

## Channel Islands Culture: Past and Present



**Julie Tumamait-Stenslie**  
Tribal Elder and Educator  
Chumash (Ventureño/Cruzeño)  
Storyteller

### Research Focus

*What do oral narratives and archeological records tell us about how Chumash people lived? How does understanding Chumash culture enrich our lives?*



**John R. Johnson**  
Curator of Anthropology  
Santa Barbara Museum of Natural  
History

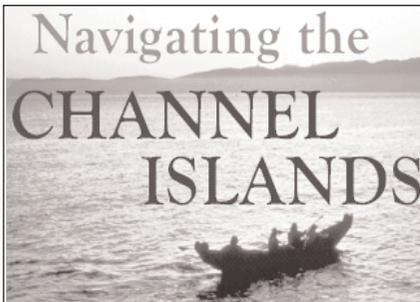
### Research Focus

*When did the earliest Paleo-Indians arrive in the Channel Islands and what can we know about them?*

### Team JASON Online



- **Digital Lab:** Navigating the Channel Islands
- Channel Islands Culture Story Page with online only recordings of traditional language and activities.
- Chat Sessions
- Message Boards



### Video



- Tides of Change: Kelp Forests
- Surf, Sand, and Survival: Northern Elephant Seals



### Live Broadcast



Use JASON XIV components to prepare for the live broadcast. Visit Team JASON Online for the latest details.



Story 2 involves the **human history and culture** of the Channel Islands. With host researcher John Johnson, an anthropologist, you will explore some of the oldest evidence of human life on the Channel Islands, and be introduced to the history of the Chumash people. Host researcher Julie Tumamait-Stenslie will introduce you to the continuing traditions of the Chumash. You will learn about a kind of traditional Chumash canoe called the tomol and the role it played in the early trade networks of southern California.

## Channel Islands Culture: Past and Present

### Research Article

**Channel Islands Culture: Past and Present** .....page 49

Exercise 2.1 History/Culture, Economics  
1½ hours (two 45-minute periods) *Applying Knowledge, Negotiating*

**Trading for Life** .....page 53

Students will gain an appreciation of the tomol and shell bead money as powerful instruments of culture, settlement, and trade by role-playing members of Native American groups engaged in early commerce.

Exercise 2.2 Math, History/Culture  
1 day, plus 1½ to 3 hours (two to four 45-minute periods) *Gathering Data, Drawing Conclusions*

**Dig It!** .....page 58

In this two-part exercise, students will analyze a Chumash midden and compare it to their own culture’s discards, then prepare a box of “archaeological artifacts” for discovery and analysis by the class.

Exercise 2.3 Geography, History/Culture,  
45 minutes *Reading and Interpreting Maps*

**Trapped by the Channel** .....page 62

Students will test basic navigational skills by pinpointing the locations of submerged shipwrecks and learn what shipwreck remains reveal about the Channel Islands’ maritime history.

### Student Self-Assessment

45 minutes *Drawing Conclusions, Applying Knowledge*

**What’s the Evidence?** .....page 65

Students will use archaeological and anthropological evidence to place an assortment of historical objects in sequence on a timeline.



“When people look at plants and animals—they should think that these things were once medicines and tools and toys. Nothing was ever wasted, almost all the parts of an animal were used. And when it came time to gather plants, some of each plant was left to grow, so it would be there for the next season.

—Julie Tumamait-Stenslie,  
JASON host researcher



“The Chumash had an active exchange system, an economic network, involving 150 towns and villages, that brought different groups together. The presence of bead money is one way to trace the extent of Island Chumash influence.”

—John R. Johnson,  
JASON host researcher



## STANDARDS AND ASSESSMENT

Student Name: \_\_\_\_\_

National Education Standards		Exercise		
<p><b>Science Standard E: Science and Technology</b> Students should develop abilities of technological design and understandings about science and technology.</p>	Trapped by the Channel Navigating the Channel Islands			
<p><b>Science Standard F: Science in Personal and Social Perspectives</b> Students should develop an understanding of populations, resources, and environments.</p>	Trading for Life Dig It! Trapped by the Channel			
<p><b>Math Standard: Representation</b> Students should learn how to create and use representations to organize, record, and communicate mathematical ideas as well as to solve problems.</p>	Trapped by the Channel Navigating the Channel Islands			
<p><b>Geography Standard 6: Places and Regions</b> Students should understand how culture and experience influence people's perceptions of places and regions.</p>	Trading for Life Dig It! Trapped by the Channel Navigating the Channel Islands			
<p><b>Geography Standards 9–11: Human Systems</b> Students should understand that people are central to geography in that human activities help shape Earth's surface, human settlements and structures are part of Earth's surface, and humans compete for control of Earth's surface.</p>	Trading for Life Dig It!			
<p><b>Geography Standard 17: The Uses of Geography</b> Students should understand how to apply geography to interpret the past.</p>	Dig It! Trapped by the Channel			
<p><b>English Language Arts Standard 9</b> Students understand and respect diversity in language use, patterns, and dialects across cultures, ethnic groups, geographic regions, and social roles.</p>	Trading for Life			
<p><b>Performance Indicators: Trading for Life</b></p>	<b>Novice</b>	<b>Apprentice</b>	<b>Researcher</b>	
Simulates a trading system involving resources and currency and tracks the distribution of goods.				
Devises and carries out an economic plan.				
<p><b>Performance Indicators: Dig It!</b></p>	<b>Novice</b>	<b>Apprentice</b>	<b>Researcher</b>	
Analyzes and compares anthropological data.				
Presents data in a graphical format.				
<p><b>Performance Indicators: Trapped by the Channel</b></p>	<b>Novice</b>	<b>Apprentice</b>	<b>Researcher</b>	
Uses latitude and longitude to pinpoint location.				
Constructs a timeline using archaeological information.				
<p><b>Student Self-Assessment: What's the Evidence?</b> <b>Skills: Drawing Conclusions, Applying Knowledge</b></p>				
				<b>Score</b>
<p><b>Multiple Choice Test—Team JASON Online at <a href="http://www.jasonproject.org">www.jasonproject.org</a></b></p>				



Teacher Notes: \_\_\_\_\_

Teacher preparation

# Channel Islands Culture: Past and Present

## Focus questions

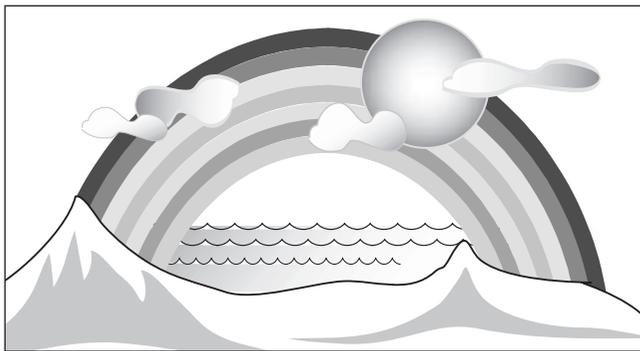
What tools and technologies have people in this region developed to adapt to the maritime environment?

How have people from different time periods used the marine and coastal resources of this region?

What methods do scientists employ to examine the Channel Islands' past?

## Who were the first people in the Channel Islands?

The first Chumash people were created on Santa Cruz Island. They were made from the seeds of a magic plant by the Earth Goddess, whose name was *Hutash* . . . So begins an **oral narrative** describing the origin of the first people to inhabit the Channel Islands. According to the story, the Chumash crossed from Santa Cruz to other islands and the mainland on a bridge made by *Hutash* from a giant rainbow. As they crossed, some Chumash fell from the rainbow into the sea and were turned into dolphins. The Rainbow Bridge story symbolizes the close connection of the Chumash to the earth and the sea, and the expansion of their culture to the other Channel Islands and the mainland.



The Rainbow Bridge spanning the Channel.

**Anthropologists** and **archaeologists** have different ideas about when humans first migrated to North America. Some believe people arrived over 18,000 years ago, while others say there is no evidence that

people have been here more than 13,000 years. Either way, they came across a land bridge (now gone) that connected North America and Asia. There are also two theories about how humans dispersed through North America once they got there. One theory is that people migrated along the continent's western shoreline using boats. According to the second theory, people traveled overland, through an opening between glacial ice sheets in western Canada.

The first people in south central California spoke three distinct but related languages: *Cruzeño* Chumash, Northern Chumash (also called *Obispeño*), and Central Chumash (which included the dialects *Purisimeño*, *Cuyama*, *Ineseño*, *Barbareño*, *Emigdiano*, and *Ventureño*). *Cruzeño* was spoken throughout the northern Channel Islands of Santa Cruz, Santa Rosa, San Miguel, and Anacapa. People of another, unrelated language group—the *Tongva*, or *Gabrielino*—inhabited the southern Channel Islands. The lone woman of San Nicolas Island, the subject of the novel *Island of the Blue Dolphins*, was a member of this group. (See the map on **Master A**.)

## How have we learned about Chumash culture?

The oral narratives of Chumash elders and rich archaeological finds throughout the Channel Islands are the sources of much of our knowledge about the Chumash. JASON host researcher John Johnson is an anthropologist and Curator of Anthropology at the Santa Barbara Museum of Natural History. As part of his work, Dr. Johnson goes to ancient village sites where he studies ancient Chumash trash heaps called **middens**. The middens are dark, composted piles of earth, charcoal, and shell fragments. They contain fishing hooks, shell beads, and other **artifacts** that reveal much about Chumash life, from thousands of years ago up to the mid-1800s. Dr. Johnson and other anthropologists have also learned about the Chumash by studying written records of the last native people to live in their original communities.

Host researcher Julie Tumamait-Stenslie is a direct descendant of the *Cruzeño*, or Island Chumash. She monitors artifacts on the islands and works closely with Dr. Johnson and other anthropologists.

Ms. Tumamait-Stenslie traces her ancestors back for eight **generations**. Her great-grandfather's family came from the villages of Swaxil, Lu'upsh, and Nanawani, on the eastern end of Limuw, as they called Santa Cruz Island (see Map 4 in the Atlas). The name Tumamait is said to mean "an orphan." Ms. Tumamait-Stenslie is a storyteller and educator who reveals the values and history of her ancestors through their oral narratives.

The oldest human remains found in North America are those of the "Arlington Springs Woman," discovered at Arlington Canyon on Santa Rosa Island. These bones have been estimated by radiocarbon dating to be nearly 13,000 years old. Daisy Cave on San Miguel Island also contains early artifacts, including a child's sandal. People probably could not have reached the islands without boats or rafts. Their presence there so long ago supports the theory that North America's first settlers migrated along the Pacific coast by sea.

### What have we learned about Chumash culture?

Scientists divide Chumash history into Early, Middle, and Late Periods. In the Early Period, island natives were primarily hunters and gatherers. They ate mostly coastal shellfish and the seeds and berries of island plants. During the Middle Period they invented the **tomol** (a wooden plank canoe) and began to use bead money made from shells. This shell money and the means to travel farther over the local waters to fish and trade transformed their culture.

#### Chumash Periods

**Early** 8,500 to 3,200 years ago

**Middle** 3,200 to 800 years ago

**Late** 800 to 180 years ago  
(when all Chumash had resettled at missions)

The islanders made shell bead money from olivella, abalone, and mussel shells. They quarried a hard mineral called chert on Santa Cruz and San Miguel, which they used to drill holes in the shell fragments so they could be strung. The people on the mainland called the people on Santa Cruz Island *Mi tcu' mae*, or "makers of shell bead money." Eventually, the word "Chumash" came to refer to all the people of the region.

The Island Chumash began to fish farther offshore and to hunt marine mammals. They also traded with other islands and the mainland, where they acquired deer meat and mainland plants. Shell bead money became widely dispersed. By the Late Period, the Chumash had a sophisticated and thriving economy. Archaeologists see changes from the Early Period to the Middle Period and into the Late Period reflected in the

middens. In the lower layers, representing the Early Period, abalone shells and other shellfish make up the largest percentage. The surface layers, which correspond to the Late Period, contain large quantities of fish and marine mammal bones as well as bead fragments.

The Chumash lived in thatched domed houses, called *aps*. *Aps* were made from sycamore, cottonwood, or willow poles lashed together at the top and covered with tule or cattail thatch. The Chumash were also well known for their basketry, and for the red, black, and white rock paintings found in some caves on the islands. These paintings depict important historic and ritual events. The Chumash made them using pigments prepared from iron ores, charcoal, and other minerals.



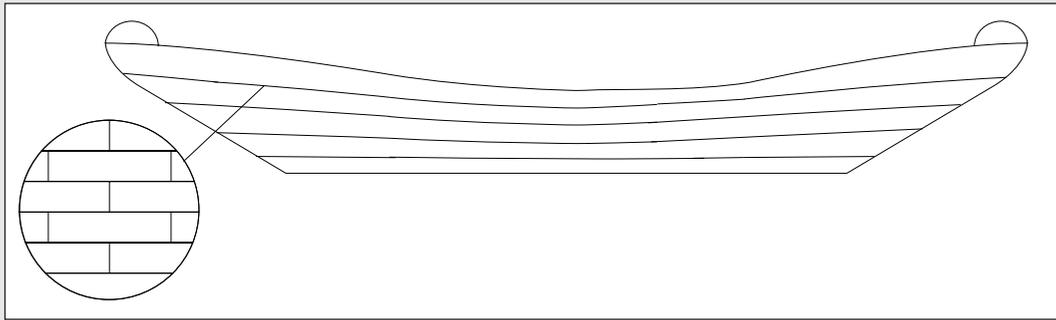
Chumash bead money made from olivella shells.



A handful of artifacts recovered from a Chumash midden.

## Building a Tomol

A tomol's frame was constructed of redwood logs that had washed ashore. Skilled craftsmen, known as The Brotherhood of the Tomol, made the canoes by splitting the logs into planks, sanding them, and lashing them together using dogbane or nettle cords. The seams were caulked with *yop*, a substance made from tar (from the region's natural oil seeps) and pine pitch. The redwood planks swelled when wet, making a watertight seal.



Tomol construction.

## What happened to the Chumash culture?

The Spanish explorer Juan Rodriguez Cabrillo was the first European to write about the Channel Islands, on his 1543 voyage. Another Spanish explorer, Sebastian Vizcaino, developed the first good charts of the islands in 1602. The Chumash, however, did not have significant contact with Europeans for about another 150 years. At the time of their first contact with Europeans, about 15,000 Chumash lived on the islands and adjacent mainland. Yet, by the time of the first state census in California (1852), fewer than 600 Chumash people remained. How did this happen?

Like many Native American cultures, Chumash culture nearly disappeared with the arrival of Europeans. The Spanish took Chumash people from their villages to build Spanish missions on the mainland. They taught the Chumash how to grow and harvest food and tend livestock, made them speak the Spanish language, and converted them to Christianity. As more Chumash became associated with **missions**, the Chumash lost their traditional way of life. The last of the Island Chumash were relocated to mainland missions in 1822. In addition, diseases such as smallpox and measles, unwittingly transmitted by settlers, soldiers, and fur traders, killed thousands of Chumash people. By the end of the Mission Period, few people who identified themselves as Chumash were left.

In the 1800s, ranchers, Russian and Aleut sealers and

whalers, and Chinese abalone fishermen moved into the Channel Islands. The islands also continued to be a popular trading stop for ships from the Gold Rush and from the fishing, sealing, and freight industries. The less fortunate of these vessels were wrecked near the Channel Islands. Now, resting on the ocean floor, they are of great interest to maritime historians.

## What is Chumash culture like today?

Chumash culture in the Channel Islands is stronger today than it has been in many years. Descendants of Chumash people are rediscovering the words of their

## Radiocarbon Dating

Radiocarbon dating is a way to determine the age of a sample that was once living or contained living material (for example, bones, hair, soil, pottery, water, wooden objects). All living things contain the element carbon. A tiny part of Earth's carbon is radioactive: its structure is not stable. This carbon is called carbon-14, or radiocarbon. Once a living thing dies, the total amount of radiocarbon in its remains decreases at a measurable rate, called a half-life. A half-life is the time it takes for half the radiocarbon in a sample to disappear. By measuring the remaining carbon-14, scientists can determine when a once-living sample died.



Modern-day tomol paddlers arrive at their destination.

ancestors through the writings of anthropologists such as John P. Harrington, who began recording oral histories and narratives of Chumash elders in 1912 and continued to do so until the late 1950s.

One group, the Chumash Maritime Association (CMA), has dedicated itself to revitalizing Chumash

culture and pride through the symbol of the tomol. On September 8, 2001, paddlers completed a historic crossing of the Santa Barbara Channel in a tomol they constructed themselves using ancient methods and tools. They also received financial support from the Channel Islands National Marine Sanctuary. Hundreds of people joined their victory celebration on Limuw after the 12-hour crossing.

People like Alan Salazar of the CMA have helped renew the strength and pride of the Chumash, and of all people who are enriched by the Chumash culture. The rich Chumash artistic tradition is upheld by families like the Romeros of Santa Ynez Indian Reservation, who perform the colorful and traditional swordfish (*'elyewu'n*), seaweed, and stork dances. Julie Tumamait-Stenslie shares her people's oral traditions through storytelling and educational programs in schools and community centers. And scientists like John Johnson continue their archaeological work to piece together the history and culture of the native people of the Channel Islands.



### Journal Question

*What methods do scientists use to examine the Channel Islands' past?*

*What is something important from your family's past that your ancestors would want you to pass on?*

### Fact or Fallacy?

Archaeologists have found Chumash shell bead money in the Mojave Desert.



**Fact:** Chumash travelled 2 weeks or more to trade with tribes from the Mojave. The Chumash traded bead money for obsidian, a hard mineral used in arrowheads and spear points, and for hematite, a red mineral used in paints.

## Vocabulary

**Anthropologist** *n.* A scientist who studies the physical, social, and cultural development and behavior of human beings.

**Archaeologist** *n.* A scientist who recovers and studies remains of past human life and culture.

**Artifact** *adj.* An object made by human beings that is of historical interest.

**Generation** *n.* The average time span between the birth of parents and the birth of their children.

**Middens** *n.* Piles of discarded objects—trash heaps—found near village sites. Middens often

contain distinct layers that offer clues to life during different time periods.

**Missions** *n.* Settlements established by the Spanish in the 17th–19th centuries to recruit native populations to Christian beliefs and European ways of life.

**Oral narratives** *n.* Stories of past events, values, and family life that have been told from one generation to another without being written down.

**Tomol** *n.* A Chumash canoe from 3½ to 9 meters (12 to 30 feet) long, constructed of redwood planks, that can carry 4 to 12 people.

## Trading for Life

Winter is coming and your village needs the proper supplies to make it through. By role-playing members of a Channel Islands Native group (Chumash or Gabrielino), you will use the resources that are most plentiful in your region to trade with other groups for food, clothing, and valuable materials.

### Focus questions

How have humans used the marine and coastal resources in this region?

### Materials

*For each student*

Copy of Master A (Channel Islands language groups)

*For each group*

4 copies of Master B (tomol assembly)

Copy of Master C (Chumash trade items)

Q-tips, 2 for each tomol

Red and black paint or markers

Cloth or plastic bag (30 centimeter by 38 centimeter) for each group

Elbow or rigatoni pasta strung on string or heavy thread (to represent bead money)

Cotton balls and/or pipe cleaners (to represent clusters of plant fibers)

Small bars of soap (to represent talc/soapstone)

Craft fur (to represent deer)

Kidney beans (to represent baskets of acorns)

Popsicle-type sticks painted different colors (to represent different marine mammals)

Acrylic beads

Wood barrel beads

Small bag of seashells

Scissors

Tape or glue

### Procedure

1. Divide up into groups of three or four, with each group assigned one of the following cultural regions on **Master A**: Cruzeño on Santa Cruz, Cruzeño on Santa Rosa, Gabrielino on Santa Catalina, Mainland Barbareño, Mainland Ventureño, Mainland Cuyama. Divide up the space in the classroom so that each group “inhabits” a different geographic region.
2. Follow the directions to cut out, assemble, and decorate two tomols. Use two copies of **Master B** for each tomol. Take four Q-tips to use as paddles: two for each tomol.
3. Collect your group’s bag and resources according to the list below.
  - Santa Cruz Cruzeño: 10 strings of bead money (pasta)
  - Santa Rosa Cruzeño: 10 marine mammals (popsicle sticks painted and labeled “otter,” “whale,” “seal”)
  - Santa Catalina Gabrielino: 10 pieces of soapstone (soap)
  - Mainland Barbareño: 10 plant fibers, each representing a bundle (cotton balls, pipe cleaners)
  - Mainland Ventureño: 10 acorns, each representing a basketful (beans, peas, or acorns)
  - Mainland Cuyama: 10 deer (fur or felt)

Using **Master C**, discuss what each item represents in terms of fulfilling needs.

4. Now you are ready for the first trading period. Divide your group in half; one half will “travel,” the other will stay at “home” to trade with visitors. As a group, decide on a strategy for getting what you need and determining the value of each trade item. As you trade, keep in mind what you will need to end up with to survive the winter! (Away traders: Move your tomols to the proper region on the map and/or physically move to the group’s “village” in your room. Home traders will be trading with visiting groups.)

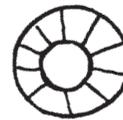
- When the trading period is over, assess whether you have obtained the items necessary to survive the winter. Try again with a second trading period, then a third.
- Did your groups end up with different numbers of items? Did some groups end up “wealthier” than others? Why might this have happened? As a class, discuss how shell money has circulated throughout the region from a single source and how trade has distributed goods to areas far from where they originated.

### Conclusion

- Why was trade important to the native groups in the Channel Islands region?
- How did the Chumash and Gabrielino economy compare to our modern-day economy? Do you think some trade items would have been scarcer than others?

### For Further Exploration

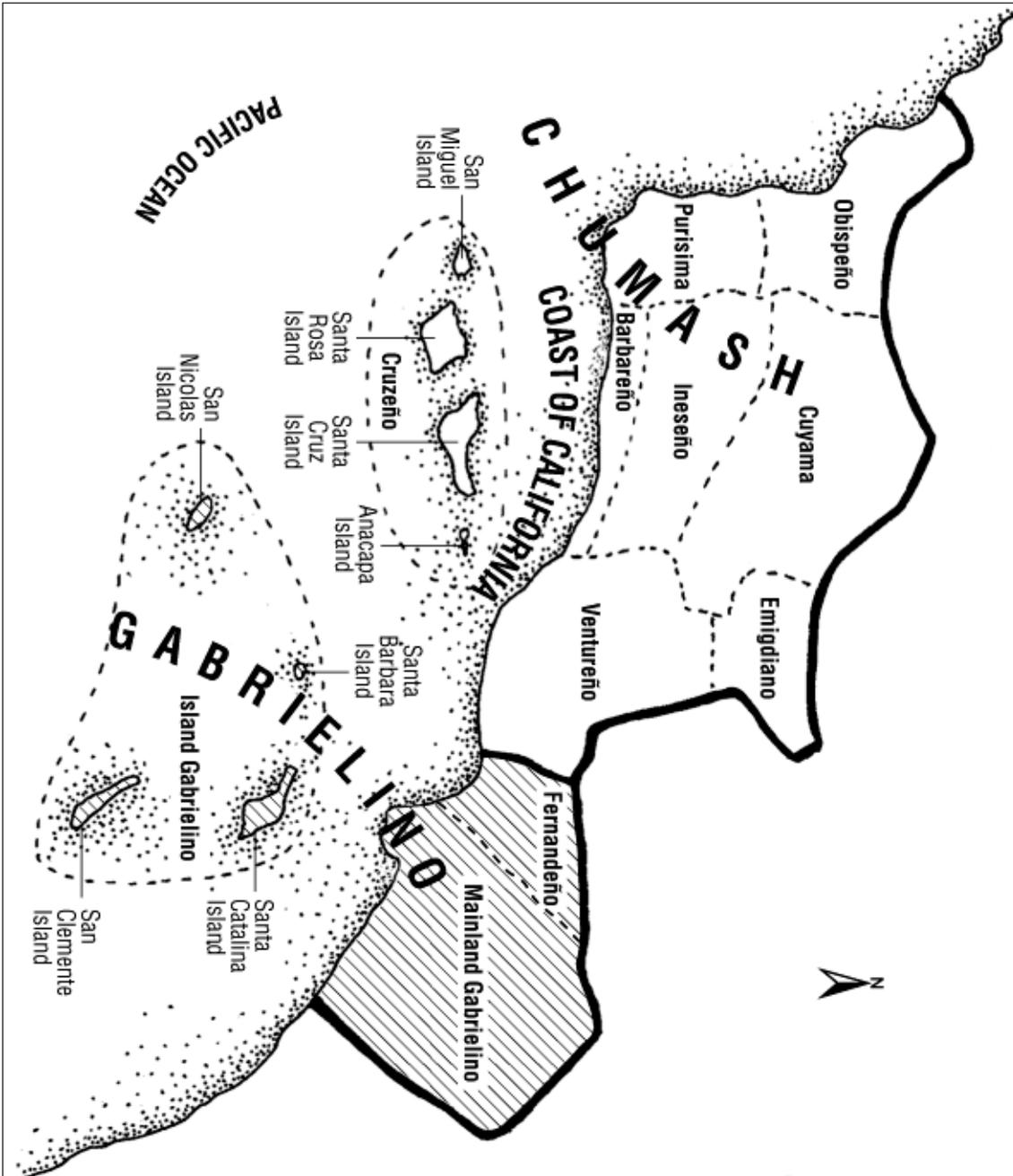
Throughout history, countries have developed currencies for exchange purposes. What determines the value of the currency you use? Research several foreign currencies and find out their exchange rates with your country’s money. Currency converters are available at a number of Internet sites, including [www.xe.com/ucc](http://www.xe.com/ucc). How does exchange rate affect trade and tourism? What types of goods that you use today come from far away and how did they get to you? Are goods or resources from your area sold to places far away?



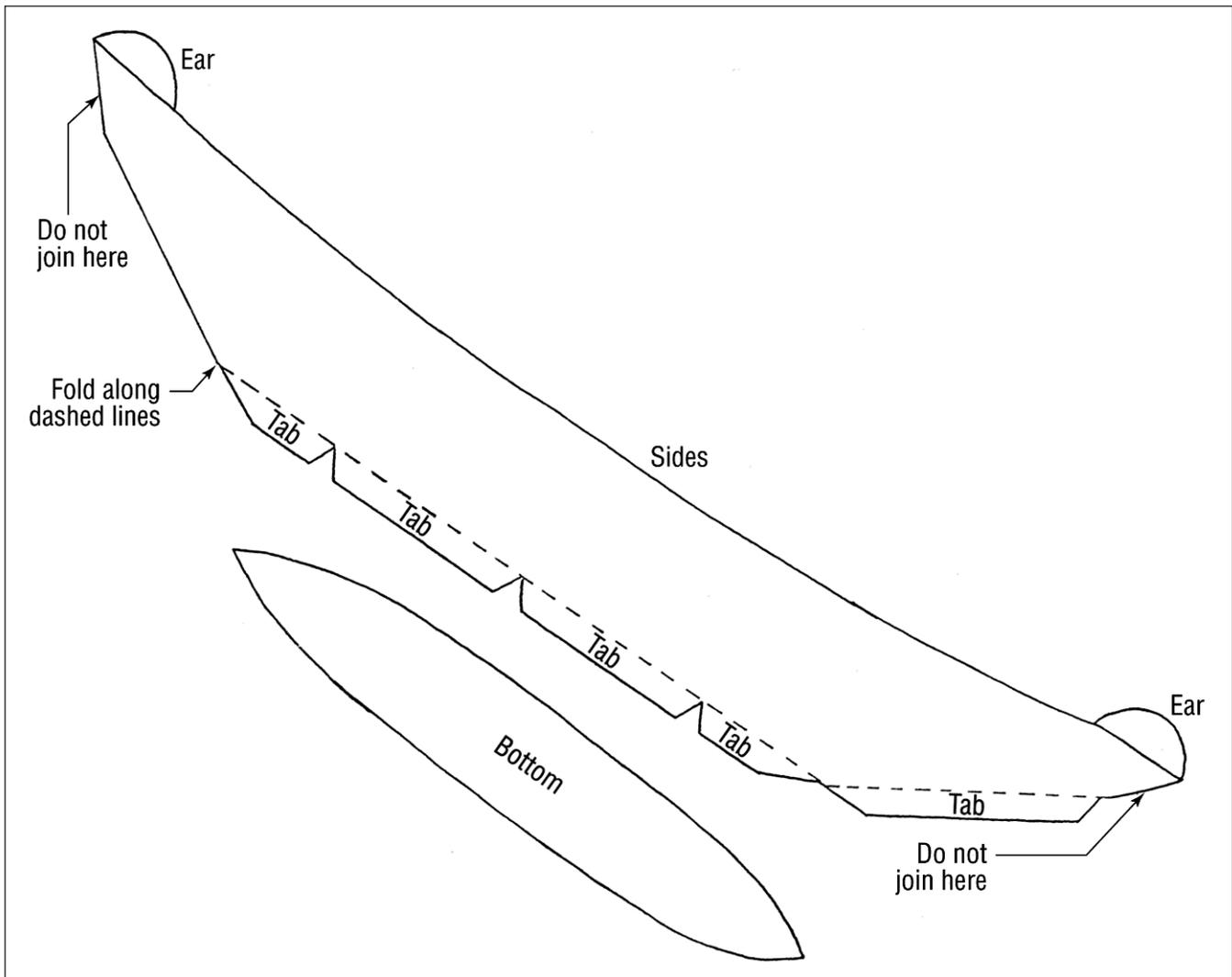
Samples of Chumash rock paintings.

# Channel Islands Region Language Groups

Courtesy of the Santa Barbara Museum of Natural History



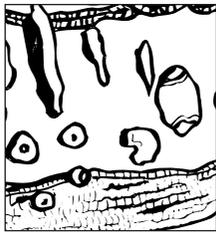
# Tomol Assembly



## Directions

1. Cut out 2 side pieces and 1 bottom piece for each canoe.
2. Color and decorate the pieces before assembling. Draw the outlines of the planks in black on the side of the canoe. Paint the canoe red.
3. Arrange the side pieces so that there is one tab at each end of the canoe. Fold along the dotted lines to make tabs.
4. Tape, glue, or staple the 2 side pieces together at each end. Do not attach the "ears" to each other; there should be a V-shaped space between them.
5. Set the bottom in place between the sides and bend the sides gently to fit. Tape or glue the bottom in place with the tabs underneath.

# Chumash Trade Items



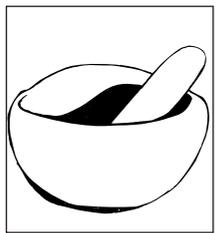
## Shell bead money and chert drills

Most shell bead money was made from olivella shells. Shells were broken into square blanks, drilled, and strung on cordage. Drills were made from a hard mineral called chert, abundant on Santa Cruz Island. After stringing the beads, their makers shaped them by grinding them on a large stone. A string of disk-shaped beads measured around the hand was called a *ponco*. The *ponco*'s value was determined by the color and quality of the beads. Abalone and mussel shells were also sometimes used to make shell bead money.



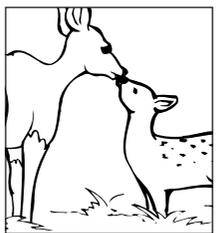
## Plant fibers

Dogbane grew only on the mainland. It was important for its fibers: with them, island dwellers bound the redwood planks they used to make tomols. Dogbane stems were used for cordage and nets. Tule or bulrush was another important fibrous plant. It was used for thatching, mats, sandals, and skirts, as well as balsa (reed bundle) canoes.



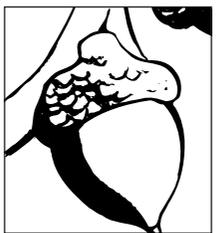
## Steatite (soapstone)

The mineral steatite occurred naturally only on Santa Catalina Island in the southern Channel Islands. All native groups in the area valued the stone: they made steatite cooking bowls and frying pans, pipes, charms, beads, ornaments, and "doughnut stones" that served as weights on digging tools. It is soft and easily carved, and does not break when heated.



## Deer

Deer were found only on the mainland, but had so many important uses that they were sought in trade by island dwellers throughout the region. Deer meat was eaten and deer bones were used for whistles, flutes, tools, and fishhooks. Sinew was used for bowstrings and the backs of bows, and antlers were used as wedges and tools to make arrow and spear points. The skins were made into clothing, and the hoofs were often used as rattles.



## Acorns

Acorns, the fruit of oak trees, were a staple food. They were often ground, leached to remove bitter acids, then cooked into a thick mush. This bland but filling mush was usually eaten with meat, fish, or other dishes. Acorns were also used in ceremonies and ornaments. Oak trees did grow on the islands, but many island dwellers still received a large percentage of their acorn supply through trading with mainland villages.



## Marine mammals (otter, seal, sea lion, whale)

The island dwellers ate seals and sea lions. They also used their skins for capes and blankets, drilled holes in shells with their whiskers, and made tools from their bones. Sea otters were highly valued for their furs, which were also used in capes and blankets. Whale meat and blubber were eaten; whale rib bones were used as pry bars and wedges, and in the doorways of houses. Seals, sea lions, and otters were hunted by Island Chumash and traded to mainlanders. Whales were not hunted, but used when they washed ashore.





## Dig It!

In this activity, you are an archaeologist and anthropologist. Analyze the contents of a midden and compare it to your own trash. Then assume the identity of an imagined culture and prepare a box of “archaeological artifacts” for discovery and analysis by other members of the class.

### Focus questions

What methods do scientists use to examine the Channel Islands’ past?

What makes this area unique for historical research?

### Materials

*For each student*

Copy of Master D (pie chart)

Copy of Master E (diagram of Chumash midden)

Colored pencils

Protractor

*For each group*

Plastic shoebox, ice cream bucket, or similar tank

Sand or outside dirt, enough to fill the box

Whisk broom or brush

Tongue depressor, popsicle stick, or similar

Mason’s trowel or other small shovel

Sieve

Tape measure

Paper bag containing 5 “artifacts”

Graph paper

### Procedure

#### Part A: Examining a Midden

1. What can you learn about a culture from what the culture discards? Keep track in your JASON Journal of what you throw away in 1 day. Estimate percentages of different categories of

items (food waste, packaging, paper waste, and so on). Then use your protractor to construct the “Personal Garbage” pie chart on **Master D**. *Hint: To convert your categories into wedges of a pie chart, you need to convert percentages to degrees in a circle. Use this equation:*

$\%/100 = n/360$ , where  $n$  = number of degrees.

*For example, if 25% of your waste was from food, the equation would be  $25/100 = n/360$ , where  $n = 90$  degrees. You would use your protractor to mark off 90 degrees.*

2. Compare your results with other students’ results, then fill in the “Composite class garbage” pie chart to represent your class averages. How would you get a more complete picture of discards for your whole town, state, or country?
3. A midden is very similar to your own trash basket. But instead of holding the discards of a single day, middens hold discards from hundreds or thousands of years. Analyze the contents of the midden on **Master E**. How do the different layers overlap with Early, Middle, and Late Chumash periods? Discuss changes over time in foods consumed and tools used. Can you tell when humans first arrived? How?
4. Using percentages and categories from the Master (e.g., artifacts, mussel shells, olivella shells), construct pie charts for the contents of the surface, upper, and lower layers. What do you think the items represent in terms of use? Compare them with the pie charts of your own garbage. Discuss what you can learn about how a culture uses resources by analyzing what it throws away.

#### Part B: Using Archaeological Methods

5. Break up into groups of five. Each group represents a different imaginary culture.
6. Receive a box filled with sand and a bag with five “artifacts” that represent different aspects of your culture. As a group, decide what each object is used for and write a brief description. These objects may be familiar, but it’s your job to redefine them as they are used in your culture. For example, a spoon could be a planting tool.

7. Bury the artifacts in your box at different depths, and exchange boxes with another group.
8. Following the rules for an archaeological dig (see below), unearth the objects from the box your group is given, one at a time. Make sure everyone in the group has a job to do. Assign each member to be responsible for one of the rules for all five objects, or have each member follow all five rules to recover and document one object.
9. When the boxes have been thoroughly analyzed, take turns presenting your group's "findings" to the class. Discuss how archaeologists and anthropologists draw conclusions about the artifacts they find, and how they verify their findings. Can they ever be wrong?

**Conclusion**

1. How does resource use in the Channel Islands compare through different periods of Chumash history?
2. What are some of the important aspects of an archaeologist's job? Do you think some of this work is creative? Why or why not?

**Rules for an Archaeological Dig**

- Make a map of your "site" using a tape measure to mark off the area onto a piece of graph paper.
- As you find each object, record its location and depth on the graph paper.
- Use the trowel and broom to unearth the objects as carefully as you can. If an object is very small, use a sieve to sift the earth away from it.
- Draw the object in situ (where it was found). Draw it again once you have removed it from the site.
- Write a description of the object, along with your hypothesis about its use.

**For Further Exploration**

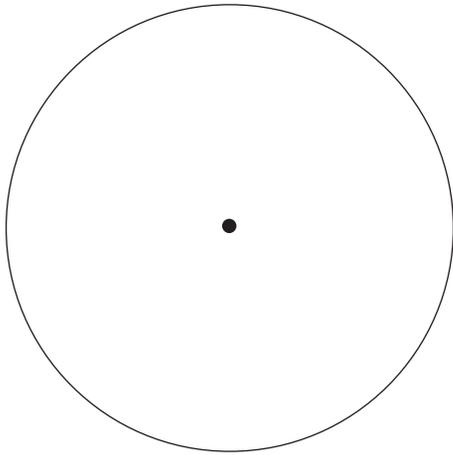
Write a script for a brief play in which you act out the uses for each of the objects from your "culture." Present this play at the conclusion of the activity. Visit local archaeological sites that might be open to visitors, or local museums or historical societies. What can you learn about human history in your own area?



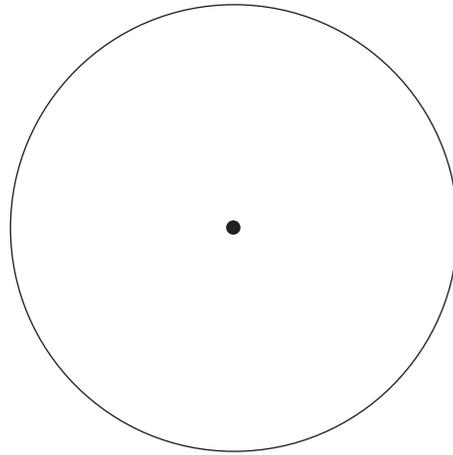
Samples of Chumash rock paintings.

Exercise 2.2

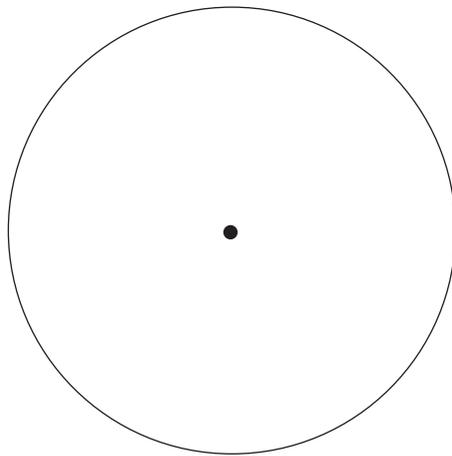
# Pie Charts



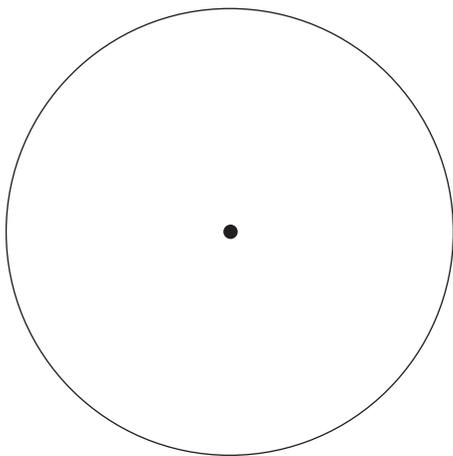
Personal garbage



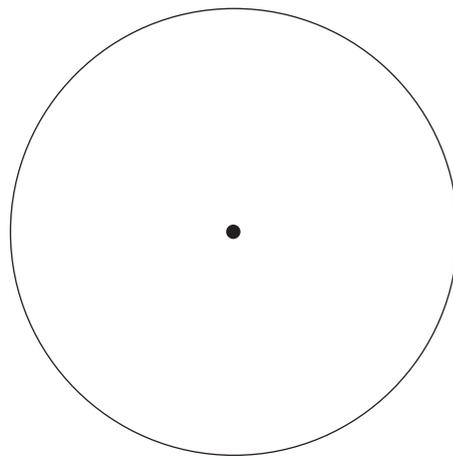
Composite class garbage



Surface layer

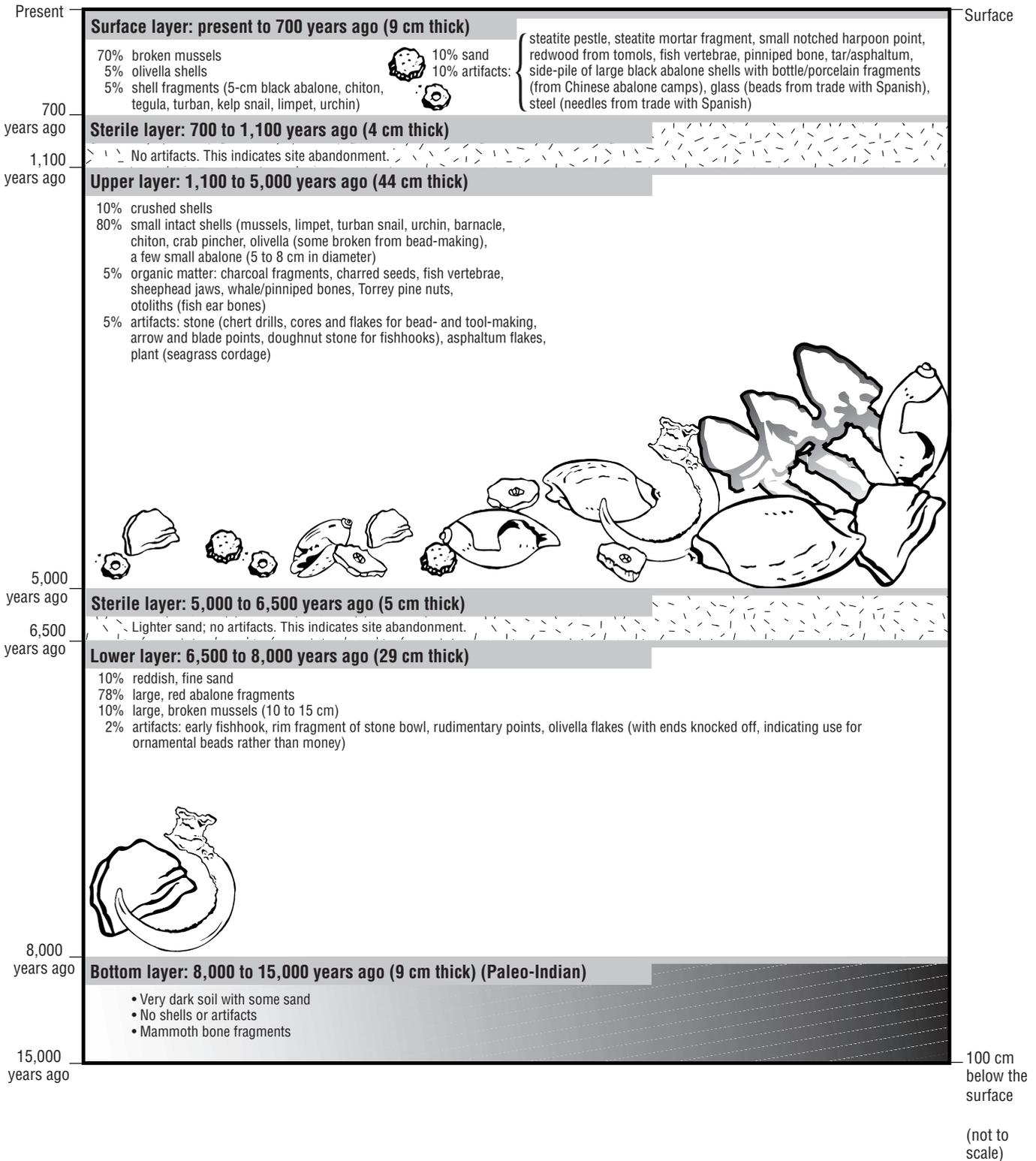


Upper layer



Lower layer

# Diagram of a Chumash Midden



## Trapped by the Channel

The Channel Islands region has been a center of maritime culture for thousands of years. This activity tests your skills at pinpointing locations in a game that simulates the discovery of historic shipwrecks. Through the game, you will also interpret details of the shipwrecks to learn about the uses and hazards of the channel through different historical periods.

### Focus questions

What kinds of vessels and cargo travel through the Santa Barbara Channel?

What hazards did vessels face?

### Materials

Copy of Master F (navigational chart) (for each student)

Copy of Master G (sampling of shipwrecks) (on cardstock, cut up into cards—for each student pair)

Information from Master G mounted as a display (for each student pair)

Large blank timeline

Clipboard (for each student)

### Procedure

1. Take a copy of **Master F** to use as your game board, then pair up with another student. In your pairs or as a class, review latitude and longitude before you begin. Find the approximate latitude and longitude of each of the islands on your chart.
2. Select a card from the pile, not showing it to your partner. This is your shipwreck. It contains information about the time period and purpose of your ship's voyage, as well as the exact coordinates of latitude and longitude where it went down. Concealing the card and your game board from your partner, mark the location of your wreck using the coordinates on the card.
3. Take turns with your partner trying to guess the locations and names of each other's wrecks. You may ask two types of questions:

- Related to latitude and longitude (is your shipwreck north of latitude 33° 50') or vicinity.
  - Related to characteristics of the ship (cargo, date, and so on). On each turn, you are allowed just one "yes" or "no" question. Use the display board to divide the ships into categories and narrow your choices. *Hint: Some possible categories are wrecks near a particular island, wrecks in 19<sup>th</sup> versus 20<sup>th</sup> centuries, ship type (freighter, fishing vessel, passenger), and type of wreck.*
4. To win the game, you must be able to give the exact coordinates of your partner's shipwreck and name the vessel. Keep track of your questions and answers before giving the ship's name.
  5. When both shipwreck locations have been determined, mark the vessel and the type of vessel and cargo on the timeline posted on the bulletin board or blackboard.
  6. Discuss what shipwrecks can tell us about the history and uses of the Channel Islands or of any area. Talk about some of the dangers these ships encountered.

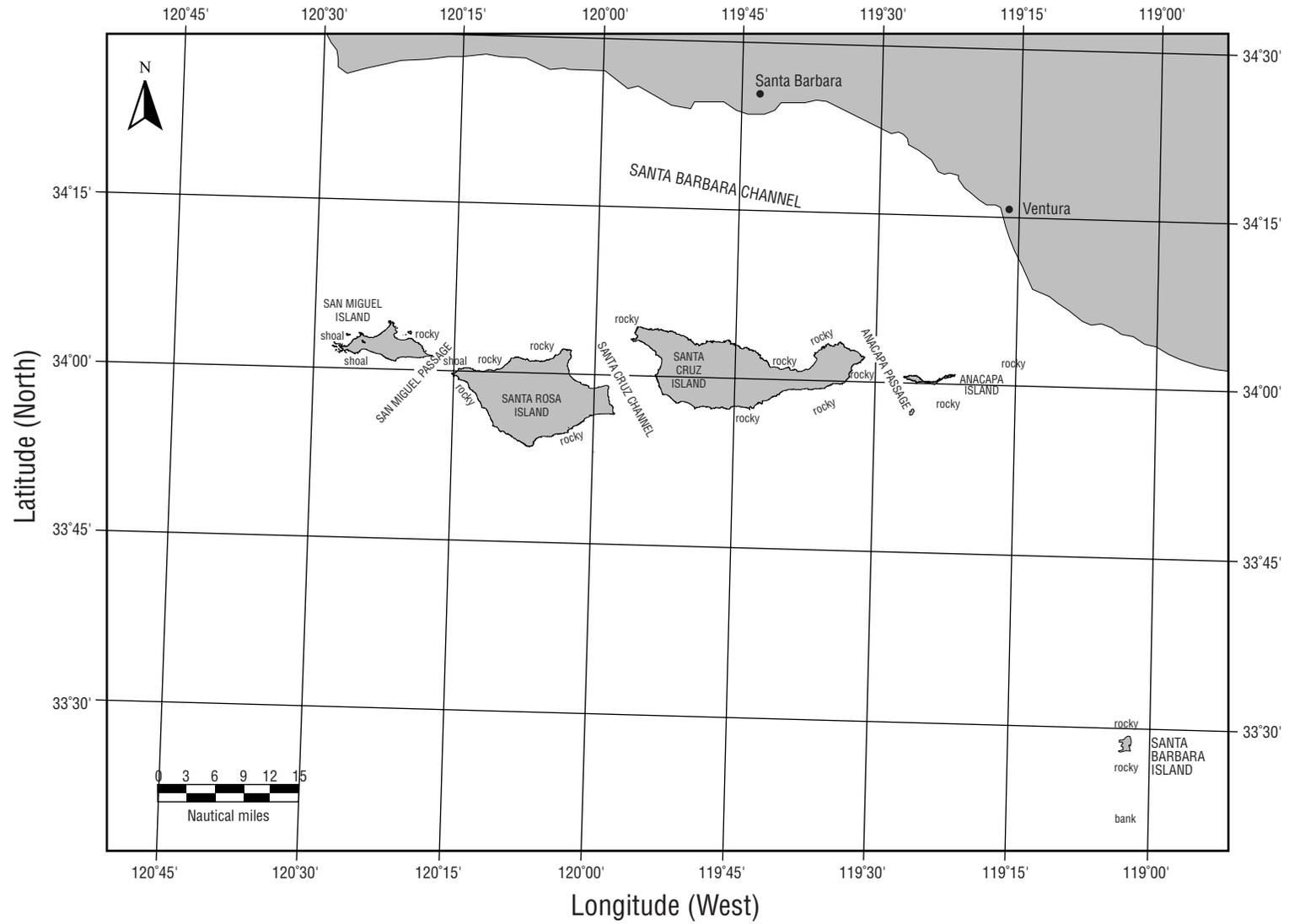
### Conclusion

1. What types of vessel use the Channel Islands area as a trade route, and during what periods did these activities occur?
2. Why do you think there are so many shipwrecks in the waters surrounding the Channel Islands? Why is there such a variety of shipwrecks?

### For Further Exploration

Visit the shipwreck database developed by the Channel Islands National Marine Sanctuary, ([www.cinms.nos.noaa.gov/shipwreck/cinms1.html](http://www.cinms.nos.noaa.gov/shipwreck/cinms1.html)) to learn more about the islands' archaeological treasure trove of wrecks. Expand the game to include additional shipwrecks. Research the causes of the shipwrecks and construct graphs showing reasons for the wrecks, how many wrecks were close to each of the islands, and what types of ship have been recovered using all of the ships in the database. If you live in a coastal region—or along the Great Lakes—visit a maritime museum to explore maritime history in your own area.

# Navigational Chart of the Channel Islands



# Sampling of Shipwrecks in the Channel Islands Waters

<p><b>Adriatic</b>                      Year of wreck: 1930                      Type: fishing vessel (purse seiner)                      Cargo: fish (sardines)                      Closest island: Santa Barbara                      Nature of wreck: sank                      Lat: 33° 23' N, long: 119° 06' W</p>	<p><b>Winfield Scott</b>                      Year of wreck: 1853                      Type: passenger (side-wheel steamer)                      Cargo: gold bullion                      Closest island: Anacapa                      Nature of wreck: stranded                      Lat: 34° 01' N, long: 119° 23' W</p>	<p><b>Aggi</b>                      Year of wreck: 1915                      Type: greighter (three-masted)                      Cargo: barley and beans                      Closest island: Santa Rosa                      Nature of wreck: stranded                      Lat: 34° 01' N, long: 120° 14' W</p>	<p><b>G.W. Prescott</b>                      Year of wreck: 1879                      Type: lumber (two-masted schooner)                      Cargo: lumber (railroad ties)                      Closest island: San Miguel                      Nature of wreck: stranded                      Lat: 34° 01' N, long: 120°27' W</p>
<p><b>Blue Fin</b>                      Year of wreck: 1944                      Type: government (California Fish and Game patrol)                      Cargo: none                      Closest island: Santa Rosa                      Nature of wreck: stranded                      Lat: 33° 56' N, long: 119° 57' W</p>	<p><b>Kate and Anna</b>                      Year of wreck: 1902                      Type: sealer                      Cargo: seals                      Closest island: San Miguel                      Nature of wreck: stranded                      Lat: 34° 03' N, long: 120° 21' W</p>	<p><b>Chickasaw</b>                      Year of wreck: 1962                      Type: freighter                      Cargo: toys, dishes, shoes                      Closest island: Santa Rosa                      Nature of wreck: stranded                      Lat: 33° 53' N, long: 120° 07' W</p>	<p><b>H.T.P. Co. IX</b>                      Year of wreck: 1921                      Type: freighter                      Cargo: fish                      Closest island: Santa Barbara                      Nature of wreck: burned                      Lat: 33° 27' N, long: 119° 02' W</p>
<p><b>Comet</b>                      Year of wreck: 1911                      Type: lumber (three-masted schooner)                      Cargo: lumber                      Closest island: San Miguel                      Nature of wreck: stranded                      Lat: 34° 03' N, long: 120° 23' W</p>	<p><b>Dante Alighieri II</b>                      Year of wreck: 1938                      Type: fishing vessel (purse seiner)                      Cargo: fish                      Closest island: Santa Barbara                      Nature of wreck: stranded                      Lat: 33° 27' N, long: 119° 02' W</p>	<p><b>Goldenhorn</b>                      Year of wreck: 1883                      Type: freighter (four-masted bark)                      Cargo: coal                      Closest island: Santa Rosa                      Nature of wreck: stranded                      Lat: 33° 58' N, long: 120° 13' W</p>	<p><b>Wampus, a.k.a. Grey Ghost</b>                      Year of wreck: 1926                      Type: rum runner                      Cargo: liquor                      Closest island: Santa Cruz                      Nature of wreck: stranded                      Lat: 33° 59' N, long: 119° 39' W</p>
<p><b>Legend</b>                      Year of wreck: 1967                      Type: yacht (racing)                      Cargo: none                      Closest island: San Miguel                      Nature of wreck: stranded                      Lat: 34° 01' N, long: 120° 27' W</p>	<p><b>Lady Christine</b>                      Year of wreck: 1997                      Type: fishing vessel                      Cargo: none                      Closest island: San Miguel                      Nature of wreck: stranded                      Lat: 34° 03' N, long: 120° 23' W</p>	<p><b>Lotus</b>                      Year of wreck: 1922                      Type: passenger                      Cargo: none                      Closest island: Anacapa                      Nature of wreck: burned                      Lat: 34° 00' N, long: 119° 11' W</p>	<p><b>Eros</b>                      Year of wreck: 1966                      Type: yacht (yawl-rigged)                      Cargo: none                      Closest island: Anacapa                      Nature of wreck: sank                      Lat: 33° 57' N, long: 119° 24' W</p>





**SHOW WHAT YOU KNOW!**

**What's the Evidence?**

**Skills: Drawing Conclusions, Applying Knowledge**

**Your Challenge**

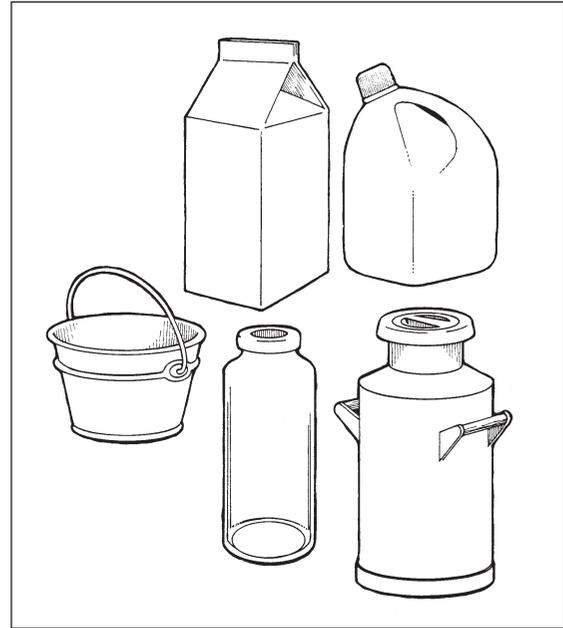
You are an archaeologist who has discovered a number of containers in a local garbage dump near a major urban center that has just celebrated its 100<sup>th</sup> birthday. On further examination, you notice that each container has a different shape, but all were designed to hold milk. You feel that the containers may reveal clues about how the people from the city received milk over the past 100 years. Your challenge is to determine when each container was used and what historical events were taking place when it was used.

**Words, Words, Words**

Think about these vocabulary words as you work: *archaeologist, artifact, midden.*

**Helpful Hints**

1. Make a timeline by cutting out each of the milk containers and ordering them from oldest to newest. The timeline can begin with 1900 and end with 2000.
2. Examine each container and determine what it is made of. Record the material on the container.
3. Approximately when in the last 100 years do you think people used this material to carry milk? Record the year on the container.
4. What story does each container tell about the people who used it? Record the answer in your JASON Journal.



Milk containers.

**Assess Your Work**

Use this chart to assess your own work.

Skills and Steps	Yes	No	Not Sure
Made a milk carton timeline.			
Identified milk carton materials.			
Recorded what each container tells about the people who used it.			

**Conclusion**

1. Did the materials used to produce the container change over time? If so, how?
2. Do the materials used to make the containers relate to how people were using the containers?
3. What can a container tell us about the people who used it and the time they lived in?

## TEACHER LINKS 2

**Mathematics Links****Model the Radiocarbon Dating Process.**

Create a box of “remains” by labeling items such as shells, bones, or teeth with a hypothetical percentage of carbon-14 remaining. Using the half-life of carbon-14 (5,568 years), have students calculate when each organism lived. The K-12 section of the Radiocarbon Webinfo site, [www.c14dating.com/k12.html](http://www.c14dating.com/k12.html), answers common questions about radiocarbon dating.

**Language Arts Links**

**Gathering Oral History.** Have students listen to Chumash storytellers relate stories from Chumash oral narratives on Team JASON

Online. Discuss the material as a class, then ask students to interview an elder in their own community and compile a book of oral narratives. Or have students delve into their own family histories. Have each student prepare one of these stories and present it to the class.

**Arts Links**

**Build a Tomol** Have students make tomols out of popsicle sticks and glue mixed with black paint. Have students study drawings and photographs of actual tomols, then design their own. Remind students that the popsicle sticks represent redwood planks and the black glue replaces the yop, made from tar and pine pitch. Have students paint their tomols with red, black, and white based on Chumash designs.

**Make Chumash Ceremonial Items.** Have students make a bullroarer by drilling a hole in one end of a paint stirrer (about 23 by 5 centimeters) and stringing it with a piece of twine about 64 centimeters long. Have them decorate the bullroarer with Chumash designs using red and black paint or markers. Make the sound by holding one end of the string over your head and twirling it around. Bullroarers were used to call people to ceremonies or warn people away. Students could also make “deer hoof” rattles out of egg cartons and yarn: cut up egg cartons into sections and string them together into bundles of two or three sections, then add shells or buttons to make the rattles noisier. Hold them in your hand, attach them to a stick or tie them around your ankle, and SHAKE!

**Novel Links**

**20,000 Leagues under the Sea.** Captain Nemo discusses the effect of a first-world culture taking advantage of the Indian pearl divers. Are there any comparisons with the effect of European settlement in Chumash territory?

**Island of the Blue Dolphins.** Compare how each of the following work with cultural artifacts to understand events: JASON researchers, the characters in the book, and the author, Scott O’Dell.

**The Voyage of the Frog.** Compare the *Frog* and a Chumash tomol. How are they alike and how are they different? Build a scale three-dimensional model of the *Frog*.

**The Case of the Missing Cutthroats.** How do the activities of the characters affect the natural resources? Contrast the history of recreational fishing with Chumash attitudes toward fishing.

**Zia.** Trace Zia’s family roots and how she came to live at the mission. Determine where Karana fits into Zia’s family history. Compare the views of the mission’s history from the perspectives of the padres and the Chumash chief.

**Web Links**

[www.sbnature.org/htmls/chumash.html](http://www.sbnature.org/htmls/chumash.html)

Santa Barbara Museum of Natural History Web site with information on the Chumash.

[www.chumashmaritime.org](http://www.chumashmaritime.org) Chumash Maritime Association Web site.

[www.designplace.com/chumash](http://www.designplace.com/chumash) Web site of Oakbrook Regional Park’s Chumash Interpretive Center.

[www.sbmm.org](http://www.sbmm.org) Web site of the Santa Barbara Maritime Museum.

**Technology Links**

**For Exercise 2.1,** have students use a spreadsheet to record and monitor exchange rates between different Channel Island commodities.

**For Exercise 2.2,** have students create a spreadsheet template for recording what is thrown away. Try having students compile data electronically and compare graphs of their trash to the whole group totals. In the second part of the exercise, tell students to keep a record of items with a digital camera. Consider having them take field notes electronically or annotate digital photos with image processing software.

## Teacher Preparation 2.1

### Trading for Life



#### Time Required

(two 45-minute periods, 1½ hours total: one for background and setup, one for trading)

#### Complexity

Medium

#### Additional Preparation

1. Divide the classroom up into geographic regions based on the **Master A** map. Put some desks together to represent an island or make drawings on a blackboard to represent the mainland. Use props like oak leaves, shells, stuffed animals, or models or drawings of rocks or trees to set the stage. If you assign groups several days in advance of the “trading period,” ask groups to construct scenery during free periods. If time allows, have groups research different parts of Chumash culture and report back.
2. If acorns occur where you live, use the real thing. Also try other native foods as trade items, such as sunflower seeds, walnuts, or chia, as available.
3. Copy **Master B** onto red construction paper. Or, instead of having student groups assemble paper tomols, have them make models out of popsicle sticks. (See the Arts Links.) This should be done ahead of time, as a separate activity. If you plan to have students move their tomols on **Master C**, enlarge the map.
4. Set a time limit for trading, such as 15 minutes, and have an alarm or buzzer go off at the end. After the period, analyze the ability of each group to survive based on the items accumulated. Make up your own rules; for example, each group must have at least one animal for each member (marine mammals or deer), one block of steatite, one bundle of plant fibers per tomol, and one basket of acorns for each member. Adjust groups according to consequences: for example, if a group fails to get plant fibers, remove a tomol,

since fibers are needed to build them. If a group fails to trade for acorns (a food staple), it loses a member to another tribe that has a surplus. Try three 15-minute sessions. Then analyze the impact of trading decisions on groups.

## Answers to Questions

### Conclusion questions

1. Since resources on the islands were often limited, trade allowed people to get the variety of goods they needed. Trade also allowed certain groups to specialize in one particular item, such as shell bead money or steatite cookware.
2. Answers will vary. Their economy was based partially on a currency system of shell bead money, but barter, or exchanging one set of goods for another, was also very important. Trade allowed for a wider distribution of goods and cultural influences, although not as wide as today.

## Adaptations

### For elementary school students

Make an 11-inch by 17-inch mat for each group consisting of **Masters A** and **B**. Allow them to mark their village site and possible trading routes on the mat, and to spread out their resources there. Also, have groups make only one trade per shortened period. Mention that major highways in California were once foot trails used by Native People as trade routes.

### For high school students

Older students may wish to use pictures of items rather than objects. Introduce the concepts of supply and demand and scarcity when discussing trading results. Have students research the Chumash and Gabrielino to learn about other resources and goods that may have been traded and used, and make the game more complex by adding these items. Or have culture groups devise their own trade items and discuss changing usages.

## Teacher Preparation 2.2

### Dig It!



### Time Required

One day (for trash tally), plus 1½ to 3 hours (two to four 45-minute periods: one for Part A, two or three for Part B)

### Complexity High

### Additional Preparation

- Several weeks before the activity, post a list of household objects for students to bring in. (Each student can bring in one item.) Don't tell them what they are for. These objects will be the "artifacts," which you will group in set of five and place in the paper bags for Part B. Possibilities for your list: spoon, battery, paper clip, compact disc, ballpoint pen, dental floss, toothbrush, meat thermometer, lipstick, key. Be sure not to list anything sharp that could cause injury, and tell students to bring in things that can get dirty.
- Break this activity up into at least two classroom sessions. First assign Step 1 as homework and follow up with the rest of Part A the following day. Part B can be done in one session, but would probably be better with two or three. You could collect the boxes after Step 4 to make the exchange the next day, then ask student culture groups to bring in props and costumes from home to enhance their play.
- Explain to students that middens on the Channel Islands can range from 45 centimeters (18 inches) to 1½ meters (5 feet) deep. A layer with no artifacts is typical, and means the site was abandoned for a period of years. Few middens or dig sites in the Channel Islands contain artifacts from before 8,000 years ago, because the ocean level was 400 feet lower then. Because villages tended to be built near shore, most of these sites are now underwater! Someday, with better techniques for underwater archaeology, we may find much more.

- Tell students that the Channel Islands are one of the most valuable sites in North America because of their relative isolation and undisturbed character. There are 5,000 to 10,000 sites on the big islands. Emphasize that fossils or artifacts should always be left where they are found, because location tells a large part of the story. In the Channel Islands, no sites are disturbed unless necessary to protect the artifacts (for example, where erosion might wash an area into the sea).
- A couple of interesting sources for additional exploration are David Macaulay's *Motel of the Mysteries* and Horace Miner's essay "Body Ritual among the Nacirema." Both of these deal humorously with "artifacts" of modern culture.

### Answers to Questions

#### Procedure questions

- Answers will vary, but may include learning what they ate, what they wore, and what tools they used.
- Layers do not correspond exactly to the historical periods. This is because the changes represented by the periods occurred gradually over many years, but habitation of the site occurred at very specific times. The more recent layers contain more evidence of fishing and tool use, and marine mammal remains. Humans arrived sometime after 8,000 years ago.
- Most items represent garbage from food consumption, some tools.
- Archaeologists base their conclusions on multiple findings and correlating their information with that from other archaeologists and other sites. Some conclusions are educated guesses, and may be revised when more evidence is found.

#### Conclusion questions

- The Chumash began to use more resources from the sea after the invention of the tomol. Later periods saw more fishing and hunting of marine mammals, and more sophisticated tools were used. Also in later periods, one can find evidence of objects not native to the site, i.e., traded objects.
- Recording findings accurately and thoroughly, being careful not to disturb the site. Interpreting findings.

## Adaptations

### *For elementary school students*

Instead of having students bury their artifacts, focus on the cultural play described in the extension. Have them use props and costumes to act out cultural scenarios. Have each group act out its play without other groups seeing them, then leave their artifacts, props, and costumes at the “site” to be discovered, documented, and analyzed by the class.

### *For high school students*

Have students make a museum exhibit of “artifacts” from their own culture, using actual objects, drawings, and descriptions. Challenge them to think about what objects will be significant in teaching future cultures about our ways of life, as well as which objects are most likely to endure for hundreds or thousands of years

## Teacher Preparation 2.3

### Trapped by the Channel



**Time Required** 45 minutes

**Complexity** Medium

### Additional Preparation

1. Review with students the concepts of latitude and longitude (refer to the JASON Atlas) and practice with Atlas maps or maps or globes in your classroom.
2. You may wish to have each pair of partners work with only one ship at a time: one student plots a ship and the other tries to determine the wreck’s location and name, using the process of elimination. Once the wreck is identified, students switch roles. Encourage students to carefully record their questions and responses.
3. Enlarge **Master F** or use a map of the area to plot the “recovered” wrecks.
4. The answer key showing shipwreck locations is provided on a separate page. Good maps of the Channel Islands are also available online at [www.cinms.nos.noaa.gov/maps](http://www.cinms.nos.noaa.gov/maps).

5. Using the Digital Lab “Navigating the Channel Islands,” students can explore channel hazards and navigational techniques and aids, such as radar, sonar, and lighthouses, in more detail.

### Teacher Take Note

To speed up the game, if one student makes a wrong guess for latitude and longitude coordinates, have his or her partner tell that student how many degrees and minutes he or she is away in each direction, or in which cardinal (N, S, E, W) or ordinal direction (NW, NE, SE, SW) the shipwreck lies.

## Answers to Questions

### Conclusion questions

1. The Chumash used tomols. In the late 1800s and early 1900s, schooners were used for sealing; masted ships and sidewheel steamers were used to transport gold bullion, coal, and lumber. In the mid-1900s, purse seiners were used for fishing; freighters were used for food and a variety of goods. In the late 1900s, more recreational vessels were used.
2. Unpredictable weather and dangerous hidden rocks cause the shipwrecks. The wrecks are so varied because the Santa Barbara Channel is an important “shortcut” down the coast for many types of vessels.

## Adaptations

### *For elementary school students*

Locate the shipwrecks as a class, or have students play “20 Questions” against the teacher. Project or hang a large map of the Channel Islands at the front of the classroom so that shipwrecks can be located and have students draw pictures of the ships to place on a classroom timeline.

### *For high school students*

Use bathymetric charts of the region to determine depths of the wrecks and play the game in three dimensions. Depending on depth, challenge students to determine how they might explore the wreck (on land, using snorkel, scuba, etc.). What are the limits of increased depth on the body and human endurance?

# Navigational Chart of the Channel Islands Answer Key

