WHAT IS

ARCHAEOLOGY?

- PURPOSE

Chapter I introduces the student to archaeology as a part of the Social Science of Anthropology. Archaeologists study the behavior of past societies by systematically recovering and analyzing their material remains. Here in Georgia, for example, the remains of past societies are all around us. One student may have found an ancient arrow point on his family's property, or another an old bottle at an early community garbage dump. These artifacts are the subject matter of the science of Archaeology.

Such artifacts and the sites where they are found are important resources of knowledge. These resources need to be preserved so that they can be scientifically studied. There are many ways citizens can assist archaeologists in their efforts to preserve sites and artifacts in Georgia. Only by studying the past can we understand why human societies have developed in specific ways and where these societies may be headed in the future.

- CONCEPTS AND INTERPRETATIONS

The most important concept introduced in Chapter I is that of "culture." Anthropologists recognize that humans, more that any other animal, use learned behavior to adapt to an ever-changing world. Other animals use mostly built-in (biological) mechanisms for adaptation. Human groups organize their learned behavior in ways that allow them to adjust to the environments they occupy. Different groups have unique ways of passing along information from generation to generation, which also affects their adaptive potential. Therefore, if we speak of "Archaic Culture" in Georgia and assign it an age of 8,000 B.C. to 1,000 B.C., we mean that a particular way of life, resulting from a particular set of learned behavior, has been identified by archaeologists for the period between 8,000 B.C. and 1,000 B.C. We do not mean that there were no changes during those 7,000 years; on the contrary, there were many changes. What we mean is that we can distinguish in certain ways between the style of life (culture) of those groups before 8,000 B.C., those between 8000 B.C. to 1,000 B.C., and those after 1,000 B.C.

Other important concepts, techniques, and methods of archaeology are introduced in Chapter I. Several of these are explained in the context of an archaeological site that might be created by the students themselves (a picnic site). It is important that students recognize that we, in our modern world, are leaving a material record of our behavior, and that this record might well be studied by archaeologists of the future. It is only when archaeologists recover material remains in undisturbed situations, where it is clear which items belonged to which culture, that usable information can be obtained. For example, if we excavated artifacts from several different layers of a site and then mixed them all together, we would lose valuable information. If, however, we were careful to keep the artifacts from each stratum separate, we could tell the relative ages of each group and could interpret how each culture differed from the other.

The more technical material covered in Chapter I, such as radiocarbon dating and stratigraphy, should be reinforced in the classroom through the use of examples, additional explanations, resource material, or projects. The teacher may wish to utilize some of the projects outlined in Chapter IV at this time rather than wait until the end of the book.

The concluding two pages of Chapter I explain why archaeological sites are a valuable cultural resource that every citizen should work to protect and preserve. The teacher should stress that only professional archaeologists are qualified to excavate a site, because once the site is disturbed, the information can never be replaced in its original context. Therefore, sites should be disturbed only under stringent scientific controls. It should also be stressed, however, that every student can make a direct contribution to archaeology by helping to protect sites, and by reporting sites to the nearest archaeologist (this direct involvement of the student is further developed in Chapter IV).

Penny Lesson Plan

Grades K-12

Time 15 minutes

Objectives
The students will be able to learn about elements that make up human culture and how artifacts help us identify various cultures.

Topics/Content
Observation, Identification, Classification, and Deductive and Inductive Reasoning

QCCs Addressed

Learning Styles Used

Materials
Pennies (one per child), chalkboard/chalk

Procedures

1. Pass out a penny to each student. Ask, "Is this an artifact?" (Response) Yes, anything made or modified (changed) by a person is an artifact. It may not be, however, a very old artifact. Tell the class that we are going to think like an archaeologist working in the laboratory, writing down our information as we do so. Let's brainstorm and think of everything this penny can tell us aout the people who made or used it. Who can start us off? (Record the responses on the board.)
2. If the class gets "stuck", offer some hints: What do you see on your artifact?

    - Man (talk about fashion)-rags? well dressed? suit? hairstyle/beard? (male versus female)-is he their god, leader, famous person? are men more important than women in this culture?
    - Building (size/appearance)-big or small? house or public building? need technology and engineering to construct? artistic in appearance?

- Writing (English/Latin)-what language did they speak? English? Latin? Both? Which language occurs more often on the artifact? possible that the lesser, Latin, is ceremonial, for special or important occasions?
- Words (Liberty)-did the society value freedom enough to put it on a coin? (In God We Trust)-shows they had a religion/was it monotheism? (One Cent)-shows they had a numerical system and a monetary system (United States of America)-how do you know they had a government and a country? (E Pluribus Unum-From many one)-indicates that this government consisted of many groups/states.
- Dates-ask someone the date on his/her artifact. Who has an older date? Anyone else older? Write oldest date down. Who has something younger? (Write youngest date.) People used this kind of artifact during this time range.
- Letter near date-As an archaeologist looking at this artifact, you may be able to do some library research and discover that this is a mint mark, and where it was made. Who has a "D" near the date? That was made in Denver. An "S" shows it was made in San Francisco, and no letter means it was minted in Philadelphia.
- Ask everyone with a square artifact to hold it up. Ask everyone with a big, thick artifact to hold it up. Ask everyone with a small, round, thin artifact to hold it up. What does this mean? (mass production/technology/machinery)
- What is your artifact made of ? (the culture had metallurgy)

Evaluation

After you get all the possible answers, count up the dozen or more items on the board. Lead the class on a discussion of how one little artifact can tell archaeologists so much about the people who made/used it.

Follow-up Activity:
Repeat the procedure using coins from other countries.

- IMPORTANT TERMS

1. anthropology
2. cultural anthropologist
3. physical anthropologist
4. archaeologist
5. artifact
6. archaeological site
7. association
8. context
9. stratum
10. culture
11. technology
12. specialization
13. kinship ties
14. group cooperation
15. botanist
16. geologist
17. zoologist
18. multidisciplinary approach
19. Prehistoric Period
20. Historic Period
21. chronology
22. radiocarbon dating
23. absolute dating
24. relative dating
25. stratigraphy
26. typology
27. projectile point
28. artifact type
29. irreplaceable resource
30. progress
31. vandalism

- QUESTIONS FOR DISCUSSION

1. What are the differences between a cultural anthropologist, physical anthropologist, and archaeologist?

2. What is an artifact? How old does an item have to be to qualify as an artifact?

3. Define an archaeological site. What are some of the ways we are creating sites today?

4. Are we leaving behind the things that will allow future archaeologists to interpret our way of life (culture)? Give some examples.

5. Why are "context" and "association" so important to archaeologist (use stratigraphy as your example)?

6. How does the multidisciplinary approach help archaeologists in their research?

7. Describe the differences between relative dating and absolute dating.

8. What change in organic matter makes radiocarbon dating possible?

9. Describe some ways that you use typology for dating things in your experiences each day.

10. What do we mean when we say that archaeological sites are an irreplaceable resource?

11. How can we have "progress" and also preserve archaeological sites? Give some examples.

12. How can the archaeologist's studies of past cultures help people in the modern world to better understand themselves?

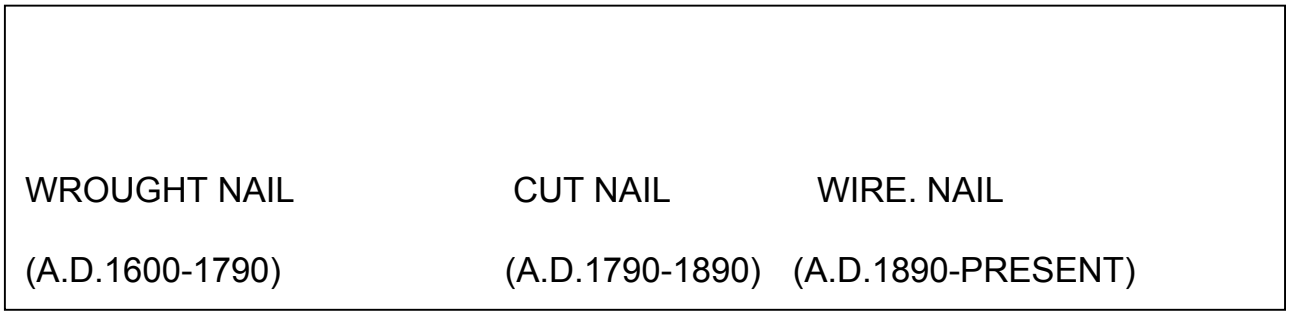
- DISCUSSION TOPICS

Typology

On page 1 of the text, we mention an oddly shaped nail, an ancient stone spear point, and an old bottle neck. All of these objects have interesting stories to tell about people. The old nail can be dated by typology (page 9), because the method of making nails changed through the years as America became a more industrialized nation.

Nails from the Early Colonial Period (A.D. 1600-1790) were made in a very crude manner. A piece of wrought iron 'was flattened into a thin bar. Then, wedge-shaped pieces were cut from this bar with a chisel. Next, the head was hand-hammered into a diamond shape. One man could make only a few dozen wrought nails in one day. Later (A.D. 1790- with the development of machines, nails were made in a way similar to the wrought nails except they were produced by machines. By this method one man could make several thousand cut nails in a day. Modern nails (A.D. 1890 - present) are made by assembly-line automation from wire. The wire is forged from giant ingots of steel, and one roll of this wire may be several miles long. The wire is fed into a machine which cuts it into proper length, stamps a head on one end and a point on the other. One man, attending such a machine, can make hundreds of thousands of nails in a single day.

If we had examples of each type of nail just described, we could easily detect the tool marks on the hand-forged nails from the Colonial Period. These nails would be very crude and no two would be alike. The cut nail would have a similar appearance to the hand-forged nails, but the work on it would show far greater uniformity. The modern wire nail would show no signs at all of hand workmanship.



Throughout human history and prehistory, life-styles (cultures) have changed. The study of the evolution of nails, and other technological items, helps the archaeologist to better understand the ways people of the past have adjusted to an ever-changing world.

In Chapter II, we describe the many cultures that have lived in Georgia. You will see that some of the earliest hunters used "thrusting spears," which were held in the hand and jabbed into large, slow-moving animals. Later, the spears were thrown like javelins at fast-moving deer. This new use brought about changes in the design of the spear points. Still later, spears were thrown with the aid of a "spear thrower," and this caused other changes in design. The last two prehistoric cultures in Georgia (Woodland and Mississippian) used the bow-and-arrow. Stone points used to tip arrows were very different from spear points.

Each of these technological innovations brought about changes in the shape, weight, and style of the projectile points. Thus we can study ancient projectile points to learn about changes in hunting technology, which in turn was a byproduct of changes in food availability and subsistence activities.

Archaeologists study tool types in an effort to make sense out of the complex data that they gather. When, by means of typological comparisons, they can isolate the traits that are associated with a particular culture and a particular time period, they can begin to make cultural interpretations and reconstructions. And this, of course, is their goal--to arrive at a better understanding of people who lived in the past.

Lab Rats Lesson Plan

Grades K-12

Time 10 minutes

Objectives
The students will be able to observe similar attributes, define dissimilar attributes, and isolate, sort and classify by attribute.

Topics/Content
Observation, Identification, and Classification

QCCs Addressed

Learning Styles Used

Materials
Students

Procedures
Explain to the students that archaeologists always sort things. They wash, count, weight, identify, and record information about every individual artifact. They study hundreds and even thousands of artifacts in this manner from every site. In order to see patterns within these individual artifacts, and how they reflect human behavior, archaeologists have to sort these many artifacts into groups. Sometimes the attributes, or characteristics, of a group are very broad. Other times the characteristics of a group may be very specific. Begin a discussion, asking, "Do any of you sort things, and if so, how?" (Examples-laundry, sort by color, delicate/not, towels, or throw all together; books, sort by subject, author, size, favorites, etc.) Just as you sort books to make them easier to find, archaeologists sort artifacts into categories to make the patterns, or what they are trying to tell us about people, easier to see. Tell the students you will now play a game that shows how things can be sorted.

- Have all the students stand up. Tell them that you have chosen an attribute, or characteristic from the group and you will ask each person who does not have that attribute to sit down. After that, ask the class what is the common attribute of those still standing? (Begin with something easy, such as "students wearing glasses", but progress to more difficult things such as, "students with two syllable names"). In each instance, remind the students that there are actually two groups-one having the attribute and one without it. After showing them a few examples, let the student who guessed the attribute be the one to select the next attribute and ask students to sit down.

Evaluation

Class Discussion:

Remind the students that the class makes up one group of people, yet that group can be sorted many different ways. Likewise, archaeologists can sort the same group of artifacts many different ways. For example, they could divide everything by function, putting all the dishes in one pile, all architectural debris like brick in another, and things like toys- dolls and marbles- in a third pile. Or they could divide the same group of artifacts into categories based on what the artifacts are made of. For example a fired clay marble and a porcelain bowl would go into the same pile because they are both ceramic, while an eyeglass lens and a bottle would be in one group because they are both made of glass. The ways archaeologists group artifacts depends on what types of research questions they are trying to answer. For example, if they want to know how wealthy a colonist was compared to other colonists, archaeologists might compare the amount of porcelain to the amount of other types of dishes. They would take this ratio and match it to ratios from other sites, or from excavations of other colonists' houses at the same site.

Follow-up Activity:

Repeat the Lab Rats game, using a box of modern objects instead of students as the initial group. Repeat the procedure again, using prehistoric and historic replica artifacts or pictures of artifacts as the initial group.

Stratigraphy

One of your students may ask how the two fireplaces shown on text page 5 became buried. This is a very good question. In the prehistoric Indian stratum, we show the fireplace to be two feet below the picnic fireplace. At the time the Indian fireplace was built and used, that level was the surface of the field. The Indians did not dig down two feet and build a fireplace. They simply gathered a few rocks from the river bank and arranged them in a circle to hold the fire together and to concentrate its heat.

In the picture on text page 4, we show a river in the background. This river caused the two fireplaces to become buried over the centuries. Each time the river flooded, it produced a thin deposit of alluvium. Grass, weeds, and leaves trapped this thin layer of soil so that it could not wash back into the river. Although this one layer may have been no more than a millimeter thick, the next flood would have increased the thickness. Over a period of several hundred years these thin layers would build to quite a few centimeters of total thickness.

Looking back at the picture on text page 5, notice the thick "sand stratum." Layers like this are laid down by the river in times of heavy flooding, which occur every few decades. Occasionally, there will be a period of several "wet" years, when a number of heavy floods occur. Each individual flood may add only 5 or 6 centimeters of sand and silt, but by the end of those wet years, the total layer can be 50 or 60 centimeters thick in susceptible areas along a large river. Not all areas along a river or stream will experience deposition during floods. Some places may even lose soil during these periods.

It is this continuing process of river erosion that sometimes covers and at other times uncovers archaeological sites. This means that the archaeologist may find a site that is only a few centuries old buried under several meters of alluvium, whereas a site that is several thousand years old may lie near the surface.

Challenger Stratigraphic Puzzle Lesson Plan

Grades 6-12

Time 20 minutes

Objectives

The students will be able to demonstrate stratigraphic principles.

Topics/Content
Observation, Logic, Relative and Absolute Dating, Deductive and Inductive Reasoning

QCCs Addressed

Learning Styles Used

Materials
Challenger Stratigraphic Puzzle Worksheet

Procedures
Begin with introduction: *An archaeologist excavates a site that was used by people for a very long time. Each period of occupation is represented by a separate stratum, or soil and artifact layer. The artifacts found in each stratum are used for dating that particular layer of occupation. The date of each stratum can be no older than the oldest artifact.*

Give the students the following information, which was obtained by archaeologists researching their artifacts.

- Baseball trading card-Batting or pitching statistics are given for each year the player has been in baseball. The last date on each card is probably the date it was printed. The last date on this card is 1973. This card can then be dated to 1973 by this method.
- Aluminum can-Manufacturer was able to date this can to 1965 because of a particular type of pop top used on it.
- Auto hubcap-Manufacturer dated it to 1968.
- Roosevelt Vice-President Campaign Button-Encyclopedia gave 1919 as year Franklin D. Roosevelt ran for vice president.
- Brass trade bell-Historian said it was a type made in England between 1690 and 1715 and was used by early settlers as a trade item with Indians.
- In the stratum just above the aluminum can, someone had dug a hole in which they lost a 1974 penny. You can see that the penny is buried as deeply as the Civil War cannonball, but we know the cannonball was buried before 1974.

Using the above information, have the students put a year date on each stratum in the Challenger Stratigraphic Puzzle Worksheet. Remember, the date means only that the stratum can be no older than the oldest artifact found in it and that it was inhabited or used by people from the date of the artifact forward in time. Understanding this concept, write the word "after" with each date. (Example: Stratum IV would be "after 1934".)

Evaluation
Discuss the answers with the class. **Stratum I**-After 1974. The penny in Stratum II is later than the baseball trading card, so it dates Stratum I as well as Stratum II. **Stratum II**-After 1974. The penny dates this stratum, not the hubcap. **Stratum III**-After1965. **Stratum IV**-After 1934. The Roosevelt campaign button is older, but the quarter dates the stratum. **Stratum V**-After 1861, since the Civil War began in 1861. If a documented Civil War battle occurred in the vicinity of the site, this stratum could be dated more precisely. **Stratum VI**-After 1690. The bells were first made then.

Aquarium Stratigraphy Lesson Plan

Courtesy, The LAMAR Institute, Inc.

Grades K-12
Time 40 minutes

Objectives

The students will be able to understand stratigraphy, archaeological features, archaeological sites, relative dating, landscapes and human settlement, damage to sites, and heritage preservation.

Topics/Content

Logic, Deductive and Inductive Reasoning, Physical Science, Geology, English/Grammar/Writing, Preservation, Ethics, Relative Dates, Prehistory, History, Archaeology

QCCs Addressed

Learning Styles Used

Materials

Aquarium; stick (about 3-4 inches long and almost the diameter of a paper cup); cardboard; sturdy plastic cup or scoop; paper cup (cut in half);1 cup of potting soil; about 6 cups each of red clay, sand, and top soil; several prehistoric artifacts, replicas, or cardboard cut-outs (spear point, arrowhead, pottery, etc.); several historic artifacts or replicas (broken dishes, button, penny, etc.); narrow gardening fork or hand rake; teaspoon; and a tablespoon.

Procedures

Set Up: Place piece of cardboard lengthwise in the front 1/3 of the aquarium. (The front 1/3 section is the one that will hold the soil. You may need to place something heavy behind the cardboard to support it against the weight of the soil.) Have all other materials sitting on the table next to the aquarium.

Begin:

1. Ask the students if they would like to do an experiment and hear a story. *The word for today in our experiment is, "stratigraphy", which means different layers of soil and artifacts.*
2. Ask for a volunteer, who will come forward and take one or two scoops of red clay and pour it into the front 1/3 of the aquarium. As this is being done, talk about how *millions of years ago, only dinosaurs, and no people, lived in what is now Georgia. After the dinosaurs died, eventually other animals that are now extinct, such as mastodons, took their place.* Continue to ask for volunteers as you progress with the story. *Then people eventually migrated to what is now Georgia*.
3. By this time you have a good, visible layer of red clay in the aquarium. Ask for another volunteer, who will pour two scoops of sand on top the red clay. *A family of Native Americans was walking in search of a new home. One day they found a nice spot on a little hill that had a stream at the bottom of the hill where they could get water and fish. And there were woods nearby where they could hunt and gather plants, nuts, and berries. So they decided to build a house. What kind of house did they build?* (Wait for a response.) *The Native Americans here did not live in tee-pees. They built houses made with wooden posts. They made walls by weaving vines from post to post, and packing clay on top the vines. They put a thatched roof on top the house. So this family put up posts and began building a house.* (Dig out a small place in the sand, into the clay. Place stick vertical this hole. Place ½ paper cup behind this stick, so that the cut edge touches the glass.) *While they were building the house, the son went hunting with his bow and arrow. He shot at a deer, but missed and the arrow fell to the ground.* (Put arrowhead/replica on top of sand, leaning against glass. Have another volunteer add more sand to layer.) *Slowly the wind and the rain washed sand over the arrowhead, burying it.* (Gently cover it with sand, allowing it to remain visible next to the glass.) Continue asking for volunteers to add sand. *Meanwhile, the daughter in the family made a beautiful bowl out of clay. She was so excited that she ran to show her mother and guess what happened? That's right, she tripped and dropped her bowl. It fell to the ground and broke*. (Place pottery/replica on sand.) *The wind and the rain washed sand over it, and soon the daughter forgot all about it.* (Cover pottery, leaving it visible next to the glass.) *Eventually the Native American family moved in search of better hunting grounds. What do*

you think happened to their house after a few years? It slowly fell to the ground, vines covered it up, and the posts rotted. (Remove the stick. Instruct a volunteer to fill the ½ paper cup with potting soil, even with the surrounding sand.) *So, all the posts rotted and eventually the wind and the rain covered up the area where the house once stood*. (Tamp down the potting soil and brush the sand across the top of it.)

4. Have the next volunteer pour two scoops of topsoil on top the sand. *Two thousand years later, a family of European settlers came to the colony of Georgia. They were looking for a place to live. Suddenly, the mother saw a beautiful spot on a nice hill overlooking a river. "Look!" she said, "Let's build a house here where we can travel by river, plant and water a garden, and hunt in the woods." The family didn't know anyone lived here earlier, why not?* (Response.) *That's right, because the Native American house, pottery, and arrowheads had all been buried over the years by the wind, rain, and sand.* (Next volunteer adds topsoil.) *So the family settled here and built a house. One day a wagon delivered a crate of fancy dishes the mother had bought, after saving money for three years. They were expensive because they had to be shipped all the way across the Atlantic Ocean, from England. They were unloaded in Savannah and brought to her house by wagon. Guess what she found when she opened the crate? Many of them were broken! She was so upset she threw the pieces in the back yard*. (Place broken dishes on topsoil.) *Eventually the wind and rain washed dirt on top of them* (Brush topsoil on them. Have another volunteer add topsoil) *Meanwhile, her children would play in the yard under a big tree. But they were careless and lost some of their toys, like their doll dishes and marbles.* (Put these on topsoil.) *Eventually the leaves from the tree fell and decayed, burying their toys.* (Cover toys with soil.) *After many years the children grew up and the family moved away. The house fell down and vines covered it up. Soon you could not tell that anyone had lived here.*

5. *One day ten years ago Farmer Jones was driving in the country looking for a place to farm. He thought, "This is the perfect spot. I can live on top the hill where I won't get flooded, use the stream to water my crops and my animals, and I can go hunting in the woods." But Farmer Jones was careless and he hated to sew. Everyday he would drive his tractor through the fields plowing, loosing buttons off his clothes and coins through the holes in his pockets.* (Drop coins and buttons on top the soil.) *Eventually, he decided to retire and spend his time mending his clothes.*

6. *Now, let's look at our experiment How many layers of soil do you see?* (Three-point them out; and also a different color where our Native American house post, or feature, was.) *Which layer is the oldest, or was made first? (The red clay.) Which is the most recent, or made last?* (The topsoil.) *Which layer has the oldest artifacts?* (The sand has Native American artifacts. The red clay is sterile.) *Which layer has the newest artifacts?* (The topsoil.).

7. Ask for another volunteer. *Here we have Farmer* _____(child's name.) *Farmer ____ is going to plow the field.* (Have the child take the hand rake and gently drag it across the topsoil next to the glass. He/she may need assistance. Only go deep enough to disturb the topsoil and artifacts.) *What happened?* (Response) *The plow moved around some of the artifacts, but not too much. How many layers do we have? Yes, we still have three layers. Is our soil stain, our feature from the Native American post, still there? Yes. So plowing disturbs our site a little, but not too much.*

8. Ask for another volunteer. *Here comes our field mouse.* (Have the child dig a small hole with the teaspoon, into the sand layer, next to the glass.) *What happened?* (Response) *The field mouse messed up that one spot just a little, but what about the rest of the site? We still have three levels don't we? And we still have our post stain, right?*

9. Ask for a final volunteer. *Now we need a wicked villain. Who wants to pretend to be one? Here comes*___ (child's name), *who likes to collect artifacts. That's not too bad, except he/she likes to DIG for them! It's Saturday and* ___ *knows of a really cool archaeological site where there are lots of neat arrowheads and pieces of dishes from the early settlers.* (Whisper to the child to dig big holes next to the glass .Direct him/her in retrieving artifacts, making a general mess of the layers and destroying the post feature.) *So, let's find something neat.* (Exclaim over ever artifact, how neat it will look in his/her bedroom, etc.) After all the layers are destroyed, pretend like you hear police sirens. Tell the child he/she better hurry up and leave, since he/she doesn't have permission to be there and didn't complete the proper paperwork. Make sure the child takes all the artifacts back to his/her desk.

Evaluation

Class Discussion:

What happened to our site? (Response) How many layers do we have now? *(None. They are all mixed up.)* Can we tell which one is the oldest or which one is the youngest? *(No.)* What happened to our feature stain from the post of our Indian house? *(It is destroyed. Archaeologists will never be able to tell that there were houses here, because the post stains are permanently destroyed.)* Where are the artifacts? *The person took them home and now only his or her friends can see them.* Is it a good idea to dig a site if you are not an archaeologist? *If archaeologists excavated them scientifically, the artifacts would be stored forever where future scientists could study them and where museums could display them. Now we will never know that Indians, colonists, and a farmer once lived here, because all the clues from the layers of soil, the soil feature stain, and the artifacts are destroyed forever. That is why digging on a site without a professional, trained archaeologist is a bad idea. Trained archaeologists know how to research the site, excavate scientifically, record the clues in the stratigraphy and features, and bring the entire artifact collection to a museum or university for permanent storage, display, and future study.*

Follow-up Activity:

Have students write an essay explaining the activity and why stratigraphy and features are important. Why did so many people of different cultures choose the same place to live? What would the student do if he or she knew of someone who was looting an archaeological site?