

Basics of Archaeology for Simulated Digs

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Archaeological excavation is conducted in a scientific manner and the process of digging and thinking about a site teaches skills of critical thinking and analysis that apply to many topics and disciplines. The following definitions, rules, and suggestions will help teachers explain archaeology and the goals of excavation to their students and allow them to design and conduct a simulated dig based on archaeologists' approaches.

Definitions and explanations

Archaeology

Archaeos = old, ancient Logos = word, study. Archaeology is a discipline, a systematic approach to uncovering the past, and a way of thinking. Archaeologists dig up and study the physical (material) remains of people who lived long ago, including their public architecture, private houses, art, objects of daily life, trash, food, and more, to answer questions about who the people were, how they lived, what they ate, and what their lives were like.

Excavation

Archaeological excavation is digging, recording, and interpreting the physical remains of the people who lived in an area in order to understand their culture.

Site

Any place where humans left substantial remains.

Culture

The beliefs and behavior of a group of people. These cannot be excavated; however, the material culture (the objects and structures) people leave behind give us clues to their beliefs and behavior.

Material Culture

Tangible remains of cultural behavior: the tools, houses, art, food, and other objects and structures of people who lived in the past. Remains made of inorganic (never living) materials, such as stone and clay, survive better than those of organic (once living) materials that can rot

and decay, such as wood, plant fibers, and animal hides. Both survive best in dry, sealed (air-tight) environments.

Artifacts

The objects, tools, pottery, and other items people used that have survived to be found by archaeologists. Artifacts are made or modified by humans and are portable.

Features

Structures made or modified by humans, such as buildings, pits, post holes, and caves.

Context

The association of artifacts and features found within a particular area or layer, and the relative position and relationship of this area or layer to the ones above it and below it. The context of archaeological finds is what allows us to interpret them and understand their function and meaning.

Strata = layers (stratum = layer)

Stratigraphy = a series of strata, the study of the strata

Dirt, rubble from fallen buildings, and other debris that have built up in layers around the artifacts and features of past cultures. Successive strata may reflect entirely different time periods and cultures or different times within a single culture. Older layers are on the bottom, unless an earthquake, human activity, or other catastrophic event changes their position.

How sites become lost

Theft and re-use: These are significant reasons why objects, art, structures, and sites disappear. Buried sites are seriously damaged by illegal digging, a form of theft.

Even very large, famous monuments (the pyramids of Egypt, the Colosseum in Rome) that have been in view, unburied, for thousands of years, have suffered during the periods when they were not considered culturally important and protected. Aside from some damage by time and weather, the exterior stones of the pyramids and half the outer ring wall of the Colosseum, along with all its structural and decorative stone and metal attachments, were removed and re-used by people. On a smaller scale, vandals and graffiti also damaged the sites. Now that the monuments are tourist attractions, they are protected again by society.

Sites become covered over with layers of dirt: Think about what happens today if the trash collectors go on strike. In the ancient world there was generally no trash collection, and since foodstuffs and many of the materials people used were bio-degradable, ordinary trash could build up, decay, and turn into soil on a site even while it was inhabited. After a while, people sometimes needed to raise their floors or their entire houses above the accumulated sediment. This might happen several times, and each rise in floor level left a new layer.

Disasters cause strata to form: If houses burn down in a fire or are damaged by war or an earthquake, the owners may not clear all the rubble away, but rather smooth the site over and build on top. The new houses will be in a new layer above the layer of earlier houses. If many houses burn down, a whole city may rebuild itself on top of the fallen houses. A city that started on flat ground may end up on a hill made of earlier layers, each layer from a different time the houses burned or were re-built for other reasons. Repeated floods may similarly damage a site and cause layers to build up, as in Egypt and Rome on the Nile and Tiber rivers.

Herculaneum, a Roman city located near Mount Vesuvius, was buried in volcanic mud from the volcano's eruption in 79 CE. Many hundreds of years later a new city was built on the stone above the old city.

Abandonment: If people abandon a city (perhaps because of drought or war), the houses eventually start to fall down from neglect. People scavenge building materials, animals move in, and weeds, grass, and eventually trees start to grow over the structures. After a long time, a city can disappear, covered by dirt and greenery.

Discovery, research, and excavation

Excavation is one way archaeologists find out about a site, but it is not the only way, and not the first way. When archaeologists dig, they always do so for a reason, and they have some information about the area that leads them to think they will find a site. They know something about the place being excavated, and they have specific questions. Only then do they dig. They do not just look around for somewhere to dig and then go treasure-hunting.

Reading stories, listening to farmers' reports, examining maps, walking the landscape to get a big picture of possible habitation, using technology such as ground-penetrating radar to peer under the ground—these and other techniques all help archaeologists figure out where and when people lived in an area.

In classroom excavations, the teacher should know the story of the site and might stress that there have been surface finds leading to an interest in the cake/shoebox/schoolyard site. A dig can begin with examination of such finds. The teacher should design the dig with a story in mind and, after showing students the surface finds, discuss with them what kinds of inferences or hypotheses they can generate. Alternatively, the teacher may choose to start with the story to engage younger students' interest.

Excavation units

Archaeological sites are generally divided up into squares to help archaeologists record finds precisely as they dig. The AIA small-scale digs are created in a square or rectangular cake pan, in a rectangular shoebox, or (in the schoolyard digs) in larger squares dug into the ground. These mirror real archaeological excavation units.

Digging with trowels

When digging, archaeologists excavate horizontally and do not dig holes. They use flat masons' trowels rather than gardening trowels, which are more like scoops, because archaeologists remove soil in flat, horizontal movements designed to expose but not scoop out artifacts. They do not remove any finds until they have noted their position and found all the objects around them that could be related in some way. Otherwise, they could miss important associations between artifacts, or they might accidentally dig through two layers and merge the artifacts from different contexts.

Since trowels do not come in small enough sizes (and can be expensive), for our small dig lessons students use spoons, even though these are not ideal. Spoons are more like gardening trowels than masons' trowels, and it can be hard to use them without digging holes, especially since the soil in a simulated dig is far looser than in a real site. Nevertheless, the principle of horizontal excavation should be emphasized. Since the shoebox sites are small, it is possible to pack the soil down firmly and to dig carefully, removing small amounts of dirt and working sideways, not downwards.

Numbering layers, contexts, and finds

Archaeologists record everything, and they do so far more carefully than will be possible for students, especially younger ones. Every find is recorded horizontally and vertically, and not just each layer, but also each feature and each change within the layer is also recorded separately.

In a relatively simple simulated dig, just keeping track of layers will be sufficient to make the point that preserving context is important. However, it is essential to label and bag some artifacts separately, even when they come from the same layer, whenever there is something clearly different about their environment or they clearly belong together. Changes in soil texture, soil color, and finds signal a significant difference that must be noted. A trash pit dug into a floor or a ring of stones used as a fire pit will be given their own bag and the finds within them recorded separately.

When excavators do not see any changes, or are not sure exactly what they are seeing, they generally make a transition to a new layer at a pre-determined, arbitrary depth, such as 10 centimeters. They do this to protect against accidentally mixing artifacts from different contexts. In most cases it will not be possible or productive for teachers to enforce this level of care in recording, but they should emphasize the basic principle and require some record-keeping.

Noticing changes within and between layers

As they dig, archaeologists pay attention to the color, texture, hardness, composition, and even smell of the soil they remove. In the cake excavation, students will be able to note color and perhaps smell as they dig, and the layers may have texture differences as well (or texture can

be added in the form of nuts and raisins). In the shoebox digs there should be differences in soil color, texture, hardness, and composition. Even the odor of a layer may be enhanced by adding herbs or ground coffee.

A schoolyard dig of only one layer can incorporate horizontal changes; for example, a “fire pit” (a circle of stones with charcoal inside) could have darker soil above or in it, perhaps darkened with ashes or dark potting soil. Artifacts inside the pit would be bagged separately.

When students notice a change in a layer or encounter artifacts, they should dig more slowly, removing small amounts of soil horizontally rather than digging deeper in one area. They can brush finds to expose them. As they remove soil and put it into a container, they should check for small artifacts they might have missed. Only when they have exposed all the artifacts at the same level may students remove them and bag them, labeling the bag with the layer number.

Archaeologists generally sieve the soil they excavate, either gently shaking the dry dirt through a screen, or floating the soil in water before screening it (water-sieving) to catch small objects, seeds, and other finds missed during digging. This is only feasible on a schoolyard dig.

Top plans and record sheets

Even with very young children, the teacher should explain the concept of a top plan (used to record the location of all artifacts in a square in every horizontal layer) and a record sheet (used to list finds, describe and possibly draw artifacts, and write comments about the objects, their context, and the layer in which they were found). The teacher should help students draw the rough location of artifacts on graph paper, and children should record to the best of their ability the types of artifacts in each layer.

- A simple top plan can consist of a sheet of graph paper with a square or rectangle drawn on it to represent the top view of a square in the cake/shoe box/schoolyard excavation area.

Young students, who are too young to measure artifacts and plot them on a top plan, can start to learn how using two pieces of graph paper on which the dig square is outlined. On one, the teacher sets out small pieces of candy. Students count down and across to locate the candy, and then they do the same on the other piece of graph paper to plot a circle that stands for the candy. After plotting correctly students can eat the “artifacts.” The teacher can substitute raisins or small keepsake objects instead.

Sample record sheets are included in the lessons. The record sheet may need to be modified depending on the age of the students and the number of artifact types in each layer. The teacher can easily create his or her own record sheets with paper and graph paper.

Excavation materials

- Spoons and brushes
- Shoe boxes (if relevant)
- Containers for excavated dirt
- Small plastic bags to hold the artifacts from each layer

OUTREACH AND EDUCATION

- Waterproof black markers to label the bags
- Top plans and clipboards
- Record sheets
- Rulers and pencils
- Artifacts or laminated images of artifacts
- Sieve

Schoolyard digs of larger scale need additional supplies; at the least, masons' trowels and a large sieve. See the lesson.

Dig design tips

Students will be able to identify the transition from one layer to the next more easily if the colors of the layers are different. Sand, dark soil, and soil additives such as white vermiculite can be included to create strata of varying colors and textures. Teachers can also mix in other components (coffee, sugar, herbs, birdseed) to add more variety in texture and even smell. (Warning: fine additives can sometimes sift down into lower layers and confuse the diggers.)

On a real (not simulated) dig, the soil becomes compacted, and objects are held in place. The soil on simulated digs is generally loose, which makes it easier for objects to be moved out of position. When creating a dig, the teacher should compress the soil layers as much as possible to mimic the compact soil layers on a real site.

The teacher should invent the story of the site and keep it in mind while designing the dig. The changes that occur in the artifacts from one layer to the next cannot be haphazard; they should make sense and allow students to make inferences as they dig.

When feasible, to help students analyze the dig site and test their assumptions, some surface finds should be visible to suggest the nature of the site. Some finds may even seem contradictory. If they have been given clues, before students begin to dig they can discuss what they expect to discover based on the finds. Then, as they excavate, they can revise their ideas and reinterpret.

Preserving the context of finds is important, not just for comparing the finds from one layer to the next, but also for identifying artifacts associated meaningfully within a layer. Ideally, artifacts that are separated but belong together can be included in some of the simulated dig layers. Students will see how careful, horizontal digging and brushing expose the full context and clarify the connection between finds. For example, a pot's shape or design may only be recognizable once all the pieces have been found, or its function only understood once the spilled contents have been excavated.

Recording and measuring are essential. Even very young children should attempt to record and draw the site and finds as well as they can.

Start and end with questions

Start by asking what conclusions students draw from any surface finds.
What do they expect to find as they dig? What questions do they have?

How can students identify a cultural change?

Students can be guided toward answers using artifacts relevant to their grade level. A change in video game themes or technology or fashion styles might show a change within one culture, or the popularity of certain song titles might change.

What might suggest a completely different culture?

A change to different, all-new artifacts between one layer and the next might show a more sweeping change in people or culture. The language of written documents might change, for example. For older students, evidence of conflict followed by new types of artifacts might reveal cultural changes associated with war. The AIA dig lessons reinforce the importance of noticing changes.

SAMPLE DIGS

In the **Layer Cake Archaeology** project, students see a site changing across stratigraphic layers easily identified by color, smell, and taste.

In the **Shoobox Dig**, a change in the material culture of different groups with different interests is shown through changes in food and artifacts.

In a **Schoolyard Dig**, the teacher will have the greatest opportunity to develop a complex site and “back story” in just one layer. One-layer sites are more than sufficient for teaching the importance of digging carefully and preserving artifacts’ relationships to the objects around them. One realistic way to do this is to place related objects near one another (such as a bowl and a spoon, or the beads of a necklace). Another is to break something (a pot with an image that cannot be fully understood if pieces are missing, for example) and scatter the pieces in the same area.

Summing up and thinking ahead

Digs hardly ever answer all the questions the archaeologists had in mind. They generally lead to further questions that the excavators hope will be answered by additional digging at this or other sites. At the end of excavation, the class should summarize the questions students have answered. *What new questions have come up? What kinds of evidence would students expect to find if they continued to dig in this area?*

At this point the teacher can tell the story of the site if it has not yet been revealed. It is unlikely that in a real-world situation the archaeologists would learn the story of the site the way a teacher can tell it to students!