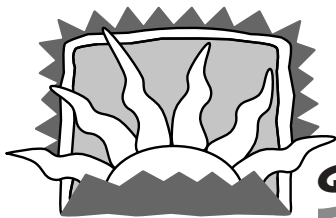


ARCHAEOLOGICAL TECHNIQUES: LABORATORY INTERPRETATION I

Lesson 4

We all have preconceived notions and personal biases, which can lead to misinterpretation. Archaeologists have personal biases also, some of which result from their specialized training. In this lesson, students will interpret artifacts.



GETTING STARTED

OBJECTIVES

- to enable students to learn the function of the laboratory in interpretation of artifacts excavated from archaeological sites
- to encourage students to understand how different archaeologists may derive different conclusions from the same artifact
- to develop deductive reasoning skills

STANDARDS ADDRESSED

Grades 4–5 1SC-E1 (PO4), Language Arts
Standard 3 Listening and Speaking
Essentials

Grades 6–8 1SC-E3 (PO2), 2SC-E4 (PO1)

KEY WORDS

analysis
artifact

MATERIALS

- Personal items children bring from home
- Paper grocery bags
- Paper and pens for documenting the artifacts and writing the story
- *Motel of the Mysteries* by David Macauley, Houghton Mifflin Company, Boston, 1979. ISBN 0395284252 (optional)

TIME

Approximately 50–60 minutes.



TEACHER'S CORNER

Personal knowledge and biases contribute to interpretation of an artifact. Someone familiar with a certain subject will have different interpretations from someone who is unfamiliar with that same subject. For instance, most people are familiar with baseball artifacts such as bases, bats, balls, and mitts. But only the most avid fans may know what the *on deck circle* (place where a batter next in line waits for his turn to bat) or a *donut* (a weight that is slipped over the large end of the bat that helps batters practice their swing) is. Someone who is unfamiliar with the game may have different interpretations than those who are familiar with it.

Archaeologists rely on their past training and experience to determine the function and meaning of an artifact. Because archaeologists bring to the laboratory different levels of knowledge and different areas of expertise, they sometimes do not agree on the interpretation of an artifact.



LESSON SETUP

The teacher should collect items from a subject area with which the students will be unfamiliar and place them in a paper bag. Examples include objects involved in training a dog, objects from a historical game that children don't play any more, or objects used in preparing a certain food dish.

Request, one week or a few days ahead of time, that students bring in one item that reflects their personalities, or something that they use often. Students may choose to bring in items that are familiar to other students. However,

encourage them to look for items with which other students may not be familiar. Teachers may also want to include items that are broken and/or have missing pieces.

The teacher collects the items brought in by the students. The teacher places items inside paper bags to prevent students from seeing items ahead of time. Prepare one bag per group of students, dividing the artifacts among the bags.



LESSON OUTLINE

1. Discuss how interpretations of artifacts can differ according to different people. Have students ever seen an object that they thought had one function, only to discover that they were wrong? Have students ever come into contact with an object and had no idea of what it was used for? Read excerpts from *Motel of the Mysteries* to illustrate the difference between interpretation and misinterpretation.
2. The teacher takes one item from his/her special collection. Lead a discussion about the object's function. Display all items. Have class try to put all the clues together and discover what the assemblage is used for. Eventually, the teacher may have to reveal the answers. Explain to the students that because you had personal knowledge of the subject matter, you were able to interpret the artifacts. Because the students had no prior knowledge of the subject, they had difficulty in interpreting the artifacts.
3. Divide class into groups, separate the groups, and spread throughout the

classroom. Have groups remove one item at a time from their group bag and analyze the item, filling out the worksheet to document their decisions. What is it made of? Who may have used the item? How was the item used? Does the artifact resemble anything they have ever seen or used before? What can you conclude from the item? Can you conclude anything in particular about the people who may have used the item?

4. Have group justify and record its interpretation.
5. Once all groups have completed their bag, ask that one representative from

each group go to the front of the class and report on the group's findings. Ask the class to help interpret the items the group may have been unable to decipher. Does anyone have any differing ideas about the group's interpretation? Does everyone agree with the group's interpretation?



PASS IT ON!

The following page should be copied and distributed to the group members to help them record data regarding the artifacts.

ARCHAEOLOGICAL TECHNIQUES

ARCHAEOLOGY LABORATORY ACTIVITY



Remove one artifact at a time from the bag and discuss it with your group. Record your observations and conclusions. Repeat the process until all artifacts have been observed, discussed, and recorded.

Item#	What is it made of?	What was its use?

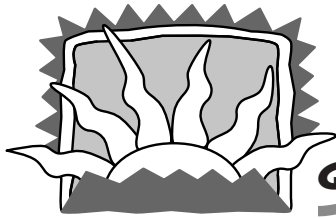
What do these artifacts tell us about the people who used them? Why?



ARCHAEOLOGICAL TECHNIQUES: LABORATORY INTERPRETATION II

Lesson 5

Creating, breaking, and reconstructing pots is a fun way to simulate the work archaeologists do in laboratories. An extension to this activity includes having students create pottery from clay instead of purchasing store-bought pots. Students can create their own designs on the pottery or may choose to duplicate Hohokam, Anasazi, or Mogollon designs.



GETTING STARTED

OBJECTIVES

- Students will learn the difficult job archaeologists have when reconstructing damaged/partial artifacts recovered from site excavations.
- Students will understand how pothunters damage archaeological sites when removing artifacts and information.
- Students will attain an understanding of the importance of pottery to the archaeologist.
- Students will associate decorations and artwork on pottery to the society that created them.

STANDARDS ADDRESSED

Grades 4–5 1SS-E1 (PO2), 1SS-E2 (PO1, PO4)

KEY WORDS

assemblage
artifact
potsherd
stylistic analysis
temper



MATERIALS

- One terracotta flower pot large enough to allow all students in the group to add their artistry to the pot. Plan on using at least an 8-inch pot.
- 4-inch terracotta flower pots, one per student
- quick-drying paint, do not use acrylic
- paint brushes, twigs, feathers, etc., any implement to apply paint
- large grocery bags, one per group
- rubber mallet or hammer to break pots
- glue and glue brushes for reassembling pots
- *When Clay Sings* by Byrd Baylor, Charles Scribner's Sons, New York, 1972, ISBN 0689711069.

Note: use a glue called "Incredibly Tacky," available at craft stores. Glue must be brushed onto each side of the potsherd that is being reconstructed. Elmer's glue, rubber cement, and glue sticks do not work. They don't dry quickly enough.

TIME

1–2 hours depending on size of the class



TEACHER'S CORNER

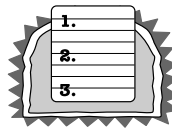
Archaeologists find many pieces of pottery. Ceramic artifacts are among the most durable objects in the archaeological record. Pieces of pottery, or potsherds, can survive in the soil under a variety of circumstances. Ceramic technology is considered a recent innovation and is associated with the change between humans as a hunter-gatherer society and a more sedentary, agricultural lifestyle.

All sciences use classification to impose order on a data group. The first step in classification is to determine assemblages, or groups of similar artifacts with like characteristics. The principle behind this method of classification is that similarities do not occur randomly, but reflect the culture or society that manufactured the object. To classify an assemblage in the present does not necessarily reflect the classification the original creators may have used. Archaeologists have used this type of classification to determine the associations of sites on a timeline. Recently, however, archaeologists have used this type of classification to study cultural aspects of a community, such as trade, population movements, and social organization.

Stylistic analysis studies the artistic and decorative traits within an assemblage. This analysis documents the traditions and decorative styles of the community that manufactured the items. Many archaeologists believe that these traits are culturally conditioned by, and reflective of, the social systems of the community. People who live in the same village will tend to create the same type of pottery, using the same temper (materials added to clay to strengthen the pottery during firing), methods, style, and decorations.

Traditionally, archaeologists have used stylistic analysis to focus on decorative layouts, motifs, and configurations. The design categories are then used to reconstruct site sequences by documenting stylistic changes through time. As people change, so do their styles.

The objective of systematic analysis of ceramic artifacts is to aid in understanding human behavior. The goal of such analysis is to explain the role ceramics hold within a cultural system.



LESSON SETUP

Divide class into teams of two or three. Each team will be responsible for painting one large pot. Make sure the students know that the large pot is for smashing and the little pot is the one they get to take home. You may find resistance to the idea that they will have to smash the pot. Emphasize that the purpose of this activity is to give the students an idea of how an archaeologist really works in a ceramic analysis laboratory. Remind them that they will still have a pot to take home. Make sure each student team paints the large pot first, before painting the smaller one. This gives the paint time to dry prior to smashing the pots. It also gives the students incentive not to dawdle while painting the larger pot.

A good introduction to the meaning and importance of pottery is the book by Byrd Baylor, *When Clay Sings*. After reading the book (entirely or partially), you may want to ask the students, "How does your clay sing?"



LESSON OUTLINE

1. Archaeologists find lots of pottery at excavation sites. Why do you suppose this is? (*Fired pottery is very durable.*) Does the pottery tell us anything in particular about the people who made it?
2. Some artwork on prehistoric pottery may have been somewhat like photographs of today. It wasn't always possible for people to take photos or videos of things that were important to them, or things they wanted to remember. People used art on pottery to record their observations, thoughts, and beliefs.
3. We can learn a lot about a people by studying their ceramics. We can learn:
 - a. what was important to them;
 - b. what types of animals might have been around at the time;
 - c. what types of celebrations they had;
 - d. in what manner they created the pottery;What else might we be able to learn?
4. It would be helpful to show photographs or slides of some of the pottery styles excavated from the Rio Nuevo archaeological sites. This will help illustrate the styles on pottery. If this is not possible, the teacher may want to compare and contrast the styles of pottery among the Hohokam, Mogollon, and Anasazi.
5. When archaeologists found pottery at the Rio Nuevo sites, were all the pots intact? (*No*) Were they whole or in pieces? (*Most were in pieces*) How did the archaeologists figure out what decorations were used? (*They had to put the pots back together as best as they could.*)
6. What happens if the archaeologist doesn't find all the pieces? (*It may not be possible to reconstruct the object.*) Where could the missing pieces have gone? (*Pieces could have been moved by rodents or reused for other purposes. Pothunters may have removed the pottery or the pieces may have never been recovered by archaeologists.*) Pothunters are people who illegally remove items from an archaeological site. Because of pothunters, we could be missing out on some valuable information. Archaeologists cannot make positive conclusions if some of the information is missing.
7. "Smash-a-pot" activity. Divide class into teams and give each team one large pot to paint. Make sure the students know that this is the pot that will be smashed and reconstructed. Have them paint symbols and objects that are important to them. The purpose of the painting is to leave clues for the group who will be reassembling their pot. The team doing the reassembly of the pot will "read" the painting group's pot for clues to the painter's identity.
8. Once student teams finish painting the large pot, hand out the smaller pots and let the students paint them according to their personal tastes. By the time they finish painting the smaller pots, the larger ones should have dried.
9. Set the small pots aside and place one large pot in each paper grocery bag.
10. The teacher should be the one to smash the pots. Take the rubber mallet and hit the bag with the pot inside once. If the pot doesn't break into more than two pieces hit it again. Once all the pots are broken, hand them out to the teams, making sure no team gets its original pot.

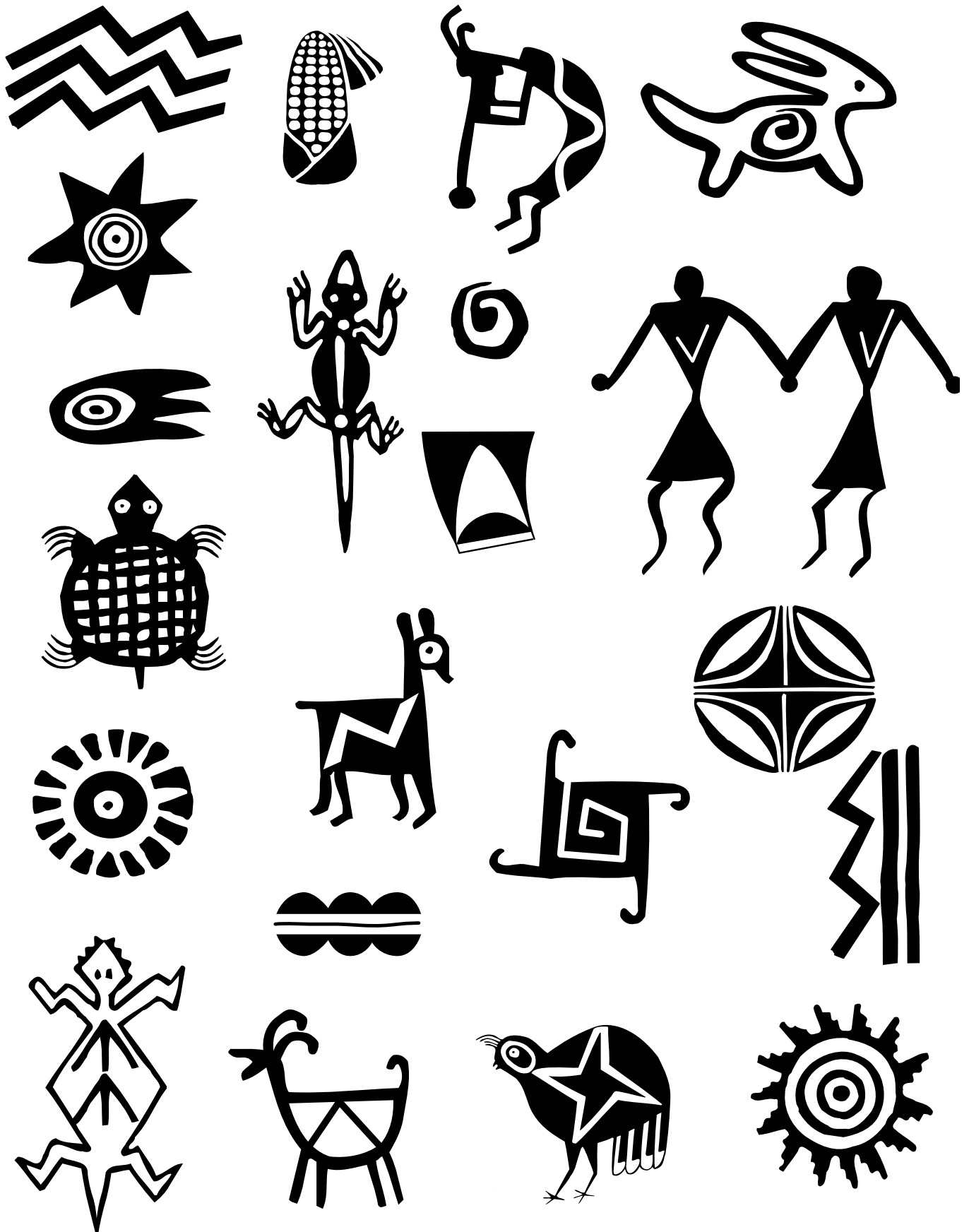
11. Pass out the glue and glue brushes for each team. Have the team look at the pieces (the assemblage) and try to get a sense of the pottery to be reassembled. Let the teams try to reassemble the pot.

The teacher can check for understanding of the lesson by leading a group discussion about the “smash-a-pot” activity. Once pots are reassembled, ask the teams to make some conclusions about the students who painted the pot. Does their clay sing as in the Byrd Baylor book? What items/objects were recorded in paint? What does this tell us about the people who decorated the pot? What colors did the painter choose? How did they apply the paint? How do archaeologists read pottery? How do archaeologists reassemble pottery?



PASS IT ON!

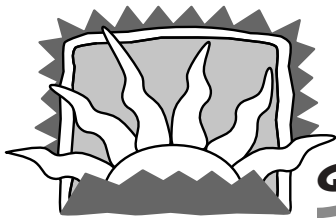
The following page may be copied for handouts to help students gather ideas for images to paint on the pots.



THE GARBAGE PROJECT

ADAPTED FROM THE "STUDIES IN ARIZONA HISTORY" TEXTBOOK

Archaeologists learn about the past by studying artifacts. Many times, the items left behind are from ancient garbage piles. By using the same techniques and examining modern trash, we can learn about modern society.



GETTING STARTED

OBJECTIVES

- to show students how deductive reasoning works in studying artifacts
- to illustrate that different assumptions can change interpretations and that removing key pieces of evidence can change interpretations
- to enable students to gain an understanding of why archaeologists are tentative in their conclusions
- to show students that the garbage they leave behind contains artifacts that can be analyzed just as archaeologists analyze other artifacts from the past

STANDARDS ADDRESSED

Grades 4–5 1SS-E1 (PO2), 1SC-E1 (PO3, PO4), 2SC-E4 (PO1), 2SC-E5 (PO1, PO2, PO3)

Grades 6–8 1SC-E3 (PO2), 2SC-E4 (PO1), 2SC-E5 (PO3)

MATERIALS

- paper grocery bags, two per household
- items from the Household lists
- Household lists can be copied and handed out to the student groups instead of collecting the items. However, using real objects increases the amount of information students will have for analysis and increases the interest and level of involvement of the students.
- paper and writing instruments for students to record their findings

TIME

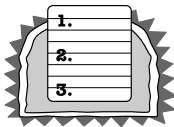
The lesson can take as little as 50 minutes and as long as 90 minutes, depending on extensions and involvement of the group.



TEACHER'S CORNER

Archaeologists learn about the past through the study of artifacts. Often this involves sifting through ancient garbage. We can learn about modern societies using the same techniques. The University of Arizona has an ongoing program called The Garbage Project, directed by Dr. William Rathje, that has studied landfills from different cities. In this lesson students will have an opportunity to analyze fictitious, but feasible, household items and draw conclusions about human behavior based upon their observations. In this exercise ***there are no right or wrong answers, just logical deductions.***

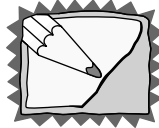
Like detectives, archaeologists use clues from artifacts to reconstruct human behavior. By studying garbage, we can apply the same reasoning to the study of modern societies.



LESSON SETUP

1. Collect all items listed on the Household List. Substitutions can be made. All items must be emptied and cleaned. Make sure all can rims are free of sharp edges.
2. On the day the project will be done, distribute items into four paper grocery bags marked with "household number 1–4 A." (1A, 2A, etc.)
3. In four separate grocery bags, place the remaining two household items that will be introduced after each group makes the first conclusions. Make sure to mark the bags "household number 1–4 B." (1B, 2B, etc.)
4. Divide the class into four groups. If the class is large, you can duplicate the

households. Instead of four groups, you would have eight. It doesn't matter that the households are duplicated. Different groups will come to different interpretations and conclusions.



LESSON OUTLINE

1. Ask students "How do archaeologists know what they know?" List their answers on the board for the entire class to see. Discuss each answer as it is given.
2. Ask students to consider why one archaeologist may come to a different conclusion than another if examining the same artifacts.
3. Bring in one item with which the students are not familiar (such as a grapefruit spoon, a tool, an old TV channel dial, etc.). The item can be broken, old or new, or just unfamiliar to the students. Pass the item around the classroom. After everyone has had a chance to view and touch it, have students discuss the artifact. What are some of their conclusions, assumptions, and interpretations? How are they making their interpretations? On what evidence are they basing their conclusions?
4. Read and/or discuss *Motel of the Mysteries*. You can also use excerpts from the book to illustrate misinterpretation of evidence. If the book is unavailable to the class, be sure to illustrate how analysts, when assuming too much, can easily misinterpret information that leads to wrong conclusions.

5. Instruct the students about what is going to happen. Each group will receive one household bag. As a group, the students must make interpretations and come to conclusions about the people of the household. Questions to consider are:
 - a. What can students deduce for *absolute certainty* about their household?
 - b. Can students tell the age, gender, and number of household occupants?
 - c. Is it possible to figure out the social status (including occupation and education level)?
 - d. Are the occupants poor, middle class, or wealthy?
 - e. What other information can students deduce from the household items?
6. Ask students to record the reasons for their deductions. Are some items more helpful in determining the answers than others?
7. Have students break into their pre-assigned groups.
8. Each group should choose a spokesperson to report on the findings of the group.
9. Allow groups ample time to analyze the artifacts in their bag. The teacher can determine the proper amount of time by circulating around the classroom and listening to the group discussions.
10. Once the interpretation phase is over, ask the spokesperson from each group to go to the front of the class. The

spokesperson should introduce the items from the household bag and show the class each item. The spokesperson should report the group's interpretations and conclusions. A class discussion should follow regarding the group's interpretations. Does anyone have anything to add? Does anyone question any of the group's interpretations?

11. Continue until all groups have reported their findings.
12. Once spokespeople return to their groups, hand out the second part of the household bags. The two remaining items must now be figured into the group's original interpretation of the first bag of household artifacts. Repeat the reporting step, as the spokesperson reports on how/if the additional items changed their interpretation and why. Have the added items changed any of the original interpretations? Make the analogy between the missing information and the damage pothunters do to archaeological sites. When evidence is missing, it is impossible to know the entire story.



PASS IT ON!

Use the following page as a handout (if not using real objects for the activity) or use as a list in order to locate objects for each household.

HOUSEHOLD #1

1. broken hearing aid or hearing aid batteries
2. diet soda can
3. large enchilada sauce can
4. small green chili can
5. plastic tortilla bag, preferably brand name (not hand-made)
6. broken Barbie doll
7. baby food jar with small screws in it
8. action figure toy
9. sawdust (can be placed inside a Ziploc bag)
10. computer floppy disk

HOUSEHOLD #1 ADDITIONS

1. *Wall Street Journal*
2. empty pill bottle labeled Nitroglycerin Tablets

HOUSEHOLD #2

1. plastic name badge on pin
2. pizza box
3. used lipstick: the most "in" color
4. hair spritz or hairspray
5. macaroni and cheese box
6. toy bear losing stuffing
7. worn women's tennis shoes: Size 7
8. SunTran bus passes/transfers
9. empty vitamin bottle
10. cat litter bag

HOUSEHOLD #2 ADDITIONS

1. baby diaper
2. *People* magazine in Spanish

HOUSEHOLD #3

1. wine bottle
2. steak bones
3. recipes clipped from a magazine
4. used deodorant container
5. empty film cans
6. *Sports Illustrated*
7. used deck of cards; preferably partial deck
8. empty cigar box
9. photographs of a basketball game

HOUSEHOLD #3 ADDITIONS

1. worn, run pantyhose
2. African American hair braid and extension conditioner

HOUSEHOLD #4

1. brown rice box
2. empty can of water chestnuts
3. soy sauce bottle
4. worn sandal
5. plastic water bottle
6. worn cloth shopping bag
7. hair tie
8. empty vitamin bottle
9. empty package of garden seeds

HOUSEHOLD #4 ADDITIONS

1. *Consumer Reports* magazine
2. broken high-heel shoe

SECTION 2

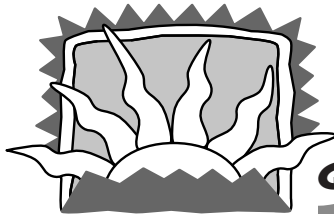


Rio Nuevo Partnership schools on tour of the excavation site.

APPLYING ARCHAEOLOGY TO RIO NUEVO

ARCHAEOLOGY AND RIO NUEVO

In this lesson, students will read newspaper articles to discover what archaeology is taking place during the Rio Nuevo Project.



GETTING STARTED

OBJECTIVES

- Students will use the *Arizona Daily Star* newspaper articles as primary research tools to discover the history, scope, and future plans for the Rio Nuevo Project.
- Students will develop a sense of community involvement by researching the Rio Nuevo Project.

STANDARDS ADDRESSED

Grades 4–5 1SS-E1 (PO2), 1SS-E2 (PO1, PO3, PO5), 3SS-E2 PO1, PO4), R-E2 (PO2, PO5, PO6)

Grades 6–8 R-E2 (PO1, PO2, PO6, PO7), R-P1 (PO2, PO3, PO 4)

KEY WORDS

Convento
granary
Hohokam
pithouse

MATERIALS

- *Arizona Daily Star* newspaper articles:
“Unearthed History to Be Reburied,” by Carmen Duarte, January 26, 2001
“Learn More About Rio Nuevo Development,” by Paola Banchemo, January 1, 2001

TIME

50–60 minutes, depending on class reading level and whether or not both articles are used.

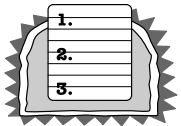




TEACHER'S CORNER

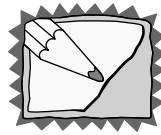
Some students may have difficulty reading the newspaper articles and may need assistance.

The information found in the newspaper articles is dated, but the articles provide a good overview for the Rio Nuevo Project at its inception. Teachers should direct the class to research newer articles and compare/contrast the information. Recent information can also be obtained through the Desert Archaeology Inc. website at www.rio-nuevo.org



LESSON SETUP

The teacher can copy the newspaper articles and worksheets to hand out for individual students or small groups; or create an overhead transparency if doing as a class exercise.



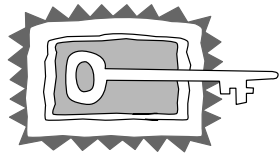
LESSON OUTLINE

1. Hand out copies of newspaper articles and question sheets. Students can either work in teams, as partners, or alone.
2. Ask students to read the articles and answer the questions in the spaces provided on the answer sheets. Remind students that it is helpful to review the questions before reading the article. This will give them an idea about what information to look for during their reading.
3. Review the topic by leading class discussion on the answers students have recorded.



PASS IT ON!

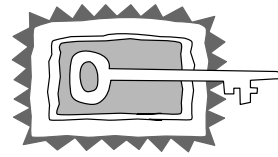
The following articles and question sheets may be copied for classroom distribution, or made into overhead slides for a class project.



ANSWER KEY

“Unearthed History to Be Reburied”
page 46.

1. West of the Santa Cruz River below “A” Mountain.
2. November 2000 to February 2001.
3. ancestors of the Tohono O’odham, Spanish conquistadors, Mexican farmers, Chinese businessmen.
4. San Agustín Mission site.
5. The archaeologists found a prehistoric village dating back 2,500 years.
6. The river contained fish and turtles. Cottonwoods, mesquites, willows, and tall grasses grew in abundance; not mentioned in the article, but gives students a chance to compare then and now.
7. corn, beans, squash, deer, rabbit, wild spinach, mesquite pods, and cactus fruit.
8. Father Kino brought written language to the area.
9. He brought wheat, cattle, horses, and chickens. He wrote journals describing what he found and mapped the area.
10. The City of Tucson operated a landfill.



ANSWER KEY

“Learn More about Rio Nuevo Development” page 49.

1. parks, walkways, museums, theaters, restaurants, convention hotel, housing and gathering places.
2. 62 acres.
3. “A”, “10”, “6”, El Con, Park Place.
4. a. water, Santa Cruz.
b. natural open, park, greenery, housing.
c. east, downtown.
5. San Agustín, Convento, rebuilt.
6. culture, heritage.
7. and 8. Students will express their understanding of culture and heritage.

Unearthed History to be Reburied

Archaeologists complete excavations on Rio Nuevo site

By Carmen Duarte

Arizona Daily Star, 01/26/01

An archaeological dig that uncovered precious Tucson history dating back 2,500 years is about to go underground once more.

But before it does, you can go today and tomorrow to view an area known as the “Birthplace of Tucson,” just west of the Santa Cruz River below “A” Mountain.

Since November, crews of archaeologists began unearthing layers of history buried there.

These past worlds were occupied by pre-historic people—ancestors to the Tohono O’odham-and Spanish conquistadores, Mexican farmers and Chinese businessmen.

The current dig is going to be covered up by mid-February and then decisions will be made later on which historic finds will be re-constructed and which will be excavated and protected.

The \$360 million Rio Nuevo project aimed at revitalizing downtown includes a cultural center and re-creation of San Agustín Mission, and the Convento where the priests lived. The mission was built in 1771.

Pithouses, irrigation canals, and a Chinese outhouse are among the discoveries at the site.

Chinese dishes, including a rice wine jar, brown stoneware, rice bowls, sauce bowls and a spoon dating from 1880–1900 will also be on display.

These discoveries and more, including stones used for pounding and grinding,

and oval and square bowls made out of stone, may be going into a cultural museum.

Plans are not complete, but the latest details by Hunter Interests of Maryland, Rio Nuevo’s master planners, show the museums were moved from west of the river to east of Interstate 10, south of West Congress Street.

Meanwhile, archaeologists Jonathan B. Mabry and J. Homer Thiel will lead crews that will continue to dig in the area and east of I-10, doing fieldwork and mapping out findings in the area that will help shape Rio Nuevo’s look.

About \$2.1 million is expected to be spent on archaeology throughout the 11-year Rio Nuevo project, which includes excavations downtown, east of Interstate 10.

So far, the findings at Tucson’s birthplace-also known as the San Agustín Mission site-make Mabry marvel.

“We found a prehistoric village dating back 2,500 years. This tells us that Tucson is the longest, continuously occupied settlement in the United States,” Mabry said yesterday while giving a tour.

Back then, the area was lush and the Santa Cruz River carried fish and turtles. Cottonwoods, mesquites, willows and tall grasses grew in abundance.

People living in the pithouses farmed corn, beans and squash. Their diet also included deer, rabbit, wild spinach, mesquite pods and cactus fruit.