

# Basics of Archaeology for Simulated Dig Users

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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 carry over to many different 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 conduct a simulated dig in a professional manner.

## DEFINITIONS

### Archaeology

*Archaios* = 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 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, that are not portable.

### 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)

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

Human theft and re-use 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.

Students wonder how a site can 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 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 located 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.

One famous ancient city in Italy, Herculaneum, was located near the volcano Mount Vesuvius. Lava and mud from the eruption of the volcano buried the city. The ashes hardened and turned to stone. Many hundreds of years later a new city was built on top of the stone, right above the old city.

- ✦ 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 grass and trees start to grow over the structures. After a long, long time, the city can disappear from sight, covered by dirt and greenery.

### 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 are knowledgeable about the place being excavated, and they have specific questions. 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 stress in his/her back story that there have been surface finds leading to an interest in digging the cake/shoe box/schoolyard area. Ideally, the dig will 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 small-scale digs described here are created in a square or rectangular cake pan, in a rectangular shoe box, or (in the schoolyard digs) in larger squares or rectangles dug into the ground. These mirror the shape of 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 most of our dig lessons students use spoons, even though these are not ideal. In our dig kits we provide miniature plastic trowels when they are available. 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 spoonfuls of dirt and using proper procedures.

### 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 numbered 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 artifacts separately, even when they come from the same layer, whenever there is something clearly different about their environment. 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 number and the finds will be separately labeled. 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 cms. They do this to ensure that they are not 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 form of 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, if composed 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.

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 spoonfuls of soil and put them into a container, they should check for small artifacts they might have missed. Ideally, they will sieve the soil as archaeologists do. Only when they have exposed all the artifacts at the same level may students remove them and bag them, labeling the bag with the specific, unique 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.

### Top plans and record sheets

Even with very young children, the teacher should make an effort to 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, possibly describing and sketching each artifact as well.

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

Young students, who are too young to measure artifacts and plot them on a top plan, can practice with 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 the point. If they plot all the candy correctly, they may be allowed eat it. 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 varied slightly depending on the age of the students and the number of artifact types in each layer. The teacher can create his or her own record sheets based on the ones included here.

### Excavation materials

- Trowels, miniature trowels, or spoons (excavation tools)
- Shoe boxes (if relevant)
- Containers for excavated dirt
- Small plastic bags to hold the artifacts from each layer
- Waterproof black markers to label the bags
- Pencils
- Brushes
- Top plans
- Record sheets
- Clipboards
- “Artifacts” and/or laminated images of artifacts
- Small sieves

Schoolyard digs of larger scale need additional supplies:

- Inexpensive masons’ trowels instead of spoons
- Screens (if feasible) to check for small finds

### 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 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. (Caveat: additives can sometimes sift down into lower layers and confuse the diggers.)
- On a real 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 harder layers on a real site.

- The teacher should know 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 and develop hypotheses as they dig.
- To help students analyze the dig site and test their assumptions, some surface finds should be visible to indicate the nature of the site. Alternatively, the site can be imagined as already partially uncovered. Some finds may even seem contradictory. Before students begin to dig, they should 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 the surface finds. *What do they expect to find as they dig? What questions do they have?*

*What do students think they might notice about the artifacts in different layers that would suggest a change within the same culture rather than a change to a different culture?*

Students can be guided to think of an answer using artifacts relevant to their grade level.

- A change in Game Boy typology or skirt styles might show a change within one culture, or the frequency of appearance of certain song titles might increase or decrease.

*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. Evidence of violence followed by new types of artifacts might reveal cultural changes associated with war. The following AIA lesson plans reinforce the importance of noticing changes.

- In the **Layer Cake Archaeology** project, students will see a site in transition: from a bottom layer containing a work area (or a burial ground, if appropriate), to a middle layer where artifacts from the daily life of two contemporary cultures were preserved, to an upper level containing objects from the one culture that survived, topped off with a modern trash dump on the surface.
- In the **Transparent Shoebox** and **Shoebox Digs**, a change in the material culture of different groups with different interests is shown through changes in food and artifacts.
- In the **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. If a two-layer site is possible, cultural change can be indicated in a wide variety of ways, including a change in ceramic style from one pot type in one layer to a variation or a totally different type in the next.

### 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. S/he should point out how unlikely it is that in a real-world situation the archaeologists would learn the story of the site the way their teacher can tell it to the students!