

Kids Archaeology & Cookie Excavating

Grades K-5th

Fort Selden Historic Site



Essential Question

What is an archaeologist?

This lesson will introduce students to the topic of archaeology. It will provide you and your students with an overview of what an archaeologist does and provide students the opportunity to do their own archaeology work at home in a fun and delicious way by making and using homemade cookies.

Objectives

After completing this lesson, student will be able to:

1. Define what an archaeologist is.
2. Identify what tools archaeologists use.
3. Explain the types of objects archaeologists dig for.
4. Understand how an archaeologist completes an excavation and survey.

Background

Information Courtesy of the Society of American Archaeology and the City of Alexandria, Virginia

Humans are curious, questioning, and inquisitive. We study our collective pasts to gain a better understanding of who we are now and who we are going to be in the future. By studying the past, we learn how and why people lived as they did throughout the world. We learn about changes over time and the causes of those changes.

The field of archaeology offers a unique perspective on human culture. It helps us understand not only where and when people lived on earth, but also how they lived. Archaeologists analyze the things people made and left behind—the study of the ancient and recent human past through material remains. Archaeologists might study the million-year-old fossils of our earliest human ancestors in Africa. Or they might study 20th-century buildings in present-day New York City. History, on the other hand, relies on written records and documents to interpret great lives and events.

It is a diverse field of study. Most archaeologists focus on a particular region of the world or a specific topic of study. Some archaeologists study human remains (bioarchaeology), animals (zooarchaeology), ancient plants (paleoethnobotany), stone tools (lithics), etc. Some archaeologists specialize in technologies that find, map, or analyze archaeological sites. Underwater archaeologists study the remains of human activity that lie beneath the surface of water or on coasts. Cultural Resource Management—known as CRM—refers to the work archaeologists do to follow federal and state laws.

It should be understood that scientists who study dinosaur bones—or animal and plant fossils—are paleontologists. Paleontology is the study of the history of life on Earth as based on fossils. That includes dinosaurs, other ancient animals, plants, and even bacteria. Paleontologists have a lot in common with archaeologists. Both excavate and study physical remains. The main difference is that archaeologists study the human past. Some archaeologists study animals or plants too, looking at the relationship that people had with them in the past.

Artifacts, the objects past people left behind, help archaeologists answer questions or explain problems. Sometimes they do this without digging at all! Archaeologists can use technologies such as satellite imagery or ground penetrating radar to learn about what is under the ground without digging. Other times they may be able to infer what is under the ground based on objects found on the ground's surface. Archaeologists may also analyze previously excavated collections that are stored in museums and laboratories. Whenever archaeologists do need to dig, they must follow strict legal and ethical guidelines. They are responsible for analyzing and storing the artifacts they recover, as well as sharing their discoveries with colleagues and the public.

Artifacts are important sources of information for archaeologists. Artifacts can tell us about the diet, tools, weapons, dress, and living structures of people who made and used them. Archaeologists wash, sort, catalog, and store recovered artifacts after bringing them back from the field. They analyze individual artifacts, but also may sort them into groups to see patterns. The locations of artifacts on a site provide clues to the kinds of activities that occurred. The type of material an artifact is made of is another important piece of information. It that can inform whether past people obtained the materials locally or by trading with another group. Artifacts provide a window into the lives of peoples who lived before.

A feature represents human activity but, unlike most artifacts, it cannot be removed from the archaeological site. A feature might be a stain in the soil that is evidence of a former fence post. Photographs, drawings, and soil samples of the fence post collected by the archaeologist are part of the scientific record of that feature. Those documents and samples are just as important as the artifacts found nearby. Features like soil stains can reveal the outlines of prehistoric or historic structures such as houses, barns, longhouses, and earthen lodges. Other types of features include fire pits, storage pits, and

middens—what archaeologists call garbage dumps! Outhouses are important features in historical archaeology sites, because people used to dump their garbage into them. Ecofacts are natural remains related to human activity. Plant and animal remains can help archaeologists understand diet and subsistence patterns.

An archaeological site is any place where there are physical remains of past human activities. There are many types of archaeological sites. Prehistoric archaeological sites are those without written record. They may include villages or cities, stone quarries, rock art, ancient cemeteries, campsites, and megalithic stone monuments. A site can be as small as a pile of chipped stone tools left by a prehistoric hunter or as large and complex as the prehistoric settlements of Chaco Canyon in the American Southwest. Historical archaeology sites are those where archaeologists can use writing to aid their research. Those could include densely populated modern cities, shipwrecks, battlefields, slave quarters, cemeteries, mills, and factories. Even the smallest archaeological site may contain a wealth of important information. (See Resource File “What Do Archaeologists Find”)

Context in archaeology refers to the relationship that artifacts have to each other and their surroundings. Every artifact found on an archaeological site has a defined location. Archaeologists record the exact spot where they find an artifact before removing it from that location. When people remove an artifact without recording its precise location, we lose that context forever. At that point, the artifact has little or no scientific value. Context is what allows archaeologists to understand the relationship between artifacts and archaeological sites.

There are many different tools archaeologists use to go about doing their jobs. You may think of shovels when you think of digging, but possibly the most important piece of equipment in the archaeologist’s toolkit is the trowel. Archaeologists use trowels to scrape away thin layers of soil from test units, or holes in the ground. Of course, archaeologists use many other tools in the field and lab. They need equipment to dig, sift, measure, and analyze artifacts. Some, like Scanning Electron Microscopes (SEM) are very specialized. Others, like tape measures, toothbrushes, and dustpans, are everyday objects! (See Resource File “Tools of An Archaeologist”)

Archaeologists use different methods to find sites—surveying the ground, using satellites, or sometimes by accident! An archaeological predictive model is a tool that indicates the probability that an archaeological site exists in a certain area. It helps determine where archaeologists look for sites based on factors like distance from water, ground steepness, soil type, and other factors that influence where people settle or perform certain tasks.

A surface survey is a systematic examination of the land. A team of archaeologists will walk in straight lines back and forth across the study area. As they walk, they look for evidence of past human activity, including walls or foundations, artifacts, or color changes in the soil that may indicate features. They will use a compass and long tape measure to make sure they walk in a straight line and will record the exact location of all evidence they find. They collect any artifacts and put them in bags with a label of its exact location. Features on the surface, which they cannot remove, are photographed and drawn.

Shovel test pits are a series of narrow holes dug in an area that archaeologists believe to be a potential site, revealing artifacts or features. Archaeologists usually dig test pits where the ground has not been farmed or plowed and it contains a lot of surface vegetation. They may screen—sift—the soil to recover small artifacts.

Archaeologists have to make accurate maps of each site prior to excavation. They first draw a base map that indicates where the site is located. During the excavation, archaeologists add to the map to show which portions of the site were excavated and where features and artifacts were discovered. A datum point, or point of reference is established, and measurements are taken from that point.

A grid is established over the site with string held by large nails or stakes. This is the site survey. The grid is based on the cardinal points of a compass—north, south, east and west. Accurate measurements using the grid are taken using surveying equipment. The accurate map and grid are necessary to maintain artifact context. Each excavation unit—the square on the established grid—is identified by a set of coordinates and recorded on the survey map. Sometimes, only a few test squares within the site grid will be dug, while on other sites the entire area is excavated.

Stratigraphy is the study of the soil layers in an archaeological site. The effects of human and natural actions over a long period of time cause visible changes in the color and texture of the soil. The strata may have formed gradually by erosion, gardening activities and littering; or over a shorter period of time through activities such as construction, demolition, trash dumping, or land-filling.

Each stratum—an individual layer of soil and artifacts—is dug separately. Archaeologists start on the top layer and work their way down following the visible lines of each stratigraphic layer. The layers containing soil, structures, and artifacts from different time periods are identified by careful excavation techniques. The archaeologists look for artifacts and any changes in the color and texture of the soil. These changes may indicate the beginning of a new layer.

As each layer is dug, it is measured, recorded, and marked on the site map. Artifacts are then collected and placed in a bag marked with the grid coordinates and the layer number. This exact location where the artifacts are found—the square, layer, and feature—is called the provenience. Each provenience is assigned a unique record number, to help keep track of the artifacts and record the artifact's context.

Each layer represents a segment of time, much like a timeline. Usually the lowest layers are the earliest, although features such as wells, foundations, and post-holes may have been dug through earlier layers.

Archaeologists must be observant and aware of variables that may have occurred after the artifacts were deposited on the site. Seasonal weather changes, roots, worm and rodent activities can alter the placement or preservation of the artifacts. The very actions that can create a site, such as those noted above, may also affect the artifacts and features at a later time.

After conducting a survey, archaeologists will have enough information to determine if any significant archaeological sites are in the study area. They may or may not find a site. Or, the sites may or may not be "significant" as defined by the law in the National Historic Preservation Act. Regardless, the archaeologist will write and file a site report with the State Historic Preservation Office, which describes their research. If they found significant sites, they might plan further excavations.

Believe it or not archaeologists rarely excavate—dig—entire sites! Archaeology is a destructive science—meaning that once a site is excavated, it is gone forever. The artifacts and information gathered remain, but the site itself can never be recreated. Excavating sites is also costly and time-consuming. Once the dig is done, archaeologists have a professional responsibility to analyze all the artifacts and information obtained, to report on their research, and to curate the collections. For these reasons, archaeologists generally excavate only when there is a threat of destruction or when they may reveal vital information about past cultures. And they usually excavate only a small part of any site.

Archaeologists spend much more of their time in the laboratory analyzing artifacts and data than they do in the field. Archaeologists analyze artifacts, features, and other information recovered in the field to help answer their research questions. During the investigative process, they might seek to learn when people occupied the site, the purpose of the objects recovered, what the people ate, the kinds of structures they built, with whom they traded, and much more. They may also look at how the site they are analyzing relates to other sites. The analysis will depend on the archaeologist's research questions from the beginning of the project.

Archaeologists have both ethical and legal obligations to preserve all the data they collect for the benefit of future generations. This includes not just the artifacts recovered, but also the associated information and records. This includes soil samples, field notes, maps, photographs, drawings, and related historical documents. Archaeologists follow strict guidelines and procedures for cleaning, labeling, cataloguing, and storing objects.

In some cases, removing an artifact from where you found it is against the law—on public land like state and national parks or on tribal lands. Removing artifacts from these areas is a crime that is punishable by jail time and fines. Collecting artifacts on private property is not against the law if you have permission from the landowner. It is best to leave the artifact where you found it but record as much information as possible. Note its location and a description of the artifact. It is useful to draw or photograph the object and record its location on a map if possible. If you are visiting a state or national park, inform a park ranger or naturalist.

Many archaeological sites are unintentionally damaged by visitors who come to enjoy and learn from them. Following these site etiquette guidelines will help reduce damage to fragile sites and will help to save the past for the future. This includes information on what to do if you find an artifact at a public site. These guidelines were adapted from those developed by the U.S. Forest Service.

1. All of the things you see at a site are evidence of the lives of people who once lived there, so it is important that you do not move or disturb anything from the site.
2. If you find an artifact, you can examine it, draw it, or photograph it, but it is very important that you leave it where you found it. It is useful to record as much information as possible about the location and the description of the artifact.
3. Be careful not to step on artifacts or other features at archaeological sites (structures, mounds, ancient trash pits) unless there is the proper infrastructure (for example, boardwalks) in place that will prevent you from damaging these ancient features.
4. Don't lean, sit, stand, or climb on prehistoric walls.
5. Staying on established paths or trails will help control erosion and preserve the site.
6. Modern trash can contaminate the soil of an archaeological site so be sure not to toss an apple core, banana peel, or cigarette. Food can attract animals, which can be very destructive to sites.
7. Place your campsite away from archaeological sites. Campfires produce charcoal that can alter radiocarbon dates of an archaeological site, and food attracts animals that may dig, nest, or burrow on the site.
8. Pets can be very destructive to archaeological sites—leave your pooch behind when you are visiting a site.
9. Share the information with a professional archaeologist. If you are visiting a state or national park, inform a park ranger, naturalist, or interpreter. Each state has a Historic Preservation Office that records the location of archaeological sites.

Hands-On Activity & Resource Pages

What is an Archaeologist

Tools of an Archaeologist

What do Archaeologists Find?

Related Vocabulary

Bake cookies at home and cookie excavation

New Mexico Content Standards

<https://webnew.ped.state.nm.us/bureaus/instructional-materials/new-mexico-content-standards/>

K-4th Grade Standards

STRAND: History

Content Standard I: Students are able to identify important people and events in order to analyze significant patterns, relationships, themes, ideas, beliefs, and turning points in New Mexico, United States, and world history in order to understand the complexity of the human experience.

K-4 Benchmark I-D—Skills: Understand time passage and chronology.

STRAND: Geography

Content Standard II: Students understand how physical, natural, and cultural processes influence where people live, the ways in which people live, and how societies interact with one another and their environments.

K-4 Benchmark II-A—Understand the concept of location by using and constructing maps, globes, and other geographic tools to identify and derive information about people, places, and environments.

Additional Resources & Resources Used

“About Archaeology.” The Society for American Archaeology. <https://www.saa.org/about-archaeology>.

“Archaeology 101: Artifact Versus Feature.” MSU Campus Archaeology Program. Michigan State University. <http://campusarch.msu.edu/?p=1044>.

Haselgrove, Colin and Stefan Krmnicek. “The Archaeology of Money.” *Annual Review of Anthropology* Vol. 41 (October 2012): 235-250.

“Prehistoric Stone Tools: Categories and Terms.” ThoughtCo. <https://www.thoughtco.com/prehistoric-stone-tools-categories-and-terms-171497>.

“Selecting the Site.” Archaeological Process. City of Alexandria, Virginia.

<https://www.alexandriava.gov/historic/archaeology/default.aspx?id=33498#ExcavatingtheSite>.