Layer Cake Archaeology

A Confectionary Excavation

by Shelby Brown (J. Paul Getty Museum)

This fun and edible dig introduces the principles of archaeology to younger elementary ages. Students can identify clear stratigraphic cake layers, learn basics of excavation, and eat their site.

Acknowledgements: This edible excavation site owes its development to many people (including AIA member Alexandra Cleworth) who conduct archaeology lessons for elementary schoolchildren.

Warning: A miniature simulated burial is one option for the content of the lowest layer. A cake dig at Halloween can hold students' attention and provide a treat after learning. For in some contexts and for some children it will be inappropriate to simulate the excavation of a burial. Teachers should modify the project as needed to meet their own classroom goals and to accommodate their students, and they should be sensitive to cultural standards.

Overview

Almost everyone likes cake! Digging (and eating) the layers of a cake is a fun and easy way for children to learn the basic principles and techniques of archaeological excavation. The cake can be designed to be completely edible, with layers filled with raisins, nuts, or candy artifacts (with attention to allergies). If greatly simplified, this is the safest and easiest cake for a large or active class or a teacher with too little help. **This sample cake uses non-edible artifacts** and requires adult supervision to ensure that artifacts are removed before anyone starts eating.

Grade levels

This fun excavation works well with early elementary grades.

Goals

Students learn basic archaeological terms and concepts through excavating and eating a stratified cake. They use teamwork and observe how information is lost when layers are mixed.

Overarching goals are to:

- introduce children to the principle of stratigraphy.
- illustrate the importance of "not digging holes" (artifacts together tell a story).
- model excavation strategies of excavating one layer at a time.
- show how digging carelessly can mix layers and disguise cultural change.

- allow students to experience in a kinesthetic way the fact that excavating an archaeological site destroys it.

Although the value of careful recording in archaeology (and social science and science) cannot be overestimated, record-keeping will need to be very simplified with young students. They should still be asked to do some form of recording, and the dig should end with discussion of what students observed in each layer and why it is important to dig one layer at a time.

Time needed

Introducing essential concepts, digging, recording, discussing, and eating will take several hours. If students draw a plan of each layer the dig will take longer.

Materials and preparation

The teacher and helpers should read AIA's *Basics of Archaeology for Simulated Digs*. They will need to bake three cake layers in advance, each a different flavor and color: vanilla, strawberry, and chocolate are reasonable choices. Either pre-selected candy or non-toxic, non-melting objects may be baked directly into the layers, or (as here) toy artifacts may be added after the layers have been baked and before they are stacked to create the site. The total time needed to prepare the site will be about 1 1/2 hours; this does not include finding artifacts and baking!

Supplies for baking and digging the cake dig site:

- Chocolate, vanilla, strawberry cake mixes to make layers of different colors
- Square or rectangular loaf pans (to mimic the excavation units on a site)
- Small, shallow metal teaspoons (excavation tools)
- A container to hold excavated cake and cake crumbs
- Small plastic bags to hold the artifacts from each layer
- Waterproof black markers to label the bags
- Disposable gloves, as needed (although digging in gloves is difficult)
- A big plastic tablecloth to work on!

Artifacts

The artifacts suggested here can be replaced depending on the availability of other objects and on a teacher's ideas about the history of the cake site. Small, laminated images of real artifacts can also be used. Artifacts in the layers can also be greatly reduced in number and simplified.

- Small dolls' fast-food containers and plastic dishes ("Barbie" sizes)
- Tiny plastic tools and dishes, perhaps Lego objects
- Extremely small tea set of a different style and color from the plastic dishes (there are many such doll tea sets of thick, durable porcelain, but the teacher must decide whether any breakable material is appropriate)
- Shopping cart refrigerator magnet or other topsoil "trash," such as a tiny soda bottle
- A small plastic Halloween skeleton (see *Warning* above), surrounded by jellybean "stones" and accompanied by small toy possessions, can be put into one layer.

Record sheets (for students old enough to record their finds)

- A top plan for each layer (a sheet of graph paper with a square or rectangle already drawn on it can represent the excavation square)
- A record sheet for each layer (a simple version just requires a list of artifacts found in each layer; a more complex version has a description and sketch of each artifact. See AIA Record Sheet samples).

Designing the cake dig and preparing the layers

The themes and artifacts presented here are optional and can be modified by the teacher to meet classroom goals.

- Lay out the three cake layers on a table. Trim the tops as needed to make them level.
- When seeding the layers with artifacts, stay a few inches away from one edge so a thin slice can be removed from one side to reveal the stratigraphy of the stacked layers prior to excavation.
- Push artifacts from the top into small cuts into the layer or into shallow cut-out rooms. The disturbed surface will not be apparent during digging.

Bottom layer

- Gently cut a chamber into the layer and leave evidence to identify it as a tool room, work area, kitchen or other space with objects different from the layers above.

Skeleton option

Line the chamber with jellybean "stones." Put the Halloween skeleton inside (see *Warning*, above) and provide the figure with burial gifts, such as a small plastic dagger and pot or bowl. Plug the top of the chamber with half the remaining cut-away cake, leaving the surface sunken, and top it with more jellybeans to raise the height back to surface level.

Middle layer

- Create a grid of 4 smaller squares on the cake surface by laying fine string or dental floss across the top.
- Gently push several small porcelain dishes and cups from a tea set into different areas of the cake.
- To make the analysis more complicated, leave one quarter free of porcelain artifacts and fill it with small plastic dinnerware. In this scenario, two types of dinnerware were in use here, and only one will continue in use in the later top level.

Top layer

- Gently push small plastic dishes into the top layer to suggest a picnic. Here you mainly notice surface "trash" (see below).

Stack the layers

Wrap tin foil around three sides to help hold the site together during digging. Leave one side exposed and cut off a slice of cake about an inch from the edge to reveal the stratigraphy.

Carefully stack the cake in three layers. If the cake is crumbly this will not be easy, so aim for firm cake dough and make sure that seeding the site with artifacts does not damage the cake layers too badly. (The two top layers of the cake in these pictures did not stack easily.)

On the surface

(This is for fun, and to show that dig sites do not usually start out neat and clean.)

- Create an abandoned lot on the top by scattering doll-sized fast-food cartons and leaving the shopping cart magnet (or a similar clue) tipped over onto its side.

Classroom procedures

Introduce archaeology
The teacher should introduce the concepts of stratigraphy and stratigraphic excavation and should define archaeological terms. See *Basics of Archaeology for Simulated Digs.*

Assign teams
Depending on class size, the students can be divided into small teams who take on responsibility for part of a layer. So that everyone can participate, two or three teams might excavate different parts of one layer, the members of each team taking turns to dig the cake and (if relevant) draw a top plan, record finds, and write down observations.

Tell the story of the site
The teacher may invent a story about the layers (based on the artifacts chosen) and tell it either before students begin digging or after excavation has ended. Waiting until the end of digging to tell the story allows students to develop and revise their ideas (hypotheses) about the site as they uncover the layers.

With younger ages, telling students the story first may encourage greater investment in digging properly. Making the story dramatic helps. For example, the burial may be of a great leader, buried in a special way for some interesting reason. The story should directly relate to the artifacts at the site, although some materials can be described that would logically have decayed over time and disappeared. At the end of the dig, more details can be revealed.

Excavate
When the layers are different colors, it is easy for students to dig only one layer at a time. During excavation students should be reminded to go slowly and avoid snatching up finds before they notice how the artifacts may be related. They should stay within one layer and (if possible) preserve finds in bags labeled with the layer number, and draw a simple top plan.

Pitfalls

Cake is messy and it is not easy to dig with a spoon. Archaeologists use a trowel because it is a flat tool that lets them work sideways and remove only small amounts of soil. Students need to be reminded to dig carefully. Creative flat alternatives to spoons may work.

If the layers have too many artifacts, these may become confusing and will certainly be hard to record, yet too few artifacts may mean that not everyone can find something. All team members need to know that they are contributing, whether they are digging or recording, finding artifacts or not.

It is not the main goal on this (or any) dig just to "find things." Everyone shares in interpreting the puzzle—and eating the cake!

Assessment

It can be difficult to grade an excavation project on results, since it is acceptable to make mistakes and learn from them. The teacher can design a series of questions about the layers that students answer in teams, so that careful observation, excavation, and teamwork can be acknowledged. As student teams report on their observations about each layer, ask what would have happened (or did happen!) if the students were not careful excavators.

- *Were finds from different layers mixed?*
- *Was the work room or burial intact?*

Summing up

The teacher should review (or tell for the first time) the story of the site (or add some details). After discussing the dig, students can share the very crumbled cake, possibly with (or on) ice cream.

It can be a good idea to have another cake in the wings to eat instead of the dig site!

Following up (optional)

As a subsequent activity, students can draw (on paper) the possible stratigraphy under their school building. They can imagine or research, with assistance, life at the school site before the school was built, and depict the resulting material remains in layers shown in cross section under the present-day surface. Their stratigraphic drawings can range in size from notebook paper-size to the height of the classroom or hallway wall.