

“Arlington Springs Man”

Resource Summary: Study guide questions for viewing the video with answer key, vocabulary worksheet relating to Santa Rosa Island, additional articles about the island and Arlington Springs Man, maps of the current and prehistoric island.

Subject Areas: science, human geography

Grade Level Range: 5-10

Standards:

CCSS.ELA-LITERACY.WHST.9-10.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

CCSS.ELA-LITERACY.WHST.9-10.2.D

Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.

Resource Provided By: Lucy Carleton, English/ELD, Carpinteria High School, Carpinteria Unified School District

Resource Details:

“Arlington Springs Man”
Running time 9 minutes.

Cast:

Dr. Jon Erlandson, archaeologist, University of Oregon

Dr. John Johnson, curator of anthropology, Santa Barbara Museum of Natural History

Don Morris, archaeologist Channel Islands national Park (retired)

Phil Orr, (non speaking role) Curator of anthropology Santa Barbara Museum of Natural History

Study Guide "Arlington Springs Man" *The West of the West*

1. Define strata:
2. In what ways is Santa Rosa Island just like a layer cake?
3. Why is Santa Rosa Island such a perfect place for archaeologists and geologists to study?
4. What caused the formation of the prehistoric mega-island Santarosae (Santa Rosae) and which of the current Channel Islands were part of it?
5. How far can a modern-day elephant swim? What can you conclude about how mammoths arrived to the islands?
6. The pygmy mammoths of the Channel Islands are thought to have evolved from what animal? Why would an animal living on an island evolve to become smaller?
7. Pygmy mammoths disappeared about the time Native Americans showed up on the islands. What conclusions can you draw from this?
8. What archaeological techniques did you see in the video of Phil Orr that would fall under the "not approved" by today's standards category?
9. What lucky accident caused Phil Orr to find the human femurs protruding 37 feet under the existing surface?
10. What did Phil Orr do with the bones of the Arlington Springs man? How did they come about to be rediscovered?
11. Why was it shocking to many people that the bones on the island were 13,000 years old?
12. What idea did an ecologist come up with concerning coastal migration?
13. John Johnson says, "What does it all mean?" What does he feel is the value from studying archaeology? What applications can you see from his response?
14. What does Don Morris say is the next frontier?

Answer key

1. In geology, a **stratum** is a layer of rock or soil that is distinct from those above and below it. Rock and soil **strata** (notice the plural form) can be seen in road cuts, cliffs, quarries, riverbanks, and sand dunes, and in pieces of limestone, slate, and shale.
2. Answers will vary, but this simile with cake certainly has a positive connotation.
3. There are no burrowing animals on the islands so there is nothing to disturb archaeological sites.
4. During the Ice Age 20,000 years ago the ocean level was much lower as much of the water was encapsulated in ice. San Miguel, Santa Rosa, Santa Cruz, and Anacapa all were part of this large island.
5. There are documented cases of elephants swimming over 20 miles. It certainly seems feasible that mammoths could swim to the islands.
6. It is believed pygmy mammoths evolved from the much larger Columbian mammoths. Islands have limited resources, therefore smaller would be better.
7. Perhaps the Native Americans were responsible for the demise of the pygmy mammoths.
8. He uses a small tractor to scrape the ground. He also uses dynamite and a pick axe as excavation tools.
9. He liked to drive his Jeep around the island and when the Jeep got mired down and they were trying to extricate it from the mud, they looked up and saw a femur sticking out of the wall of the canyon.
10. Phil Orr did the correct thing and wrapped the bones and the soil matrix in plaster and gave it to the Santa Barbara Museum of Natural History. Don Morris visited the island and was told about the remains from a ranch foreman. He also had read Orr's book the pre-history of Santa Rosa Island. He asked John Johnson about the bones and they found them deep down in the sub basement.
11. Most people thought that the Americas were populated down from Alaska in the interior of the continent and that seafaring, island colonization, and coastal adaptation did not appear much later during the ensuing millennia.
12. An ecologist came up with the idea of the coastal Highway. From Japan to Baja California there are kelp beds where there are the same suites of animals, fish and shellfish and it could be that people in canoes could have followed the kelp beds down the coast, around glaciers, to finally settle in California.
13. Johnson says it is the history of our species and it is interesting to see human behavior at different time periods and the challenges they faced, such as environmental challenges, and how they responded. We get a greater understanding of how cultures changed through time and of the behavior of our own species. Certainly environmental changes will be a theme throughout human history and may be accelerating.
14. The next frontier is the part of the island that is submerged underwater, he says we have barely begun to scratch the surface of studying what might be archaeological sites located there on now underwater portions of Santarosae.

Additional Resources:

Santa Rosa Island Facts

Santa Rosa Island was included as part of Channel Islands National Park upon the park's inception on March 5, 1980. However, it wasn't until December 1986 that the island came under the ownership of the National Park Service.

Located 40 nautical miles from the Channel Islands National Park visitor center in Ventura, Santa Rosa is the second largest island in California at approximately 53,000 acres in size. The island's relatively low profile is broken by a high, central mountain range, rising 1,589 feet at its highest point. Its coastal areas are variable, ranging from broad, sandy beaches gently sloping toward a dynamic ocean to sheer cliffs plunging toward the turmoil of a sea intent on changing the contour of the land.

As on its larger neighbor, Santa Cruz Island, these varied landforms support a diverse array of plant and animal species. About 500 plant species can be found within nine plant communities, including six plant species found only on Santa Rosa and nowhere else in the world. One of these species, the Santa Rosa Island subspecies of Torrey pine, is considered one of the rarest pines in the world—the last enduring members of a once widespread Pleistocene forest. A remnant, mainland subspecies of Torrey pine also can be found near La Jolla, California, at Torrey Pines State Reserve. Santa Rosa Island also hosts over 100 bird and three mammal species (including the island's largest native mammal, the endemic island fox); two amphibian and three reptile species; and colonies of seabirds, seals, and sea lions.

Remains of an ancient endemic species, the pygmy mammoth, have been uncovered on Santa Rosa, along with Santa Cruz and San Miguel Islands. These miniature mammoths, only four to six feet tall, once roamed island grasslands and forests during the Pleistocene. The fossil skeleton discovered on Santa Rosa Island in 1994 is the most complete specimen ever found.

Along with extensive paleontological resources, Santa Rosa Island has rich archeological resources. Home to the Island Chumash until approximately 1820, Wima (as the Chumash refer to the island) contains thousands of significant and federally protected archeological sites. Archeological investigations on the island have enabled scientists to construct a more complete picture of Chumash life on the islands. Radiocarbon dating on some of these sites indicates that humans have been using the island for more than 13,000 years.

Others have come to the island during more recent centuries to exploit its rich resources, sometimes making it their home. In addition to the native Chumash, European explorers, Aleut sea otter hunters, Chinese abalone fishermen, Spanish missionaries, Mexican and American ranchers, and the US military all have left their mark on the Santa Rosa landscape. Visitors can see relics of these occupations in remnants of fishing camps, water troughs and fence lines, the pier where cattle were loaded and unloaded, buildings and equipment of the historic Vail and Vickers ranch at Bechers Bay, and remains of the military installations.

Surrounding the island are cold, nutrient- rich waters that sustain a diverse web of marine life, including pelagic fish, a variety of marine mammals, and extensive kelp forests.

As on the other islands, the National Park Service has made great efforts to preserve and protect these island resources, including enforcement of marine protected areas, stabilization of cultural sites, rehabilitation of historic buildings, removal of nonnative plants and animals, recovery of island foxes, and reestablishment of bald eagles.

More Facts about Santa Rosa Island from NPS.gov

- ❖ Located in Santa Barbara County.
- ❖ Forty miles from Ventura; 26.5 miles from the nearest mainland; three miles east of San Miguel Island and six miles west of Santa Cruz Island.
- ❖ Santa Rosa is the second largest island in California. Approximately 15 miles wide by 10 miles long; 84 square miles; 53,000 acres.
- ❖ Average rainfall-15 inches.
- ❖ Radar Mountain is island's tallest peak at 1,589 ft.
- ❖ Six endemic plant species occur only on Santa Rosa Island.
- ❖ Santa Rosa Island is home to only three native terrestrial mammals-the island fox, island spotted skunk, and island deer mouse. They are all endemic to the Channel Islands.
- ❖ Reptiles and amphibians include the alligator lizard, Baja California tree frog, and three endemic species-the island gopher snake, island fence lizard, and Channel Islands slender salamander.

Name:	Date:
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SCIENTIFIC AND TECHNICAL VOCABULARY Santa Rosa

Scientific and technical terms are words with specific meanings to make writing about science and technology clear and precise.

DIRECTIONS: Write a definition for each scientific or technical term. Use a dictionary to help you. Next, write an original sentence using the vocabulary word. Try to use context clues that demonstrate the meaning of the word.

Term	Definition	ORIGINAL SENTENCE
inception		
nautical		
endemic		
radiocarbon dating		
paleontological		
archeological		
pelagic		

Ancient Bones May Rewrite History

From www.sbnature.org

John R. Johnson, Ph.D.

Curator of Anthropology, Santa Barbara Museum of Natural History

One of the outstanding discoveries made by Phil C. Orr during more than three decades of work as Curator of Anthropology and Paleontology at the Santa Barbara Museum of Natural History was his 1959 find of three ancient human bones found buried 30 feet deep in the side wall of Arlington Canyon on Santa Rosa Island. Orr immediately recognized the importance of his find and convened a committee of renowned archaeologists to verify the stratigraphic context of the bones. Charcoal from the same stratum that contained the bones was dated to 10,000 years before present, making the skeletal remains the oldest found in North America until that time. Orr called his discovery "Arlington Springs Man."

In the years since Orr's discovery, doubt was cast on the validity of the old dates because the bones were found in an eroded stream channel and the possibility remained that they were younger than the charcoal. With foresight toward the future when improved radiocarbon-dating techniques would become available, Orr removed a block of earth that contained the bones, wrapped it in plaster, and placed it in Museum storage.

In 1989, Dr. John Johnson, Curator of Anthropology, and Don Morris, Channel Islands National Park archaeologist, initiated a project to re-evaluate the age of the Arlington Springs remains. Johnson and Chumash research assistant Gilbert Unzueta excavated a portion of femur from the block of earth and sent samples to several specialists in bone chemistry analysis and radiocarbon dating.

The result of this research demonstrated that the bones appear to be older than Orr expected, dating to approximately 13,000 years ago. During the end of the Pleistocene, when Arlington Springs Man lived, the sea level was at least 150 feet lower than it is today and the Northern Channel Islands were joined as one island. This individual's presence on an island at this early date is significant, because it demonstrates that the earliest Paleo-Indians had watercraft necessary to cross the Santa Barbara Channel.

The newly-established age of the Arlington Springs Man lends credence to the coastal migration theory that ancient peoples first entered North America by boat down the Pacific Coast from Alaska. Modern testing supports Orr's notion that this ancient man represents the oldest human yet discovered in North America.

Arlington Man from NPS.gov

Dr. John R. Johnson, Curator of Anthropology at the Santa Barbara Museum of Natural History, wrote the following. Johnson's career has been devoted to understanding the culture and history of the Chumash Indians and their neighbors in south central California through the study of archeology, archival records, and interviews with contemporary Native Americans. Most recently, Dr. Johnson has headed the team that has been investigating the earliest evidence for people in our region at the Arlington Springs Site on Santa Rosa Island.



Archeologists excavate at Arlington Springs on Santa Rosa Island.

Arlington Springs: The Earliest Evidence for Paleoindians in Coastal California

Arlington Springs Man broke into the news following the Fifth California Islands Symposium held at the Santa Barbara Museum of Natural History in 1999. Newspapers, magazines, television news, and radio programs around the world reported on what are arguably the earliest dated human remains in either North or South America. Using a small fragment of a human femur discovered by Phil Orr in 1959 on Santa Rosa Island, modern techniques of bone protein analysis and radiocarbon dating indicate that Arlington Springs Man lived some 13,000 (calendar) years ago. Only one other find in North America, a child burial from the now-destroyed Anzick Site in Montana has ever been dated to this early age.

Arlington Springs Man lived at the end of the Pleistocene when the four northern Channel Islands were all still united together as one mega-island, and the climate was much cooler than today. The evidence that people had arrived on that island by 13,000 years ago demonstrates that watercraft were in use along the California coast at that early date and lends support for a theory that the earliest peoples to enter the Western Hemisphere may have migrated along the Pacific coast from Siberia and Alaska using boats. Recent radiocarbon dating by Dr. Larry Agenbroad of pygmy mammoth fossils from Santa Rosa Island suggests that the last of these unique mammals may have been present on the island at the time the first humans arrived.

An interdisciplinary team of archaeologists and geologists has been investigating the Arlington Springs locality over the past twelve years. In 2001 detailed studies were conducted to date the geological layers at the site and collect information regarding the late Pleistocene environment on Santa Rosa Island. New technologies, such as laser mapping and ground penetrating radar have been used to document the site and gather additional information to guide future research. During the most recent field season, a series of soil cores were obtained that will yield invaluable information about the geological and environmental history of the island.

- A. The modern northern Channel Islands
- B. The geography of the islands at various times in the recent past. From Collins (2009).

