams. Students on each team should divide up tasks to research different sources of information and record relevant information to add to the team's report. Encourage students to use the Internet and library references for additional information.
4. Once they've solved the mystery, ask students on each team to present their findings. Their presentations should include diagrams that depict relationships between significant events and any photographs or drawings that students download from the Internet.
- ✓ 5. After each team presents its findings, encourage other students to ask questions and compare the results of different investigations. Discuss ways that human activities lead to unbalanced ecosystems.
- ✓ 6. Ask students to reflect in their journals on ways they bring the values of *lōkaahi* (balance), *kuleana* (responsibility), *hō'ihī* (respect) and *lokomaika'i* (good-hearted) into their lives.





The Mystery of Rapa Nui

Meeting Standards

Focus Question: What caused the decline of natural resources and human population in Rapa Nui and what can we learn from our shared ecological and cultural kinship?

Standard	Student Tasks	Assessment: Meet Criteria	Assessment: Exceed Criteria
<p>✓ 1 Demonstrate comprehension of text by writing about theme/author's message.</p> 	<p>In small groups, students discuss the following questions about Auntie Momi's journal:</p> <ul style="list-style-type: none"> • What were Auntie Momi's biggest concerns toward the end of the journey to Rapa Nui? Why? • Could the kind of environmental destruction that occurred on Rapa Nui ever happen to Hawaii? Why or why not? • How is living on an island similar to surviving on a canoe? • What can we do to live healthy and sustainable lives without jeopardizing our future? • What could our class do to really "make a difference" and work toward a healthy, balanced environment? 	<p>During class discussion:</p> <ul style="list-style-type: none"> • each group will list at least one answer to each question discussed; • each group will share the answers of two questions with the whole class. 	<p>Students take action for the environment by conducting a project that helps to conserve resources.</p> 

<p>✓ 3 Identify human activities that may create changes resulting in unbalanced ecosystems.</p> <p>Depict information and relationships by constructing diagrams, charts, and graphs.</p>	<p>Teams of students research information about the loss of resources and decline in human population in Rapa Nui.</p> 	<p>Each student on a team:</p> <ul style="list-style-type: none"> summarizes the clues from at least one source of information provided; gathers information from two other sources using the library and Internet; draws a diagram or other graphic to depict relationships between events and outcomes related to the mystery; identifies how the changes led to unbalanced forest and nearshore ecosystems. 	<p>Student gathers information from two additional sources and includes this information in the team's report.</p> <p>Student's report includes comparisons to his/her island where resources have declined due to human activities.</p>
<p>✓ 5 Produce a narrative account that creates an organizing structure and establishes the significance of events.</p>	<p>Teams of students present their findings to the whole class.</p>	<p>Each student on a team:</p> <ul style="list-style-type: none"> presents part of the team's findings; describes how the clues led to conclusions; helps to answer questions from other teams. 	
<p>✓ 6 Apply themes to own life experiences.</p>	<p>Students reflect on the values learned in this unit.</p>	<p>Journal will have:</p> <ul style="list-style-type: none"> daily entry for one week one entry for each value (<i>tōkahi</i>) and (<i>kuleana</i>) reflecting how the value is applied in student's life. 	<p>Journal will have daily entry for two weeks.</p>

Teacher's Answer Sheet (1 of 2)



Field Work Clues

Archaeological Digs

Why weren't the same kind of bones found in each of the layers?

- The bones are clues to the food people ate at different periods, so there must have been different foods available at different times.

What do the different layers of bones indicate?

- The chicken bones are clues to the most recent diet of people on the island. The middle layer of rat bones and sea snails indicate people were probably relying on these animals for food. The lowest layer indicates that dolphin, seal and sea birds were used for food. (However, dolphins are an *aumetua* (family god) for some islanders and were probably not consumed by them.) The fact that these bones are not in the upper layers, indicates that these animals were no longer a source of food.

Dolphins are plentiful around the island and may have been a source of food for the islanders. What could have caused the people to stop harvesting dolphins? (You may need to find more information about the forest. See the pollen analysis and Ship's Logs.)

- The loss of trees meant that the islanders would not have been able to build the sturdy canoes they would need to fish for dolphin.

Why did the people change from using obsidian materials for tools, to using it for weapons? What does this tell us?

- The shift from tools to weapons around A.D.1400 indicates that wars broke out and were probably at a peak around 1800s.

Pollen Samples

What were the results of the pollen analysis? What does this suggest happened to the forest in this part of the island? Why?

- By A.D.1400 there are no pollen grains for *hau hau* (*Triumffetta semitriloba*) trees, and the native palm (*Jubaea chilensis*) and toromiro (*Sophora toromiro*) trees are declining at Rano Kau, although pollen grains for these trees were abundant in A.D.750. This suggests the forest was nearly gone in this part of the island by A.D.1400.

Why were forests growing prior to A.D.750, but nearly gone after A.D.1400 at Rano Kau? What happened?

- *Hau hau* was used as cordage and it could have been harvested to make cordage to haul and erect the *moai*. The disappearance of *hau hau* from Rano Kau at the same time that there is a move to making weapons, suggests that people were fighting over scarce resources. Palms were used for canoes. The decline in the palm pollen and the lack of dolphin bones in later layers of the archaeological dig indicates that the people lacked the trees they needed to make sea-worthy canoes.



Teacher's Answer Sheet (2 of 2)



Oral Traditions Clues

How would you describe the physical appearance of the *moai kavakava*? Do you think this provides any clue to what was happening to the people of Rapa Nui? Why?

- The hollow cheeks and protruding ribs indicate starvation.

What do you think happened to the toppled over *moai* and to the white coral eyes of the *moai*? Why did it happen? What do you think was so significant about the eyes?

- People must have toppled the *moai* and removed the white coral eyes. The fact that *moai* are toppled over and many are broken at the neck indicates warfare and that people may have been fighting over scarce resources. Taking the eyes from another's *moai*, could be viewed as trying to take away some of the statue's *mana* (power).

What does the legend about the old woman tell you about the people during this period?

- It indicates that people didn't have enough to eat so they were unable to exchange food for labor and continue carving the giant *moai*.

How did the people move the huge stone statues from the stone quarry to the coast? Could the transportation of the *moai* have anything to do with the depletion of their forest?

- It is unclear how the statues were moved. The cordage from forest trees (*hauhau*) could have been used to haul and erect the *moai* and this would have had a direct effect on the loss of the forest.

Ships' Logs Clues

Why were the islanders who greeted Dutch Admiral Jacob Roggeveen in 1722 having to bail out their canoes?

- The canoes were made of planks sewn and glued together and they leaked. The trees were gone so the islanders had no sturdy canoes.

Could the leaky canoes be related to the fact that there were no dolphin bones in the middle and upper layers of the archaeological dig?

- To catch dolphins, the islanders would have needed sturdy canoes. When the trees were gone, the islanders would not have been able to build sturdy enough canoes to catch dolphins.

What do most of the ships' logs and Stefan's letter tell us about finding foods or other resources on Rapa Nui?

- Food, water, lumber, marine animals, and all resources were too scarce to provide anything to visiting ships in the 1700s and 1800s.

What does Cook's description of the islanders tell you was happening to the population?

- The people were starving and there were either few females or the females were hidden.

Student Activity Sheet



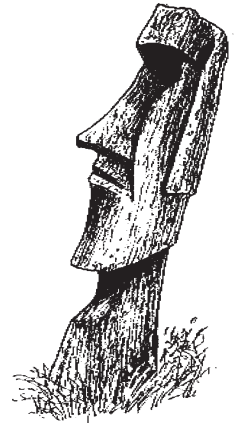
The Island: Locate Rapa Nui (Easter Island) on a map or globe.

Rapa Nui, like Hawai'i, is very isolated; it is considered to be the most isolated high island ecosystem in the world. It is a tiny island, about the size of Lāna'i, located approximately 2,400 miles off the Chilean coast.

- What is the nearest island to the northwest of Rapa Nui, 1,400 miles away?

Polynesian Settlers

Guided by their leader Hotu Matu`a, the original Polynesian settlers arrived at *Te Pito o te Henua* (Rapa Nui) in approximately A.D. 400. They discovered an island with the natural resources they needed to survive. The island had forest resources for them to build their canoes, fuel their fires, and craft their huts. There were natural lakes that provided them with fresh water. There were no reefs, but the ocean provided shoreline and deep-sea fish. The human population grew to approximately 8,000 - 20,000 people by 1680. However, by 1877, only 111 people remained on the island! Today, the island is known for the *moai* that the people carved, mostly during the 14th and 15th centuries. These stone statues play an important role in the island's history.



What Happened on Rapa Nui?

You learn that these majestic *moai* were at one time all toppled over. Some have been restored to an upright position. Most of the forest and much of the topsoil on the island is gone. All of the native land birds and sea birds are gone, and the nearshore fisheries are nearly depleted, too. People are working to restore the island to its former health. You are helping in this effort by documenting why the resources were lost and why the human population crashed. Your report will be shared with other students to prevent such losses from occurring again.

Mystery

What caused the disappearance of forests, soils and fish, and the drastic drop in human population on the isolated island of Rapa Nui?

Your Task

You have just been assigned to an investigative research team on the island of Rapa Nui. You are to investigate the mystery of Rapa Nui and write a report with your conclusions. Your team's report should summarize each of the clues you find through:

- FIELD WORK - find the clues in the archaeological dig sites and in the pollen analysis.
- ORAL TRADITIONS - discover the connection between the huge *moai* and the island's resources.
- SHIPS' LOGS - find the secrets in the archives of old ships' logs.

A good investigator leaves no stone unturned, so dig up as much evidence as possible! Explore other sources of information from books, articles and the Internet.

Field Work (1 of 2)



Archaeological Digs: Bones

On the first day, you arrive at an ancient house site where excavations are already in progress. You and your team carefully set to work uncovering the earth and creating a “test pit.” As you dig through three layers of sediment representing different “time periods,” you discover that embedded in each of the three layers of clay are bones. In the first layer, nearest to the surface, you discover several kinds of chicken bones. The second layer reveals remnants of rat bones and shells from sea snails. The last layer, and the deepest, reveals the remains of dolphin, seal and sea bird skeletons. You jot down your findings.

Clue: Why weren't the same kind of bones found in each of the layers? What do the different layers of bones indicate?

Clue: Dolphins are plentiful around the island and they may have been a source of food for the islanders.* What could have caused the people to stop harvesting dolphins? You may need to find more information about the forest. See the Pollen Samples and Ships' Logs



Weapons

The next day you spend at the town of Vinapu. Another field survey is being done, except this time archaeologists are searching for prehistoric weapons called *mata'a*. You meet with the head of the excavation team and he shares his findings. The weapons that were discovered were made from a shiny, hard black rock called “obsidian.” The people of Rapa Nui used to use this rock to make tools around A.D. 1400, but by the 1800s the islanders were using obsidian for weapons instead. The production of *mata'a* was at its peak in the 1800s. Renowned archaeologist, William Mulloy, discovered 402 obsidian stones hidden in a cave in Vinapu. It's an interesting find. You make several notes and return home.

Clue: Why did the people change from using obsidian material for tools, to using it for weapons? What does this tell us?

*According to some sources, the dolphin was the *aumetua* (family god) for some islanders and would not have been a food source for those who had this relationship with the dolphin.

Field Work (2 of 2)



Pollen Samples

The next day, you meet a friend who has been commissioned to do a pollen analysis of several samples taken from the Rano Kau crater. This crater is actually a caldera where there is a swamp with a floating mat of vegetation. You must be careful here; the swamp is dangerous. If you fell through, it would probably be fatal. You are told that one geologist already disappeared here without a trace!

You stay on the edge of the swamp where the pollen sample was taken. The sample is a long core of soil dug out of the swamp. Looking at the deepest part of the core sample is like looking back in time. The acidic soil in the swamp has preserved tiny grains of pollen dating back thousands of years. The amount of pollen at different depths in the core sample reveals what kinds of plants were present at different times.

Your friend's results are remarkable. Her findings indicate that prior to A.D. 750, there were many *hau hau*, palm and toromiro trees. The islanders used *hau hau* trees to make rope, palm trees for canoes, and toromiro trees for firewood. But as you move up the sample to approximately A.D. 950, there are fewer tree pollen grains present. This indicates that trees are disappearing. By A.D. 1400, there are no *hau hau* pollen grains in the sample. There are some pollen grains for toromiro and palm, but they are declining. What a startling find! You make a few notes and thank her for inviting you.

Clues

- What were the results of the pollen analysis? What does this information suggest happened to the forest in this part of the island? Why?
- Why were forests growing prior to A.D.750, but nearly gone after A.D.1400 in Rano Kau? What might have happened?



Oral Traditions



Many, many years ago, the people of Rapa Nui transported huge stone statues or *moai* from one part of the island to another. You believe that there is some connection to the transportation of the *moai* and the island's resources. It is up to you to determine how the *moai* were moved and how this related to the depletion of the island's natural resources.

On first inspection of your island, you observe a "sea" of *moai*. There are about 800 of these huge stone statues. The largest *moai* is 300 tons and 66 feet high and lies unfinished in the quarry. The largest on an *ahu* (raised stone platform) is 40 feet high. Most are near the coast staring inland, while others lay abandoned on dirt roads. Some *moai* are partially carved in the stone quarry that provided the volcanic rock from which they were carved. What heightens your curiosity is the fact that at one time the *moai* were toppled over and many were broken at the neck. You make a few notes.

The next day, you ask permission to meet with island elders. They explain to you that many of them do not recall why or how the *moai* moved from the quarry to the *ahus* around the coast. Some say the *moai* walked. You are skeptical of that explanation since a good number of the *moai* were found nearly 12 miles away from the quarry! The elders explain that the *moai* were a very significant part of Rapa Nui culture. The *moai* represent the ancestors and are believed to possess *mana* (spiritual power). The larger the *moai*, the greater the *mana* the clan would possess. Because of this, tribes engaged in battle, fighting over who possessed the larger and more powerful *moai*. The elders also mention that white pieces of coral were used to represent the eyes of the *moai*. But on your initial inspection of the toppled stone statues, there was no evidence of this. The elders also show you some wood carvings called *moai kavakava*. These carvings show men with beards, hooked noses, hollow cheeks and protruding ribs. You make a few notes and graciously thank your hosts for their information.

The following day, you speak to an island elder about your research. She tells you that as a child, she learned a legend about a woman (believed to be a witch) who was denied her rightful share of lobster. In anger, the old woman caused those laboring in the quarry to stop all production of *moai*. The legend intrigues you. You know that the island people exchanged food for labor. The fisher gave to the farmer, and the farmer provided for the craftspeople. Everyone shared resources. You write a few remarks on your notepad.

Clues

- How would you describe the physical appearance of the *moai kavakava*? Do you think this provides any clue to what was happening to the people of Rapa Nui? Why?
- What do you think happened to the toppled over *moai* and to the white coral eyes of the *moai*? Why did it happen? What do you think was so significant about the eyes?
- What does the legend about the old woman tell you about the people during this period?
- How could the people have moved the huge stone statues from the stone quarry to the coast? Could the transportation of the *moai* have anything to do with the depletion of their forest? How?

Ships' Logs (1 of 3)



After combing through the archives on Rapa Nui, you find the following notes from ships' logs and an old letter from a crew person aboard the first foreign ship to visit the island in 1722. Some of them are useful clues; some are not.

- *"The ship was soon invaded by a group of natives who were so bold that they took the hats and caps of the sailors from their heads and jumped with their plunder overboard."*
- *Their craft were "put together with manifold small planks and light inner timbers, which they cleverly stitched together with very fine twisted threads....But as they lack the knowledge and particularly the materials for caulking and making tight the great number of seams of the canoes, these are accordingly very leaky, for which reason they are compelled to spend half the time in bailing."*
- *"The stone images at first caused us to be struck with astonishment because we could not comprehend how it was possible that these people, who are devoid of heavy thick timber for making any machines, as well as strong ropes, nevertheless had been able to erect such images."*

Dutch Admiral Jacob Roggeveen, 1722

(see crew's letter also, pages 68-73)

- *Natives were "small, lean, timid and miserable."*
- *"No nation need contend for the honour of the discovery of this island; as there can be few places which afford less convenience for shipping than it does. Here is no safe anchorage; no wood for fuel; nor any fresh water worth taking on board. Nature has been exceedingly sparing of her favours to this spot."*
- *"As everything must be raised by dint of labour, it cannot be supposed the inhabitants plant much more than is sufficient for themselves; and as they are but few in number, they cannot have much to spare to supply the wants of visitant strangers."*
- *"The workmanship of the ahu (religious platform) "is not inferior to the best plain piece of masonry we have in England. They use no sort of cement; yet the joints are exceedingly close, and the stones morticed and tenanted one into another, in a very artful manner."*
- *"The inhabitants of this island do not seem to exceed six or seven hundred souls, and about two-thirds of those we saw were males. They either have but few females among them, or else many were restrained from making their appearance, during our stay."*

Capt. James Cook, 1774

Ships' Logs (2 of 3)



- "I don't know how I am to make a fire on that island, there is no wood!"*
Bailey, Katherine Routledge's ship's cook
(no date)
- We saw "a platform on which were set four red statues, equidistant from one another, their summits covered with white stones."*
French Admiral Abel Dupetit-Thouars, 1838
- "Much has been said in ancient times of the convicts in the quarries. They were tortured less than the laborers in the guano quarries. The dust and the smell could suffocate a novice. It is impossible for anyone not used to them to spend an hour at the workings."*
M.L. Simonin, Le Tour du Monde, 1868

NOTE: During the Peruvian slave trade, islanders were taken against their will to serve as slaves in mines for guano (bird droppings). Guano is a source of fertilizer, rich in nitrogen. Conduct some research to find out how this slave trade devastated the people of Rapa Nui.

- The natives "stop me before one of these thatched dwellings that are to be found everywhere, flattened amidst the rocks and sand, resembling the back of a beast lying down. And they invite me to enter, which I am forced to do on all fours, threading my way in like a cat through a cat flap, because the door, at ground level, and guarded by two sinister-faced divinities of granite, is a round hole, barely two feet high."*
- "The bottom of the funnel (at Rano Kao) is occupied by a lake lined by rushes that serves as a watering place for livestock. Green slopes close off the horizon, making this pocket a world apart, enshrined in the island."*
Pierre Loti, L'île de Paques, 1872
- "We can catch no glimpse of relations between individuals save the exterior forms and tokens of politeness...When a chief paid a visit to the chief of another tribe he was met along the road by groups of warriors, who formed an escort. On these occasions no doubt the chanters recited long genealogies, as is still done on the Tuamotus. The two chiefs advanced to meet and pressed the wings of their noses together."*
Alfred Metraux, Easter Island, 1957

Ships Logs (3 of 3)



- *"The men who could execute such perfect work must have possessed ultra-modern tools....A small group of intelligent beings was stranded on Easter island owing to a 'technical hitch.' The stranded group had a great store of knowledge, very advanced weapons and a method of working stone unknown to us...Perhaps to leave the natives a lasting memory of their stay, but perhaps also as a sign to the friends who were looking for them, the strangers extracted a colossal statue from the volcanic stone. Then they made more stone giants which they set up on stone pedestals along the coast so that they were visible from afar...In the remote past there were intelligences with an advanced technology for whom the covering of vast distances in aircraft of the most varied kinds was no problem."*

Erich Von Daniken, Return to the Stars
1972

Clues

- Why were the islanders who greeted Dutch Admiral Jacob Roggeveen in 1722 having to bail out their canoes?
- What do most of the ships' logs tell us about finding foods or other resources on Rapa Nui?
- What does Cook's description of the islanders tell you was happening to the population?

05 April 1722

Dearest Mummy,

I am writing to assure you of my safety and good health. I know that it was poor of me to up and leave our lovely home in Amsterdam without a moments notice, but I must hasten to profess that I longed for freedom, excitement and adventure. Admiral Jacob Roggeveen has been most gracious and has allowed me to serve as a pantry boy aboard his vessel.

We have visited several Pacific Islands on our journey, but none other stands foremost in my mind but Easter Island appropriately named by the admiral himself. It was on that Easter Sunday that we set anchor in Hanga o Honu Bay.

A group of natives greeted us in canoes made from many planks of wood. These canoes were put together with small planks and light inner timbers, which they cleverly stitched together with very fine twisted threads. Their canoes were leaky so they were compelled to spend half their time bailing.

The admiral ordered a small shore party with peaceful

intentions to light ashore and seek food supplies. The natives were most cordial and accommodated us most willingly. Yet, as we roamed the island in search of foodstuffs we were alarmed by what we perceived as a people near starvation.

All that remained in the timberland were stumps of dry, rotting wood. A fair amount of natives were transporting a felled tree by means of fine woven thread. It was most awkward for them as the thread would part as they would tug on the line. The small bushes scattered about carried the pungent scent of rodent, which we saw scampering from twig to twig devouring plant seeds.

It was evident that what little rain the heavens produced ran off the hard ground into the sea. There was no shelter from the treetops to shield the sun and wind, hence the rain ran off the parched land.

As we ventured from the timberland, we came upon a series of logs that stretched to the horizon. We maneuvered through the maze of timber and came upon a volcanic mountain, which the natives referred to as Rano Raraku. Rano is their name for

mountain. To our amazement, we discovered a tribe of natives chiseling enormous monuments from the volcanic tuft with primitive adzes. Some of these men lay chiseling in crevices no larger than a coffin. Another large group of men attempted to hoist one of the stone structures skyward. We watched in awe at this most incredible feat.

As we descended from the mountain, we noticed with surprise a sea of giant sculptures. Hundreds of statues lay scattered at the foot of the volcano. Some lay abandoned and others remained imprisoned in the volcano's quarries.

As we neared a monumental structure, we noticed the incredible workmanship of the statues. It was the best plain piece of masonry we had ever seen. No sort of cement was used. Most of the eye sockets were empty, but a few carried white coral representing each eye. We learned that it was believed the eyes and the head of the statue carried some form of mana (power). A community of natives, it appeared, had gathered for some sort of ceremony.

On our search for food, we came upon a stone construction in what appeared to be a chicken dwelling. It was circular in

shape and made of small stones piled high and carefully fitted. Inside the structure were a series of chambers which served as resting houses for the chickens. It was common to see the chicken dwellings scattered about the island. The dwellings prevented thievery and those owning the feathered birds were perceived as wealthy. Since the master of the chicken dwelling was no where in sight, we warmed our hands on a nearby cooking fire and quickly departed circling back around the island still in search of food.

As we made our return to our ship, we noticed few thatched huts. It appeared that most of the natives resided in cave dwellings. In fact, they had built an elaborate garden system in which they grew sweet potatoes, yams, arrowroot, taro and palm lilies. Alas, the garden we came upon had been depleted and lay dry and fallow. The men and I moved on in further search of food.

When we reached the cove of Hanga o Honu, we noticed an abandoned log partially hollowed. It seemed as if the natives had attempted to create a seaworthy canoe, but never finished the task. Upon reflection, it appeared to be the only

log on the island from which a seaworthy canoe could be crafted. I remember the natives whom greeted our ship in leaky canoes.

Wading out into the sea, we witnessed several women near shore attempting to harpoon something between the rocks. But upon closer investigation, it appeared that all they had captured were a crab and two sea urchins. We made our own search of shellfish and found none. It was as desolate a place that I had seen in a year's journey with the admiral.

We returned to our ship to report to the admiral about the meager provisions on the island. But the starkness of the land and the haunting beauty of the stone statues remained forever etched in my mind. Although we were unable to find nourishment for ourselves, it was with great regret that I departed this mysterious island. How were the people to survive with so little foodstuffs? Of what value were the great stone statues? How were they transported and erected? What had befallen the timberland? Why had the sea been depleted of its shellfish? These questions continued to haunt me even after we had been at sea for several weeks.

I yearn, dearest mummy, to one day return to this most

intriguing place. But for now I will continue on Admiral Roggeveen's course in search of other uncharted lands.

Please pray for my safe return. I will forever hold you in my nightly prayers. Godspeed.

Your loving son,

Stefan

Note: This letter is fictional, but the information it contains is based on fact.