

Archaeology: Combining History and Science (Workshops for Teachers)

Sharon Baumgartner

NEWFIELD SCHOOL

STAMFORD, CONNECTICUT

Subject: Social Studies (with interdisciplinary content related to science)

Level: Grade 6 (teachers of grade 6 in inservice workshops)

Length of Unit: Two three-hour workshops

Thematic Approach: This teaching plan is based in part on material from the following sources: *National Center for History in the Schools, National Standards for History: Basic Edition* (Los Angeles: National Center for History in the Schools, 1996), and Ross E. Dunn and David Vigilante, eds., *Bring History Alive! A Sourcebook for Teaching World History* (Los Angeles: National Center for History in the Schools, UCLA, 1996).

PART ONE: INTRODUCTION

Stamford, Connecticut, is a city with a population diversified economically and culturally. The tapestry of language and customs enriches the community. The Stamford school system is presently engaged in the revision of its mathematics, science, and social studies curricula according to national standards and state guidelines. Since revision is presently in progress, the information gathered at the *Cargoes* Institute is timely and appropriate for inclusion. This is the impetus for formulating the theme of trade route interconnections. At the middle school level in Stamford, ancient civilizations have traditionally been “spot-lighted” as separate studies of Egypt, Greece, and Rome—with no indications of various cultures existing simultaneously, or of their interactions and influence upon one another. Furthermore, although almost fifty percent of our population is African-American, the Nubian culture has not been addressed in the study of ancient civilizations.

I use archaeology to teach process skills to gifted elementary school students through simulations, role-playing and hands-on activities. In this case, study of ancient civilization provides necessary background for archaeological investigation and study. I plan to integrate this material (teaching process skills via archaeology) with a study of Egypt in conjunction with Nubian civilization. Students will come to understand how early civilizations traded with one another and will develop an appreciation for trading goods. They will

understand how archaeology has contributed to this knowledge and learn about some archaeological processes.

I want to become an active participant in my district’s revision plan and have so indicated my interest to the director of curriculum. Besides applying to participate in the district’s curriculum revision process, I am applying to present staff-development workshops for sixth-grade teachers’ district wide, in order to share with them information about the impact of trade on cultural growth in the ancient Mediterranean world and ways to teach archaeological processes in conjunction with this material. I plan to prepare model lessons and provide research packets of information with applicable lessons for easy implementation. Two units which I will demonstrate appear below.

PART TWO: STANDARDS

The material which appears here under Standards in Historical Thinking and Era 2, Early Civilizations and the Emergence of Pastoral peoples, 4000–1000 B.C., is based partly on the works on the National Standards for History, mentioned in Thematic Approach above. Although Era 2 is emphasized, some of the material overlaps with Era 3 in the World History Standards—Classical Traditions, Major Religions, and Giant Empires, 1000 B.C.–300 A.D.

The units which follow relate to the following points quoted or paraphrased from *National Standards for History: Basic Edition* (World History).

- I. Standards in Historical Thinking (see pp. 14–24 in *National Standards for History: Basic Edition*)
 - A. Standard 1: Chronological thinking.
Students will interpret date presented in time lines.
 - B. Standard 2: Historical comprehension.
Students will draw upon data in historical maps and will utilize visual and mathematical data presented in charts.
 - C. Standard 3: Historical analysis and interpretation
Students will be able to compare and contrast different sets of ideas, values, behaviors, and institutions by identifying likenesses and differences. Students will draw comparisons across eras and regions in order to define enduring issues. Students will hypothesize

LESSON PLANS

about the influence of the past.

D. Standard 4: Historical research capabilities

Students will formulate historical questions from encounters with historical documents, artifacts, photographs, and other records of the past.

Students will obtain historical date from a variety of sources

Students will identify the gaps in the available records, marshal knowledge and perspective of the time and place, and construct a sound historical perspective.

II. Era 2: Early Civilization and the Emergence of Pastoral Peoples, 4000–1000 B.C. (see *National Standards for History: Basic Edition*, pp 140-145; also Era 3, pp. 146–153)

A. Standard 4: Historical Research Capabilities

Students will understand how commercial and cultural interactions contribute to change

In cooperative groups, students, through research, will understand the development of the civilization of Nubia and compare its cultural universals to those of Egypt.

Students will learn the items for trade and tribute that Nubia offered to ancient Mediterranean civilizations and the differences that characterized them.

Students will determine how important geography was to the development of the Nubian region and analyze if the societies in that region would have developed differently if the climate or geography had been different.

Students will explore the processes of archaeology as a means of discovering behaviors of past peoples

PART THREE: CLASSROOM UNITS TO BE DEMONSTRATED AT TEACHER WORKSHOPS

(Note: Unit One Focuses on subject matter content; Unit Two focuses on archaeological processes.)

I. PLAN FOR UNIT ONE: SUBJECT MATTER CONTENT (ANCIENT NUBIA)

Readings for Teachers:

Haynes, Joyce. *Nubia* (see General Bibliography)
 “Ancient Nubia.” *Calliope* (Nov.–Dec. 1996). (This magazine is especially appropriate for students.)

Plan:

1. introduction—Day 1
2. 2–3 days—Research
3. Day 4 or 5—Share findings

Concept to be learned:

How commercial and cultural interactions and political connections between the peoples of Egypt and Nubia existed

and were important.

Activities:

A. Lesson

At the End of the unit on Egypt, share pictures (or a video) of the treasure from King Tutankhamen’s tomb and ask students to brainstorm a list of what they consider the most precious valuables in the tomb. Once gold is established as prevalent throughout the treasures, inquire as to where this might have been found. Show hieroglyphic for gold (*nbw* = gold, which possibly says “Nubia”).

Share that Nubia provided gold to Egypt through trade and (when subjugated by Egypt) as tribute.

Introduce a large map of the area of Nubia. Have students note the geographic features, location in relation to Egypt, and location in the larger world of the Mediterranean area, and have them generate questions they would like to know about this culture. Chart questions.

Provide background of Nubian culture- period of time, geographic setting, and physical description of peoples through research materials made into packet form.

Divide students into cooperative groups and have them glean these first ideas of time/setting from research packets. Share findings.

Regroup and assign specific cultural universals of civilizations to individual groups, for example: economics; food, clothing (shelter); political organization; family and kin; attitude toward the unknown; communication; arts and aesthetics; recreation.

Do a review of Egypt according to these cultural universals as a sample indicator of what is expected.

Provide a time line indicating Egyptian influence/dominance/submissions for interpretation and inclusion in the group research.

In the research process, have students use components of an “I-Search” in relation to the cultural universals assigned to each group, for example: my questions; my search process; what I have learned; what this means to me; references.

Each group will share findings of the universal assigned with the class and demonstrate its leanings with a visual component (poster, drawing/pictures/building structure, or other format).

B. Assessment component

Open-book essay: Locate on a map of northeastern Africa

LESSON PLANS

the cataracts of the Nile River, zones of agricultural settlement, and the regions of Nubia and Kush. From this information, show how the geography and climate of the region affected trade in the Nile valley. What items were traded? What evidence is there from cultural as well as commercial exchanges?

Compare the development of religious and ethical belief systems of Egypt and Nubia.

Compare and contrast differing sets of ideas.

If a king of Nubia met with an Egyptian official over trade, what goods and tools would they trade? What would be the methods of transport?

II. PLAN FOR UNIT 2: ARCHAEOLOGICAL PROCESSES (INTERDISCIPLINARY WITH SCIENCE)

Readings for Teachers:

Sharer, Robert and Wendy Ashmore. *Archaeology: Discovering Our Past* (see General Bibliography).

Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. *Intrigue of the Past*. Utah: Bureau of Land Management

Plan: 2–4 lessons (in classroom)

Class Size: Any size, divided into small groups of two to four

Procedures:

Relate to students that information about Nubia was based on the archaeological record and primary sources. Give examples.

Inquire if students know what archaeology is. Write down responses.

Inform students that in the next few classes they will be grouped cooperatively and pass through four “stations” which will provide opportunities to practice the skills and techniques the archaeologist uses. “Stations” are previously arranged areas in the classroom. Names of “stations” are: Importance of the Past; Observation and Inference; Context; Artifact Classification.

Students are asked to bring in an object (artifact or picture) from home that tells about their own family’s past and place it in a box for Station 1’s “set-up.”

Procedure for Stations:

Groups will rotate to all stations and do activities at each station recording work in a folder to be reviewed each day

by the teacher. The station completion should take 2–3 days (42-minute classes) including final evaluation.

Station I: Importance of the Past

Working in groups each student tells the others in his/her group what his/her object is and what it conveys about his/her past. Thereafter, as a group they answer on the sheet provided the following questions:

- Is it important for you to know about your past? Why or why not?
- Is it important to know about the human past? Why or why not?
- What can we learn from the past?
- Brainstorm ideas and record responses.

Station II: Observation and Inference

Observation: Students will be guided to do the following:

- Differentiate between observation and inference- through a problem-solving approach.
- Demonstrate their knowledge by analyzing an archaeological artifact and creating their own observation-inference statements.

Subjects: Social studies, interdisciplinary content-science

Skills: Acquisition of knowledge, comprehension, application, analysis, evaluation

Strategies: Scientific inquiry, decision-making, problem-solving, writing

Duration: 45 to 60 minutes

Materials (included at the end of chapter):

“Boy in the Water” activity sheet and master, and “An Ancient Coin” activity sheet for each student, and/or transparencies of each. A collection of foreign or U.S. coins (one per student/team).

Vocabulary:

Hypothesis: a proposed explanation accounting for a set of facts that can be tested by further investigation.

Inference: a conclusion derived from observation.

Observation: recognizing or note a fact or occurrence.

Background:

Science is based on observation and inference. Any phenomenon being studied must first be observed, whether it be from a satellite or through a microscope. An inference is a reason proposed to explain an observation. The hypothesis is a chosen inference that the scientist will attempt to confirm or disprove through testing.

Archaeologists use observation and inference to learn the story of past peoples. By making observations about objects

LESSON PLANS

(artifacts and sites), they infer the behavior of the people who used the objects. When archaeologists find the remains of a large village (observation), they could infer that the people were farmers. To test that inference (hypothesis), they would look for evidence of farming such as farming implements (e.g. hoes), and food remains from crops (e.g. corn cobs and squash seeds). If they find these things, their hypothesis is verified. Archaeologists construct careful hypotheses when making inferences from archaeological data.

Setting the Stage:

1. Present students with a possible observation-inference scenario from their lives. Example: All the students in this classroom who ate in the cafeteria on Tuesday were ill on Wednesday (observation).
2. What many and varied reasons (proposed inferences) might there be for this illness? Examples: food poisoning, virus
3. In what ways might one or more of these inferences (hypotheses) be tested on order to come to a conclusion about the cause of the illness? Examples: Send all the students to the school nurse for examination; test the food from Tuesday; obtain a medical history from the parents of each student.

Procedure:

1. Boy in the Water (see end of chapter)
 - a. Project or distribute the master of the Boy in the Water. Project or distribute the Boy in the Water activity sheet (see end of chapter).
 - b. Read each statement and ask students to decide if it is a statement of observation or of inference. Ask them to give reasons for their answers.
 - c. How might one or more of the inferences (hypotheses) be tested?
 - d. Assist students to create a definition for observation, inference, and hypothesis.
2. An Ancient Coin (see end of chapter)
 - a. Project or distribute the activity sheet An Ancient Coin, and explain that the coin was found by an archaeologist at a site.
 - b. Which statements are observations and which are inferences? Which observation is each inference based on?
 - c. Many different inferences are possible from one observation. What others might be made from observing this coin?
 - d. Choose one inference (hypothesis) and think of ways archaeologists might test it by looking at other evidence at the site (e.g., If the people were peace-loving, archaeologists would not expect to find a lot of weapons or protective gear).

Closure: Ask students to summarize what they learned about the importance of observation, inference, and hypothesis in archaeology.

Station III: Context

Objectives:

- a) Students will use a game to demonstrate the importance of artifacts in context for learning about past peoples.
- b) A second activity is examining a student's bedroom and contextual clues therein.

Subjects: Social studies, interdisciplinary content-science

Skills: Acquisition of knowledge, comprehension, application, analysis, evaluation

Strategies: Games, discussion, problem-solving, writing

Duration: 30 to 60 minutes

Class Size: Any, groups of 5 to 6

Materials:

Index cards; "context" activity sheet for each student or team (see end of chapter for activity sheet and answer sheet).

Vocabulary:

Context: the relationship artifacts have to each other and the situation in which they are found.

Background:

The things that people own can tell something about the person. The objects a person has chosen to have can indicate the person's age, gender, and interests. For example, a baseball bat and a football helmet in someone's room suggests that the owner likes sports. Posters of pets and a collection of stuffed animals could mean that the person is an animal lover. The objects (artifacts) can only tell a complete story if they are found together, where their owners left them (in context).

Archaeologists rely on the objects that people made (artifacts) and where they left them (context) to learn the story of past people. A beautifully painted prehistoric pottery bowl has a very different meaning if it is found at a prehistoric site in a grave than if it is found full of corn in an ancient storage room. Its mean changes further if it is found in someone's modern living room—the bowl has now lost its original context and all connection with its prehistoric owners. It has become only a thing, no longer a messenger from the past.

Archaeologists preserve the context of artifacts they recover from sites by recording the location of everything they find. The artifact and its context provide more information to the archaeologist than could the artifact alone. When context is lost, information is lost.

Setting the Stage:

1. Ask the students: if I had never met you and I walked onto your bedroom, what would I know about you from the

LESSON PLANS

things you have there? Would I know if you were a boy or a girl? Would I know what your interests are? Would I know if you share your room?

2. Think of something in your bedroom that is very special to you. How does that object tell something about you, along with everything else in your room? Everything together tells about you because it is in context. You have selected certain things to have, and these things tell about you when they are all found together.
3. Now imagine that your special object has been taken from you and is found in the city park. How does this change what could be known about you? When it is removed from your room, the object alone tells nothing, and your room is now missing an important piece of information about you. Context has been disturbed, and the information about you is now lost.

Procedure:

The importance of context in archaeology can be demonstrated by the Game of Context:

1. Tell the students they are going to play a game requiring that they think like an archaeologist. Divide the class into groups of 5 to 6 students and assign each group a different number. Give each student an index card and pencil. As a group, they are to choose a room or type of building such as a hospital operating room, a kitchen, or a hardware store. They decide what objects (artifacts) in the room make it distinctive; then each student writes one clue on his or her card, for a total of 5 to 6 clues per group. Each card also has the group number written on its back side.
2. The stack of cards from each group is passed to the next group, until every group has seen every stack and tried to infer the function of each place. Be sure the other groups do not hear the correct answers. Each time, before the cards are passed, have a student remove one card and place it off to the side so it does not get mixed up with the other sets of cards.
3. The teacher reviews each group's stack, asking how many groups correctly guessed the rooms' functions.
4. Ask: Is it possible to know the function of the room now? If one object taken out of context (like a card removed at random) is able to give as accurate a picture as are all of the objects in their place or origin? This demonstrates that removing artifacts from a site removes them from their context and makes it very difficult to get a complete understanding of past peoples.

Closure:

Artifacts in context are the basis for all understanding about prehistoric peoples; archaeology is a science of context. Imagine that an archaeologist finds your classroom a thousand years from now. Make a statement about how artifacts in the context of your classroom will enable the archaeologist to learn about your class.

Evaluation:

Have the students complete the "Context" activity sheet (see end of chapter).

Station IV: Artifact Classification

Objectives:

In their study of classification based on attributes, students will use "doohickey kits" to:

1. Classify objects based on their attributes.
2. Explain that scientist and specifically archaeologists use classification to help answer research questions.

Subjects: Social studies, interdisciplinary content—science

Skills: Acquisition of knowledge, comprehension, application, analysis, evaluation

Strategies: Observation, classification, comparing and contrasting, scientific inquiry, decision-making, writing

Duration: 30 to 45 minutes

Class Size: Any, groups of 3 to 4

Materials:

"Doohickey kit" for each group, each kit containing about two dozen familiar objects, such as bolts, string, rocks, paper clips, and cloth (each kit must be identical).

Vocabulary:

Artifact: any object made or used by people.

Attribute: characteristics or properties of an object such as size, color, or shape.

Classification: systematic arrangement in groups or categories according to established criteria.

Data: information, especially organized for analysis.

Background:

A basic element of thinking is classification. We place objects and situations into conceptual categories in order to make sense of the world so we don't have to respond to each new object or situation as a completely new experience. Classification also helps us to sort a multitude of sensory impressions quickly. We classify objects almost automatically. This is accomplished by choosing certain attributes to pay attention to while ignoring other. We cannot take all attributes into account at once; therefore, we select only a few as being relevant to the task at hand. For example, if we have a group of clocks alike in every way except for color, then color is going to be the attribute used for categorization. If size is variable, then it, too, could become important for categorizing the objects.

Classification of data is an important part of any scientific study, including archaeology. Scientists must categorize data

LESSON PLANS

based on various attributes to reduce their complexity and to examine the relationships between types of data. For example, it is not possible to compare each individual house cat with every other member of the cat family. Instead, the category “house cat” includes creatures with certain shared attributes. All “house cats” are not identical, but all fall within a range of variation. The category “house cat” can then be compared with the category “tiger,” or “lion,” or “lynx.”

Objects (artifacts) left by past peoples form the archaeological data base. Like all other scientists, archaeologists classify data (in this case artifacts and site) into categories based on their attributes. A site might contain hundreds of pottery sherds which vary in appearance. An archaeologist cannot compare every pottery sherd to every other pottery sherd. Instead, he or she classifies the pottery into categories and compares the categories, thereby greatly reducing the number of comparisons that have to be made.

Procedure

1. Divide the students into groups of 4 or 5, and give each group a “doohickey kit.” Have each group organize the objects into categories, using one or more classification schemes.
2. When everyone is finished, ask each group to explain its scheme. Which attributes did they use to place an object in a certain category (shape, color, function, type of material, other)? Compare and contrast how each group chose to classify the objects.
3. Explore with students the idea that one classification system is not better than another. The utility of a given classification system depends on what the classifier want to know. When archaeologists bring artifacts back to the laboratory, they decide what they want to know, and using classification, organize the data accordingly.
4. Devise some simple questions that might be answered by classifying the objects in the doohickey kits. For example: What colors are present? How many different shapes are there (name them)? How might these objects be used? The students will need to regroup the objects based on the question asked.

Context

1. List ten things in your bedroom that your tell about you. Imagine the things on your list to be clues for an archaeologist.
2. Imagine an archaeologist finds your ten items. What might he/she know about you?
3. All the things in your bedroom are in context. What could be learned about you if the things in your bedroom were scattered all over town?
4. Why is it important to leave artifacts in place at archaeological sites?

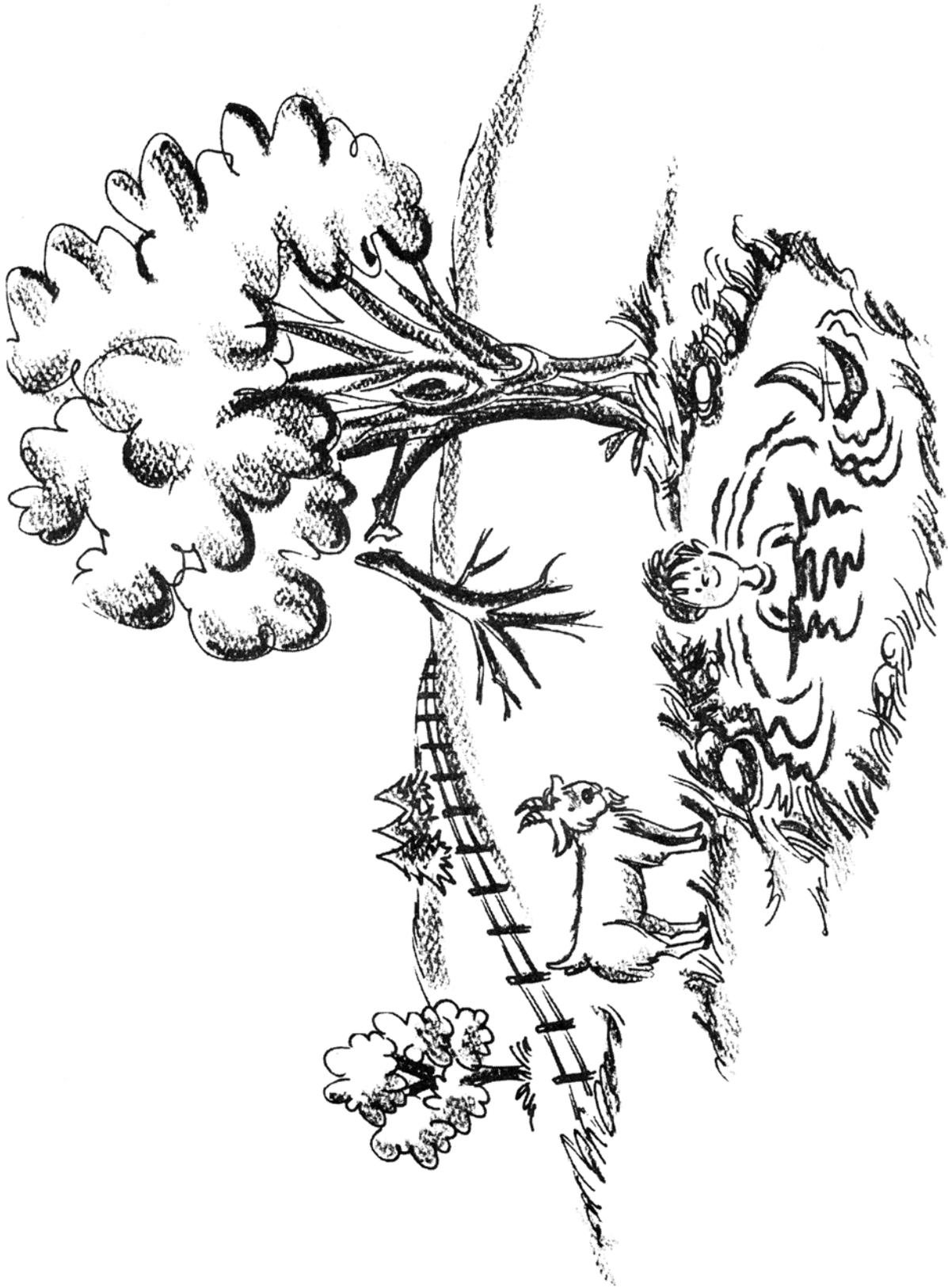
Context Activity Sheet Answers

1. List could include items such as ruffled curtains, posters, collections of dolls of model cars, certain types of clothing, photographs, other art work, the colors of furnishings, number of beds and dressers, souvenirs.
2. The listed items could indicate the student’s sex, age, interests, places they have visited, their dreams and hopes, hobbies, amount of allowances, habits, and whether or not they shared their room.
3. Since these things are out of context, they tell nothing about their owner. In fact, it cannot be established if the artifacts once belonged together, so the story of their owner cannot be learned.
4. Artifacts and their context provide the evidence archeologist need to learn about the past. If clues are removed or moved, information about the past is lost forever.

APPENDIX: Boy in the Water

Place an “I” before the statements that are inferences, and a “U” before the statements that are observations.

- ___ 1. The boy is in the water.
- ___ 2. The weather is cold.
- ___ 3. The tree branch is broken.
- ___ 4. If the boy crawled out of the water, the goat would butt him.
- ___ 5. The boy fell off the branch.
- ___ 6. A goat is standing by the pond.
- ___ 7. The branch will fall on the boy’s head.
- ___ 8. The boy fell off the rocks.
- ___ 9. There is a sailboat in the water.
- ___ 10. The sailboat belongs to the boy.
- ___ 11. The goat will soon leave the pond.
- ___ 12. The tree by the pond has no leaves on it.
- ___ 13. There are three rocks in the pond.
- ___ 14. The tree by the pond is dead.
- ___ 15. If it rains, leaves will grow on the tree.
- ___ 16. The goat butted the boy into the pond.



Boy in the Water



Place an "I" before the statements that are inferences and an "O" before the statements that are observations.

- ___ 1. There is a representation of a face on one side of the coin.
- ___ 2. The coin tells us that these were deeply religious people.
- ___ 3. The words "We Trust the Gods" are printed on the coin.
- ___ 4. On one side of the artifact is a drawing of leaves.
- ___ 5. We can tell from the artifact that these were peace-loving people.
- ___ 6. The face on the coin is a representation of the nation's king.



Ancient Coin