

Archaeology Alive!

What is Archaeology?

*This slideshow developed by archaeologist Dr. Alexander Smith
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the Memorial Art Gallery (MAG) of the University of Rochester*

Note to Teachers:

The information in this script is provided for your background and context; please feel free to tailor the information according to your students' needs.

SLIDE 1

What is archaeology? What do you think of when you hear “archaeologist” or “archaeology?”

[Possible answers include references to digging, dinosaurs, fossils, old stuff, Indiana Jones, etc.]

Archaeology is a science of history, and archaeologists are scientists who study past cultures and human history through physical remains – through the “stuff” left by humans.

Many human beings who lived on this planet didn't write things down for us – we don't have any kind of written documents or books from early humans. So how can we know anything about these human beings: how they lived, where they lived, what kind of work they did, what kinds of objects they made and used? We can study the answers to these kinds of questions by using the physical remains and objects that these people left behind. Human-created objects such as tools, weapons, and works of art are known as **artifacts**, which archaeologists dig up and study along with the remains of ancient buildings and dwellings. They investigate and search for clues – much like detectives – to tell us:

how people in the past lived,
where they lived,
what their lives were like,
what kind of objects they made,
what they ate,

what kind of tools they had,
what kind of religious beliefs they had,
where they died,
how they were buried,
and more!

This slideshow will give you a chance to learn about how archaeologists actually go about studying the human past through objects.

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SLIDE 2

So what do archaeologists actually do?

Do they study dinosaurs? *[no, that the job of a paleontologist]* Archaeologists study the human past!

How do they find the artifacts that they study? Do these images offer any clues?

1. }
2. } archaeological excavations in progress

3: various kinds of tools used by archaeologists in excavations

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SLIDE 3

A large part of what archaeologists do is dig, or **excavate**. Excavation is hard and very dirty work. You have to like getting dirty to do archaeology! It is also physically very demanding – often it's like doing really hard yardwork! Archaeologists use many different kinds of tools. What tools do you recognize in these images?

1. This archaeologist uses a **shovel** to excavate a precise area that has been marked off by **tape**.
Precision is very important in archaeology – everything and every place must be very carefully noted, measured, and marked.
2. Two archaeologists use **large pickaxes** to dig a trench through dirt layers. ©
3. Jonathan is using a **broom** and **dustpan** to sweep dirt away and “clean up” an excavated layer at a site in the Caribbean. Notice the yellow **buckets** behind him: why do archaeologists use buckets?
[All dirt from a site during an excavation is removed in buckets, to be examined further.]
(More information on this in the next slide)
4. Alex uses a **small pickax** and variety of **brushes** at a dig site in Spain.
5. Claudia is using a **trowel** (the classic archaeology tool) and a dustpan to excavate a sanctuary site in Greece. ©

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SLIDE 4

What do you see these archaeologists doing? What tools are they using?

[Possible answers: brushing the dirt off objects, washing finds with toothbrushes, sifting, sorting through the dirt looking for small things]

Why worry about the small stuff? Why do archaeologists bother to spend time looking for tiny **fragments** and broken objects, when they could be concentrating on the large objects and architectural finds?

There are a number of reasons:

- Sometimes very tiny but whole objects, such as coins, beads, teeth, and bones, can be overlooked during the digging process.
- Broken objects can be reassembled during the **conservation** stage, so archaeologists want to find as many pieces as they can.
- Sometimes a very tiny object, or even just a fragment of an object, can have a lot of information to share about the site or the culture.
- Once archaeologists dig in a site, no one can excavate it again. It is essentially destroyed, but in a very careful, systematic, scientific way. Archaeologists want to be certain that they find every single object, down to the tiniest fragment. They make very precise records: write notes, measure, draw, photograph, and use GPS systems to record finds and locations.

Images information:

1. An archaeologist uses a **paintbrush** to delicately clear dirt from a fragile find.
(archaeological investigations at the old Champoeg townsite, Champoeg State Park, Oregon (USA), 1975.
<https://www.flickr.com/photos/qbaku/1543938114>)
2. **Toothbrushes** and water help an archaeologist to gently clean small fragments of pottery, bone, and other materials. (<http://pixabay.com/en/archaeology-digging-searching-59167/>)
3. A group of archaeologists uses **sieves** to screen the excavated dirt, looking for very small finds and fragments. These sometimes can be missed when you're moving a lot of dirt with large tools. ©
4. Larger, free-standing **sifting frames** like this one allow archaeologists to sort through a large amount of excavated dirt at a faster rate.
(A member of the Southwest Archaeology Team pours excavated matrix (site dirt layers) into a sifting frame. Photo from the 2011 Annual Open House at Mesa Grande, hosted by the Arizona Museum of Natural History, the Mesa Grande Neighborhood Alliance, and the Southwest Archaeology Team. This event is the one day each year that the Mesa Grande site is open to the public. (19 March 2011)
[http://commons.wikimedia.org/wiki/File:Mesa_Grande_2011-03-19_3859_\(cropped\).JPG](http://commons.wikimedia.org/wiki/File:Mesa_Grande_2011-03-19_3859_(cropped).JPG)

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SLIDE 5

How do archaeologists know where to excavate? They don't just start digging in the ground to find artifacts. Before they dig, most archaeologists will use a technique known as **survey**.

You may have taken a survey before, answering a series of questions to find out what you think or know about something. For archaeologists, survey involves "asking the landscape" the questions.

Pedestrian survey (*Image 2*) involves archaeologists walking around on the surface of the earth, looking for any evidence of archaeological material visible on the surface. They are looking for scattered bits of broken pottery, as well as parts of walls or other evidence of ancient structures. Over time, ancient sites and objects get buried (requiring excavation), but some objects and sites get "un-buried" as well – uncovered through wind and water erosion, and through human activity such as digging, plowing, and earth-moving. Archaeologists often find many small artifacts and fragments on the surface, and a number of them in certain areas can indicate a good place to begin an excavation.

Technology offers archaeologists very effective ways to explore and document the landscape. Have you ever seen a contraption like this one (*Image 1*) before? Maybe around construction sites or along the roadways? It looks a little bit like a camera, but it is a very sophisticated tool called a **total station**, which records the features of the landscape in very precise detail. The information gathered by the total station can be used to generate a computerized, 3D map of an area to help archaeologists analyze natural features as well as any man-made features.

Surveying the local residents of an area can sometimes also give archaeologists good leads to potential dig sites. Locals often know stories about who or what lived in the area long ago; even if they only consider the stories to be legends today, they just might reflect memories of older inhabitants.

Archaeologists can survey any place that people have lived, or where they still live. **Urban archaeology**, in cities, towns, and villages, is more difficult because of the modern structures like buildings, roads, sewers, parking lots, and electric lines. Many archaeologists choose to work in rural areas out in the deserts, pastures, fields, and mountains, where no one lives now (except maybe farm animals) and no one has looked for archaeological evidence before.

Images information:

1. Alex perches on a rocky hilltop in Jordan (Petra) with a **total station**, used to create a 3D digital map, a bit like the one pictured below. This map shows a site's **topographic context** (the landscape around it) as well as any architectural (man-made) features.
2. Part of Brown University's team conducts intensive **pedestrian survey** in the Jordan desert. They are walking across the landscape at spaced intervals, carefully looking for, collecting, counting, and recording all archaeological evidence visible on the surface of the earth.
3. Emanuela prepares to take survey **notes** in the desert wilderness of Petra, Jordan, surrounded by a herd of local goats. (The goats do not help in archaeological work, but instead will chew on and eat clothing, equipment, paper, and anything else.)

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SLIDE 6

Archaeologists don't only work on land! All of their work can be done underwater as well – the survey, and then eventually even excavation.

Do any of these images give you an idea of what underwater archaeologists look for? Or what kinds of tools they use?

Underwater archaeologists can go scuba diving, or send little robotic cameras down into the water to explore the sea floor. They especially look for the remains of shipwrecks or other archaeological artifacts that got preserved in the water on the sea floor. These can then be documented and mapped, and eventually excavated, just like on land (but it's all obviously much more difficult underwater, especially in really deep water!).

See the next slide for some answers!

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SLIDE 7

Images information:

1. Emanuela conducts underwater archaeological survey (note her clipboard, pencil, and measuring tape) in the Mediterranean Sea, off the north coast of the island of Menorca, in Spain.

Underwater archaeologists use a special, waterproof paper (a bit like waxed paper) and grease pencils to take notes underwater. Now there are even computers that work underwater!

2. Dianna, another member of the team, displays an artifact. It is the top of a broken Roman **amphora**, a pottery storage jar, possibly 2,000 years old. The complete amphora might have looked something like the one pictured to the right. How did a Roman pot get onto the sea floor?

*[Storage jars like this, called **transport amphorae**, came in a variety of body shapes, but all were large and strong. Loaded onto ships, they were used to transport foods like grains, wine, honey, olives, olive oil, and other goods all over the ancient Mediterranean region. If a ship hit rocks or got caught in a storm and sank, all the cargo sank to the bottom of the sea too, and usually smashed into pieces.]*

3. Two underwater archaeologists in scuba gear are measuring, drawing, and documenting a huge, 10- to 12-foot iron anchor on the seabed. How did an anchor get onto the bottom of the sea? The other image is a reproduction of an anchor type used by the ancient Romans.

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SLIDE 8

When archaeologists survey and/or dig, they make discoveries – they find stuff! That’s why they do it!

What kinds of things do archaeologists find? Do you recognize some of the artifacts here?

Finds can vary from human remains like teeth or bones (*Image 1*), shiny metal objects like **coins** (*Image 2*), and walls or other built structures. The most common find is **pottery**, or fired clay objects known as **ceramics** -- the remains of the vessels people used for cooking, eating, and storing foods.

Everything that archaeologists find has to be very carefully documented (drawn, photographed, described, its exact position recorded, etc.) before it can even be removed from the earth.

Images information:

1. Claudia excavates the **bones** of a human skeleton from a late Roman burial in Italy.

What other kinds of bones do archaeologists find? Why?

[animal bones – because humans hunted, and domesticated animals for food, labor, pets... what kinds of animals did human use, and still use today?]

2. An ancient Greek **coin** of Alexander the Great; from the Memorial Art Gallery’s collection. (2005.182)
Front = portrait of Alexander the Great; back = the God Zeus on a throne

What are coins made from? *[metal – what kind of metal?]*

[Of the “5 Big Metals” of the ancient world, four were used for coins: gold, silver, copper, and bronze. The fifth metal, iron, was used to make tools and other implements.]

3. These ceramic objects mostly represent different kinds of pots: bowls, vases, pitchers.

Are they usually found like this, all nice and complete?

[no, they are almost always shattered and broken – because archaeologists often excavate ancient trash heaps!! Looking through ancient people’s trash is a great way to learn how they lived.]

What is inside these bowls? How well do these things survive underground?

[foods, like grains and eggs – they don’t survive well at all. Imagine burying a sandwich outside. How long would it last?? Not very long!!]

4. Food and other organic materials -- like textiles (wool and cotton), wood, paper, and leather – rot and decay rather quickly, so rarely appear in archaeological excavations. It takes very special conditions to allow things like that to survive for archaeologists to find them: cut off from air and moisture, sealed off from molds and bacteria that cause them to decay. Those conditions are found in the sealed tombs of ancient Egyptians, and that enabled this over 5,000 year-old-loaf of bread, on display at the Memorial Art Gallery, to survive! (28.12)

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SLIDE 9

Once you've done the survey, made your map, and picked the site to excavate, you are ready to start digging. How do archaeologists excavate, and how do they date the things they find?

RIGHT IMAGE: illustrated example of stratigraphy

As archaeologists dig down through the earth, they pay very close attention to the layers of dirt through which they are excavating. The image on the right is a very simplified diagram: imagine standing on the grass, under the highway at the surface of the earth, and you start to dig a hole down into the earth. As you dig down, you pass through the most recent layers first. These tend to be darker in color and richer, from moisture, decaying plants, and other organic materials; this is the layers used for gardening and farming. The deeper you dig, the older and drier the layers become, and any artifacts there are older as well.

Think about it this way – if your laundry basket at home is full, which clothes were put into the basket first?

[the ones at the bottom of the basket! And the ones at the top were put there last! It's the same thing with layers of dirt – the oldest layers, and the oldest artifacts, are at the very bottom, and the layers and artifacts get younger and younger – more recent – as you go up.]

This whole business of using layers of earth in order to date things is called **stratigraphy**: the study of layers in the dirt. Some objects are known to be older or younger than others based on what layers the artifacts are in, and how deep the layers are often indicates how much time has gone by.

LEFT IMAGE: This Roman water channel, excavated by Brown University's team in the city center of Petra, Jordan, shows a real-life view of stratigraphy. Which layer is the oldest layer? Which is the youngest? Why?

[Over time, this water channel became filled in with dirt and trash. The first layer of fill, at the bottom, is the oldest dirt, and has the oldest artifacts in it. On top of that came another layer, which is a bit younger; then another layer on top of that which is even younger; and so on, until you reach Layer 1 at the top. By this time, the entire channel has been filled in, and is even with the surface.]

[End of the Slideshow]

SLIDE 10

- Images and Slides originally modified by Alexander Smith from the "Think Like an Archaeologist" Program of Providence, Rhode Island, created by:
 - The Haffenreffer Museum of Anthropology <http://www.brown.edu/research/facilities/haffenreffer-museum/>
 - The Joukowsky Institute for Archaeology and the Ancient World (Brown University) http://www.brown.edu/Departments/Joukowsky_Institute/
 - The Rhode Island School of Design Museum <http://risdmuseum.org/>
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- Additional modifications made by staff from the Education Department at the [Memorial Art Gallery](#) of the University of Rochester, for the ["Alex the Archaeologist"](#) school visit program (2012-2015).

Glossary

amphora: (*AM-for-ah*) an ancient two-handled storage jar, made out of clay

archaeology: (*ahr-kee-AH-loh-gee*) the study of ancient human life and culture

artifact: (*AHR-tih-fakt*) an object created or modified by humans

ceramic: (*sir-AM-ik*) clay that has been fired (baked) at very high temperatures, or objects made by this process. See *pottery*.

coin: (*koyn*) a small object made from hard materials, often metals, at standard sizes and weights and used for exchange and purchases.

conservation: (*kahn-sir-VAY-shun*) the careful cleaning, preserving, and repairing of artworks and artifacts.

excavate: (*EKS-kah-vayt*) in archaeology, the systematic process of digging out, recording, and removal of artifacts from a particular site.

fragment: (*FRAHG-mehnt*) a small piece broken off from a larger object

garum: (*GAYR-uhm*) a spicy, salty fermented fish sauce, popular at ancient Roman banquets

paleontology: (*pay-lee-ahn-TAH-loh-gee*) the study of ancient animals who lived before humans appeared.

pottery: (*PAH-ter-ree*) objects, especially vases and other vessels, made from fired (baked) clay.
see *ceramic*.

stratigraphy: (*strah-TIH-grahf-ee*) the study of layers of rock and soil; in archaeology, the use of such layering to determine the age of objects and the sites where they were found.

transport amphora: (*TRAHNZ-port AM-for-ah*) a heavy-duty, thick walled storage jar, often with a pointed bottom, used to store and transport trade goods throughout the ancient world. See *amphora*.

urban archaeology: (*ER-bahn ahr-kee-AH-loh-gee*) a branch of archaeology that specializes in the study of human life and development in towns and cities.

Additional Resources:

Websites:

Memorial Art Gallery of the University of Rochester (<http://mag.rochester.edu>)

MAGexplore: web-based collection exploration (<http://mag.toursphere.com/en/index.html>)

Museum of Underwater Archaeology (<http://mua.apps.uri.edu/misc.htm>)

Videos:

Researchers from the University of West Florida are slowly uncovering the remains of a 16th-century shipwreck of a Spanish galleon in the shallow, murky waters near Pensacola Bay, Florida. (4:07)

<http://www.smithsonianmag.com/videos/category/history/underwater-archaeology-in-pensacola-bay/>

The Archaeological Institute of America (AIA) wants to help K12 educators bring the fascinating subject of archaeology into their classrooms as a springboard for teaching scientific methods, critical thinking and writing, and analytical skills across the curriculum. Our Lesson Plans (www.archaeological.org/education) include several classroom excavation projects:

<https://www.youtube.com/playlist?list=PL92136BEA9C0BE96F>

In this video, Dr. Loren Davis and students of the Oregon State University archaeological field school at Cooper's Ferry talk about the concepts, practices and goals of archaeology.

https://www.youtube.com/watch?v=y2ryNn_TRLE

English Heritage: Archaeology at Work: Looking for and Uncovering the Past

Archaeology at Work is a series of films that introduces the methods and the equipment used by archaeologists today. The first two parts deal with the discovery and excavation of sites

<https://www.youtube.com/watch?v=TFejkYDH9Q>

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