

The Whole Kit and Kaboodle:



***Exploring the
Relationship
Between Land
Otters, Tlingit
People, and
Kit'n'Kaboodle Site***

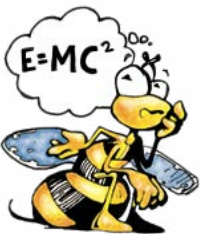
Meet the Scientist

► **Madonna Moss**, Anthropological Archaeologist: One of my favorite science experiences was when I worked at the archaeological site of Nunalleq in 2015. At Nunalleq, wood **artifact** preservation is fantastic. As I was digging, I found what looked like a toy kayak, but when I rotated it, I saw a deeply **incised** face. Rotating it again, I could see the face of a walrus. It was described by a Quinhagak elder as a spirit figure and combined the three images into one carving.



What Kind of Scientist Did This Research?

anthropological (an(t) thrə pə lä ji kəl)
archaeologist (är kē ä lä jist): This scientist studies the ancient and recent human past through material remains. Material remains are things left behind like bones, ceramics, shells, and other artifacts.

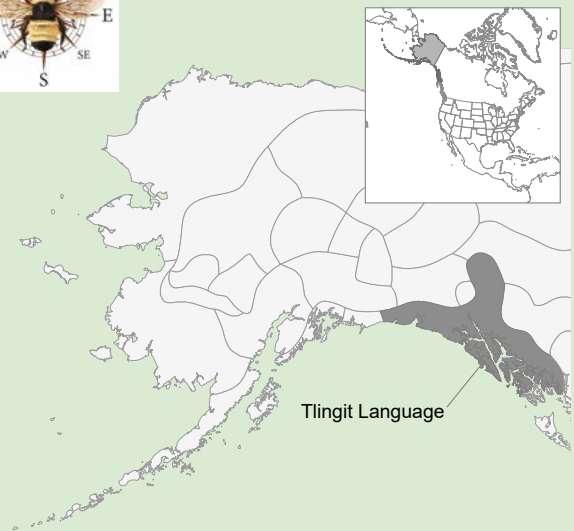


Thinking About Science

The world of science is made up of many different disciplines. In this research, the scientist is an anthropological archaeologist. Anthropology is the study of human cultures or learned behavior patterns of humans. Archaeology is the study of the ancient and recent human past through items that have been left behind. Archaeology is a part of the larger field of anthropology. In

Did You Know?

Tlingit is the language of coastal Southeastern Alaska from Yakutat south to Ketchikan. The total Tlingit population in Alaska is about 10,000 people, who live in 16 communities. Approximately 500 of these people speak the Tlingit language.



Glossary words are **bold** and are defined on page 43.

this research, the scientist studied the long-term history of Native Americans and First Nations of the Northwest Coast of North America, with a special focus on Tlingit (**tlɪŋ kət**) people. The Tlingit people lived along the Pacific Northwest coast and are an **indigenous** tribe of Alaska.

Because science incorporates many diverse research areas, many new and interesting ways are used to examine something. In this research, the scientist applied her knowledge of Tlingit people, anthropology, archaeology, and animals to a cave that was discovered in southeast Alaska.

Thinking About the Environment

Caves are a unique formation that are often found in karst landscapes. Karst is a **geochemical** landform from which caves and **sinkholes** are formed (**figure 1**). Karst is made up of limestone and other **soluble** rocks. Limestone erodes easily, especially when groundwater or rainfall is slightly **acidic**. As limestone erodes, water seeps into the ground and further erodes the limestone underneath. This erosion forms caves as well as other features such as sinkholes and underground streams (**figure 2a-2d**).

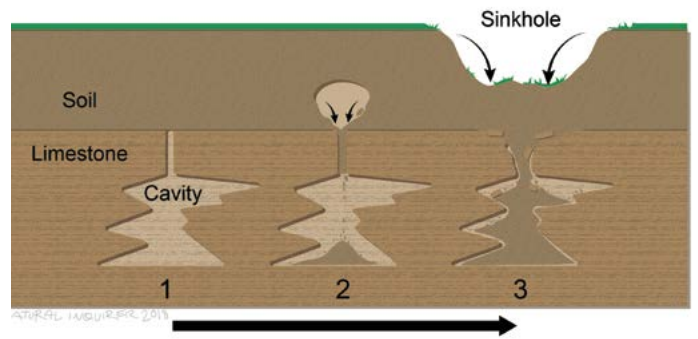


Figure 1. Sinkholes are large depressions in the ground. They are often found in karst areas where underground areas made of limestone and other soluble rocks are eroded away. Illustration by Stephanie Pfeiffer.

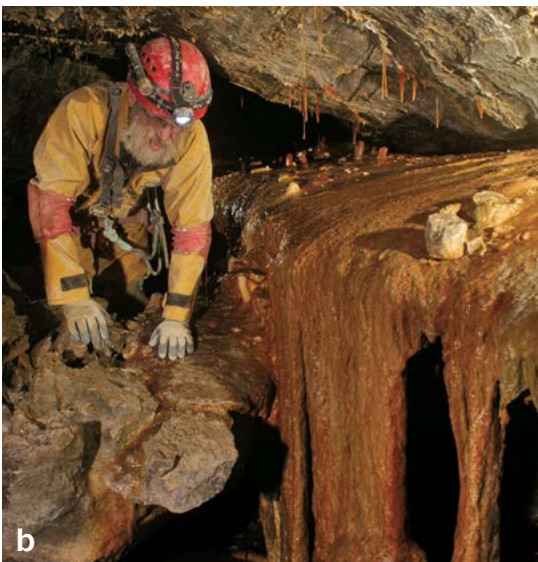
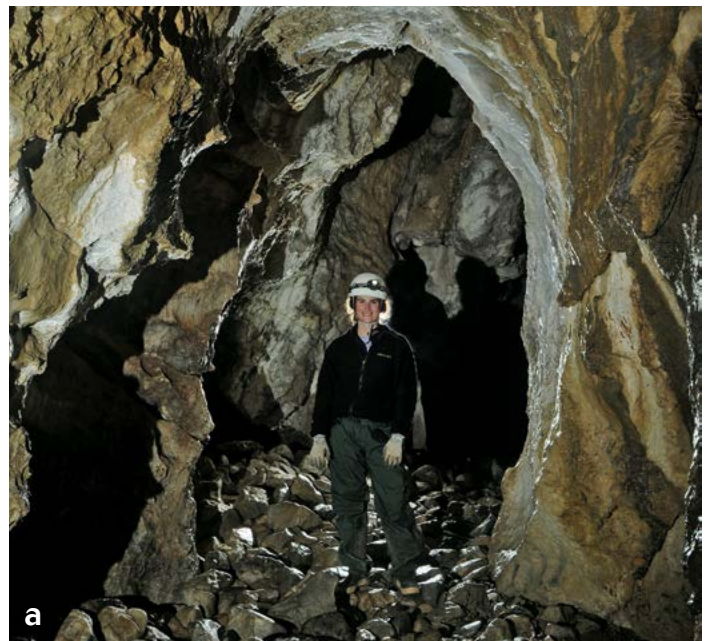


Figure 2a-2c. Caves have many unique features. Photos courtesy of Dave Bunnell, Under Earth Images.



Figure 2d. Caves have many unique features. Photo courtesy of Dave Bunnell, Under Earth Images.

In this study, the scientist was interested in a particular site, called Kit'n'Kaboodle, located on Western Dall Island in the Alexander Archipelago (**är kə pe lə gō**) (**figure 3**). An archipelago is a group of islands. The cave is located in the Tongass National Forest and protected under Federal laws (**figure 4**).

Kit'n'Kaboodle Cave was discovered in 1992 by a team from the USDA Forest Service. This cave and others in this area contain remains that interest many different types of scientists. For example, **paleontologists**, biologists, and archaeologists all have interest in the remains left in these caves. Since 1993, the Tongass National Forest has supported **interdisciplinary** research to document the caves and the resources they contain.

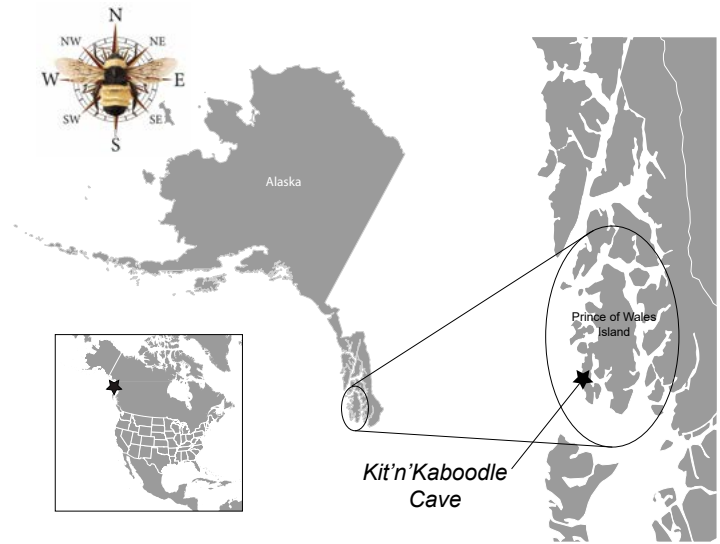


Figure 3. Kit'n'Kaboodle Cave is in the Alexander Archipelago. Map by Carey Burda and Stephanie Pfeiffer.

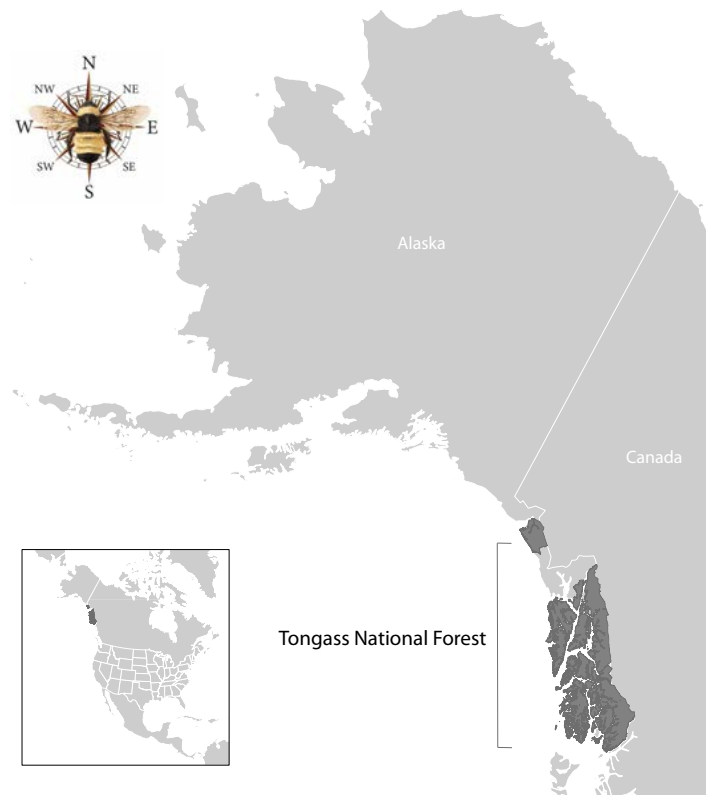


Figure 4. Tongass National Forest is in Alaska and encompasses Kit'n'Kaboodle Cave. Map by Carey Burda and Stephanie Pfeiffer.



Figure 5. North American river otter is a member of the weasel family. The Tlingit people called this animal a land otter. Photo courtesy of stephanjezek, istockphoto.com.

Introduction

The Tlingit people have many stories and beliefs about the land otter. The land otter, also known as the North American river otter, is a member of the weasel family (**figure 5**). Traditionally, the Tlingit people believed that all animals had souls and were once people. They believed that land otters had **supernatural** power. Some Tlingit people believed that land otters could transform into

people, and people could transform into land otters. The land otters were deeply respected and feared. The Tlingit people primarily avoided the land otter. However, the spiritual leaders of the Tribe, **shamans**, sought out the land otters. The land otter was a strong spirit helper for the shaman.

The scientist in this study was interested in learning about whether the Kit'n'Kaboodle site was occupied by land otters at times when people were not present. The scientist also wanted to know if the shells and animal bones left by people differ from the shells and animal bones left by land otters. Additionally, the scientist studied whether land otter behavior affected the beliefs of Tlingit people about the land otter.

Reflection Section

- All people have stories and traditions that are passed down from generation to generation. What is one story or tradition that has been passed down in your family?
- State in your own words what the scientist was interested in learning.



Method

The Kit'n'Kaboodle site is located at the head of Gold Harbor. Gold Harbor is a bay on Dall Island that is largely sheltered from the heavy storms and surf that are present on the outer coast of the island. The cave has at least four entrances. Three of these entrances show evidence of humans having lived there, including the remains of large fish like halibut or salmon, larger mammals, and bird remains (**figure 6**).

During 3 field trips to the cave in 1994, 1996, and 1998, the scientist and her team collected 11 samples from 3 different areas in the site. The samples were about 1 gallon in size and contained shells, bones, and other material. These samples were taken to a lab for analysis.

A total of 5,035 bones were analyzed. The scientist identified which bones belonged to which animal. Living things are classified in the following way: Kingdom - Phylum - Class - Order - Family - Genus - Species (**figure 7**). For some of the bones, the scientist could



Figure 6. Salmon are found in many places in the Pacific Northwest. Photo courtesy of U.S. Fish and Wildlife Service.

make identifications to the genus or species level. She counted, weighed, and noted the age and any damage or modification to the bones. The scientist and her team took fine **sediment** and sifted it over fine-mesh screens. From this, they gathered small bones to be identified.








Kingdom	Animalia	Animalia	Animalia	Animalia	Animalia	Animalia	Animalia
Phylum		Chordata	Chordata	Chordata	Chordata	Chordata	Chordata
Class			Mammalia	Mammalia	Mammalia	Mammalia	Mammalia
Order				Carnivora	Carnivora	Carnivora	Carnivora
Family					Canidae	Canidae	Canidae
Genus						Canis	Canis
Species							familiaris
							
	Butterfly	Fish	Elephant	Lion	Fox	Wolf	Dog

Figure 7. Examine the way living things are classified. What is the genus and species for a dog? Illustration by Stephanie Pfeiffer.



Figure 8. Steep, vegetated shorelines provide areas for land otters to hide from predators. Photo courtesy of U.S. Forest Service Pacific Northwest Region, via Flickr.

The team also observed land otter **scat**, remains of fish and birds, mussel shells, and physical evidence for the presence of land otters. The scientist knew that land otters like to be in areas that have steep, vegetated shorelines (**figure 8**). Land otters like to be close to water but minimize exposure to predators by hiding in steep

vegetated shoreline areas. In terms of food, land otters in this area ate fish and mussels (**figure 9**).

Since 1978, the scientist has worked with Tlingit people in Southeast Alaska. They taught her a lot about Tlingit culture, but she also studied many books and research papers about this culture. Additionally, the scientist learned from her colleagues who are also students of Tlingit culture.

Reflection Section

- Material was collected from three different areas of the site. Why do you think it was important for the scientist to collect information from multiple locations?
- Think about the last time you did research on a specific topic at school. Did you use books, the Internet, information from teachers to learn about the topic, or another method? If so, what method of gathering information did you find most useful? Why?



Findings

Out of the 5,035 bones, the scientists identified bones from 71 **vertebrate taxa** including 44 fish, 18 birds, and 9 mammals. The bones were identified to the family, genus, or species level. From the samples, the most commonly identified animals were rockfish and Sitka black-tailed deer (**figure 10**). However, harbor seal, sea otter, black bear, Pacific cod, lingcod, halibut, tufted puffin, common murre, and **pelagic** cormorant were also identified (**figures 11 a-d**). Some of these remains, such as halibut and harbor seal, would have been from humans using the cave as a shelter. Some of the smaller fish that occupy tidepools in the



Figure 9. Mussels are a common source of food for land otters. Photo courtesy of Dr. Andrew Rypel.



Figure 10. Sitka-black tailed deer are found in coastal rainforests of southeast Alaska and north coastal British Columbia. Photo courtesy of Tongass National Forest, MacDougall.



Figure 11a. Pelagic cormorant is a bird that is found along shorelines. The bird prefers inland shorelines as opposed to open water areas. Photo courtesy of U.S. Fish and Wildlife Service, via Flickr.



Figure 11b. A Common Murre is a bird that is found near oceans. This bird's diet largely consists of fish and small marine invertebrates. Photo courtesy of U.S. Fish and Wildlife Service, Lowe, via Flickr.



Figure 11c. Lingcod is found only off the west coast of North America. Photo courtesy of Eduardo Baena, istockphoto.com.



Figure 11d. Harbor seals spend half their time in water and half their time on land. Photo courtesy of U.S. Fish and Wildlife Service, Lowe, via Flickr.

intertidal zone were only found in the areas with evidence of land otters.

The team found evidence of land otters at the site. The scat had broken down over time leaving mostly bones and shell fragments that the animal could not digest. They found scattered fish and bird bones as well as pieces of mussel shells. The scientists also noted the physical characteristics of the area surrounding the site. Steep vegetated slopes and **overstory** vegetation were found near the cave. Land otters would prefer the area because there were places to hide from predators, but still be close to the water.

Discussion

The scientist and her team found evidence of both humans and land otters at the Kit'n'Kaboodle site. Based on what the team found at the site and the information gathered about the Tlingit people and land otters, the scientist made some **inferences**. The scientist inferred that the Tlingit people's beliefs about the land otter may in part be due to the fact that the Tlingit people and the land otter shared the same living space, although occupied the space at different times. The Tlingit people developed a lot of knowledge of land otter behavior and activities. This knowledge helped form some of the Tlingit ideas and beliefs surrounding the land otter.

Reflection Section

- In the first paragraph of the Findings section, the last sentence states "Some of these remains would have been due to humans using the cave as a shelter." What remains do you think would indicate the presence of humans? Why?
- Observation is an important characteristic of a scientist. Why was observation important in this study?
- Think of a time that you closely observed something. What did you learn that surprised you?



Reflection Section

- The scientist in this study is an anthropological archaeologist. After having read about the study and what the scientist did, what things did you notice that support the fact that the scientist is an anthropological archaeologist?
- The scientist inferred that sharing space helped the Tlingit people understand land otters better and contributed to the land otter's presence in Tlingit stories and beliefs. Think about a person or animal you share space with, like a cat, dog, or family member. Do you think by sharing common space with this animal or person, even though you may not be in the space at the same time, helps you to understand the person or animal better? What are some examples?



Glossary

acidic (a si dik): Containing acid.

artifact (är ti fakt): An object made by a human being, typically an item of cultural or historical interest.

geochemical (jē ō ke mi kəl): Having to do with the chemical composition of and chemical changes in the solid matter of the earth or a celestial body (such as the moon).

incised (in sīzd): Cut in or engraved.

indigenous (in di jə nəs): Living naturally in a particular region or environment.

inference (in f(ə-)rən(t)s): A conclusion or opinion that is formed because of known facts or evidence.

interdisciplinary (in tər di sə plə ner ē): Involving two or more academic, scientific, or artistic disciplines.

overstory (ō vər stōr ē): The layer of leaves in a forest canopy.

paleontologist (pā lē än tā lə jist): A scientist who studies the life of past geological periods as known from fossil remains.

pelagic (pə la jik): Relating to the open sea.

scat (skat): An animal fecal dropping.

sediment (se də mənt): Material deposited by water, wind, or glaciers.

shaman (shä mən): Someone who is believed in some cultures to be able to use magic to cure people who are sick, to control future events, etc.

sinkhole (sɪŋk hōl): A hollow in a limestone region that is related to a cave or underground passage.

soluble (säl yə bəl): Capable of being dissolved in or as if in a liquid, especially water.

supernatural (sü pər na chə rəl): Something attributed to some force beyond scientific understanding or the laws of nature.

taxa (tak sə): The name applied to a taxonomic group in a formal system of naming.

vertebrate (vər tə brət): An animal that has a backbone.

*Accented syllables are in **bold**. Marks and definitions are from <http://www.merriam-webster.com>.*

Definitions are limited to the word's meaning in the article.

Adapted from Moss, M. 2015. An Ethnozoarchaeological Study of Land Otters and People at Kit'n'Kaboodle (49-DIX-46), Dall Island, Alaska. B.C. Studies 187: 21-51.



Note: This FACTivity was adapted from the National Park Service Junior Ranger/Junior Archeologist book. For more information, visit <https://www.nps.gov/kids/pdf/jrarcheologistandparentguide.pdf>.



Time Needed

2 class periods

Materials

(for each student or group of students)

- A container for time capsule materials
- Blank paper
- Time Capsule Graphic Organizer
- Writing utensil

In this FACTivity, you will think about how you live and what artifacts you would like an archeologist to find one day to help explain the time period you live in now.

Methods

1. Your teacher will put you in pairs or small groups. Once you have been divided up, your pair or group needs to brainstorm a list of items you could put in a time capsule. Your pair or group will need to imagine that

an archeologist would find this time capsule 200 years from now. Think about what items would best help the archeologist to understand how you live now and what your culture is about. You also need to think about what kind of materials may be able to last for 200 years in a time capsule. Your teacher will give you 20-25 minutes to brainstorm a list.

2. After the brainstorming is complete, your pair or group will need to narrow down the list to only five items. After you choose the five items, complete the Time Capsule Graphic Organizer. You will share the information in the graphic organizer with your class during the next class.
3. During the next class period, your pair or group will share with the class the five items they chose and why. Your teacher will keep a list on chart paper or the board, so everyone can see what items have been proposed.
4. Once all pairs or groups have shared, your teacher will have each student vote for their top five items from the class list. Once your teacher tallies the votes, your teacher will share them with the class.
5. As a concluding activity, the class can create one time capsule with the five items identified.



If you are a trained Project Learning Tree educator, you may use "People of the Forest," "Tale of the Sun," "Environmental Exchange Box," "Tipi Talk," "The Native Way," and "A Look At Lifestyles" as additional resources.

Web Resources

Tlingit – Alaska Native Language Center
<https://www.uaf.edu/anlc/languages/tl/>

Tlingit – Smithsonian National Museum of Natural History
<https://naturalhistory.si.edu/Arctic/features/croads/tlingit.html#tlingit>

Indigenous People and Languages of Alaska – Alaska Native Language Center
<http://www.uaf.edu/anla/collections/map/anlmap.png>

Kit 'n' Kaboodle Cave
<http://apps.usd.edu/esci/alaska/kitkab.html>



Name: _____



Time Capsule Graphic Organizer

Item Chosen	Why?