

U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
ARIZONA

# DANKWORTH VILLAGE

## ACTIVITY GUIDE

1993



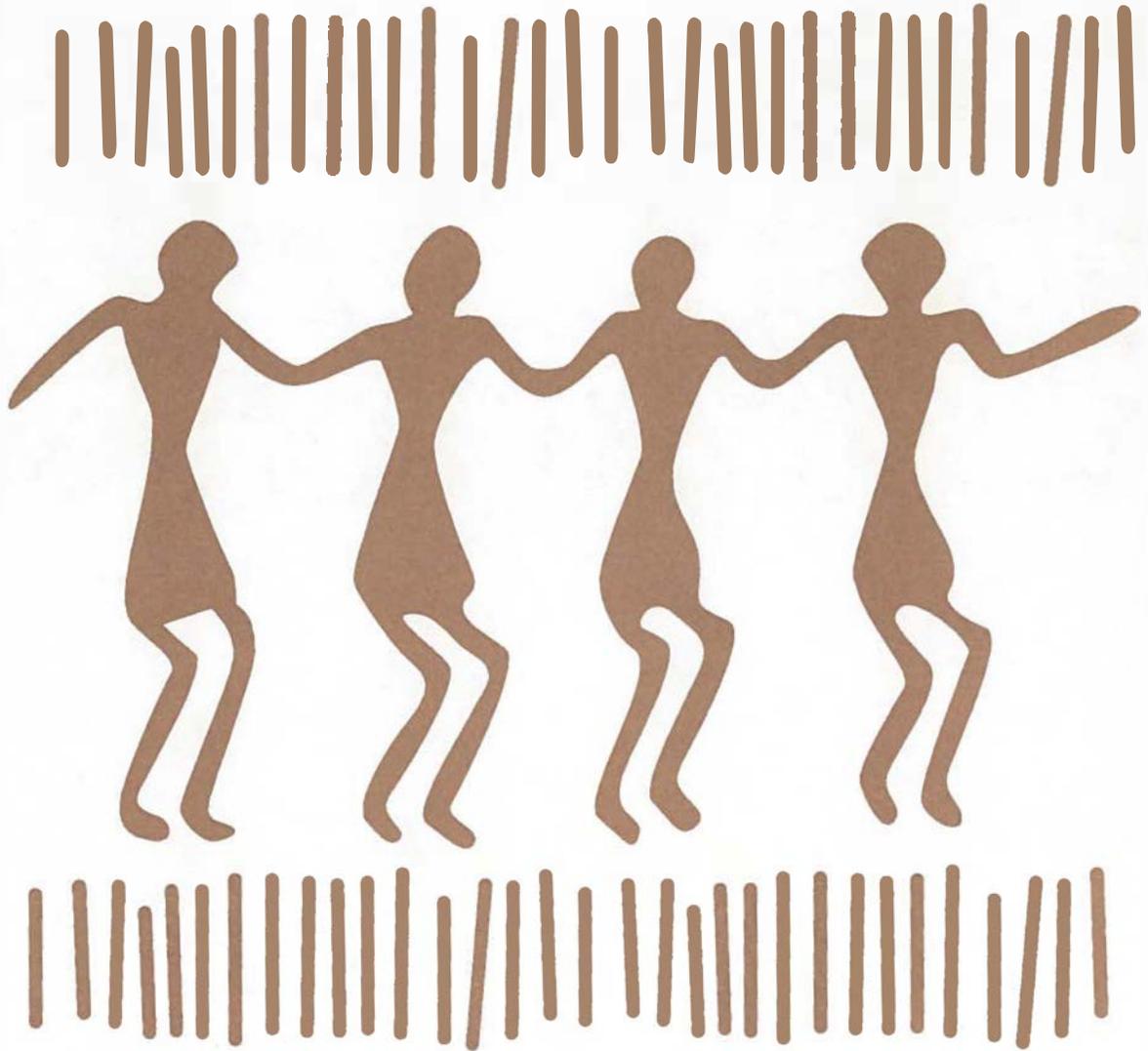
# **Dankworth Village Activity Guide**

**Manton L. Botsford**



U.S. Department of the Interior  
Bureau of Land Management





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## PREFACE

This volume is a compendium of teaching materials, exercises and testing tools. It is designed to be used in conjunction with Dankworth Village, a field exhibit of sites, dwellings, and use areas typical of those used by early inhabitants of the Southwest.

Dankworth Village is located at the Dankworth Ponds Unit of Roper Lake State Park, approximately seven miles south of Safford, Arizona.

This volume may be used intensively as a classroom unit that explores the methods and theories of archaeology or more casually by using one or more of the interactive activities.

This guide is prepared as part of the Bureau of Land Management's Heritage Education initiative. The goals of this program are to:

**CAPTURE** students' interest in history, archaeology, and science at an early age and develop their awareness of the diverse and fragile cultural resources on the public lands.

**SUSTAIN** students' interest through "hands-on" activities in history, archaeology, and science throughout higher levels of learning, and strengthen their sense of personal responsibility for the stewardship of America's cultural resources.

**ENHANCE** students' and teachers' science literacy, their knowledge of America's rich and diverse cultural heritage, and students' skills in thinking and communicating through studies and experiences involving history and archaeology.

# INTRODUCTION

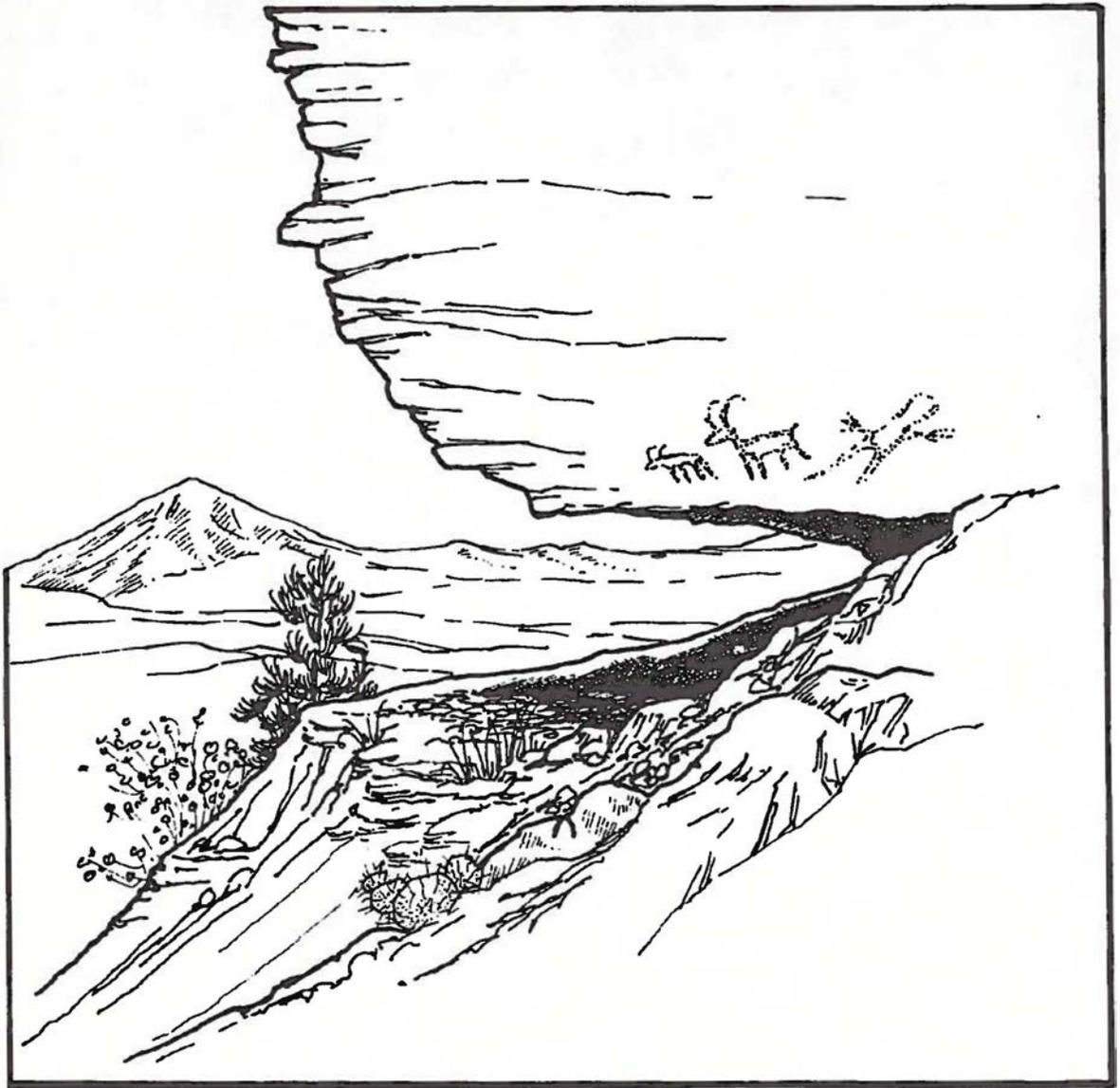
Archaeology today is a skilled, orderly, forensic science. It is not a treasure hunt or activity that focuses on digging for things. Archaeological research utilizes scientific method and is guided by research designs to make the best use of fragile non-renewable cultural remains.

Archaeology is also an interdisciplinary science drawing upon geology, biology, botany, paleontology, chemistry, history, anthropology, geography, math, and physics to solve the puzzles of the past.

Children are naturally interested in archaeology subjects. They think archaeology is fun. Through their natural interest in archaeology subjects, students can be stimulated to develop skills in science and mathematics. Archaeology education is excellent for the development of problem solving and higher order thinking skills - formulating hypotheses, inference, synthesis, analysis, and evaluation.

Archaeology education engenders appreciation for culture, prehistory, anthropology, the environment, and science.

# WHAT WE KNOW ABOUT ARIZONA'S PAST



## WHAT WE KNOW ABOUT ARIZONA'S PAST

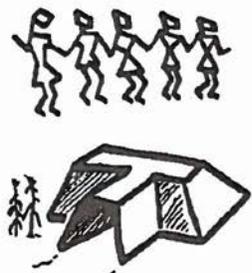
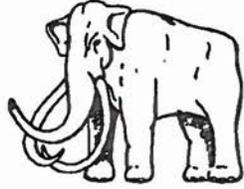
This section provides the teacher with brief information about the subdivisions of southeastern Arizona's past. It may well serve as a lead into an existing history curriculum to enhance the students' knowledge about Arizona before written records. If time allows, the discussion of each period may be expanded in the classroom and can be supplemented by individual reports by students, video *The Early Americans*, or a slide presentation (ask the BLM archaeologist for availability of the slide program).

**COMPANION ACTIVITY:** Time Line - Where Do We Fit In?

**VIDEOS** - *The Early Americans* 40 min.



# SOUTHEASTERN ARIZONA'S PAST

<p>1912 ↑ 1853</p>	<p><b>TERRITORIAL</b></p>	
<p>1853 ↑ 1500s</p>	<p><b>MEXICAN SPANISH COLONIAL</b></p>	
<p>1886 ↑ 1600s</p>	<p><b>APACHE</b></p>	
<p>A.D. 1400 ↑ A.D. 1250</p>	<p><b>SALADO</b></p>	
<p>A.D. 1400 ↑ 300 B.C.</p>	<p><b>HOHOKAM MOGOLLON</b></p>	
<p>300 B.C. ↑ 9000 B.C.</p>	<p><b>COCHISE</b></p>	
<p>9000 B.C. ↑ 9500 B.C.</p>	<p><b>PALEO-INDIAN</b></p>	

# OUTLINE OF ARIZONA HISTORY

## I. Man in North America

- A. Came from northeast Asia over the Bering Strait
- B. Probably first arrived between 20,000 and 70,000 years ago
- C. Was the modern species, Homo sapiens sapiens
- D. Hunted animals that roamed across the land bridges from Asia: bison, mammoth, caribou, horses, camels

## II. Paleo-Indian (Clovis Culture)

- A. 9500 to 9000 B.C. at end of the last ice age
- B. Lived in small nomadic groups
- C. Hunted with spears tipped with large stone points
- D. Made no pottery, raised no crops

## III. Cochise Culture (Archaic)

- A. 9000 B.C. to 300 B.C.
- B. Lived in small semi-nomadic groups
- C. Hunted deer, rabbits, and other small animals that are alive today
- D. Hunted with dart tipped spears and spear thrower (atlatl)
- E. Collected many types of seeds and other plants requiring grinding

## IV. Mogollon

- A. 300 B.C. to A.D. 1200
- B. Descended from Cochise Culture and has regional branches
  - 1. San Simon Branch
  - 2. Mimbres Branch
  - 3. East-central Arizona/west-central New Mexico
- C. Constructed earth covered pithouses
- D. Made and used pottery
- E. Grew corn, beans, and squash
- F. Used the bow and arrow, had shell jewelry, fur and feather blankets

## Hohokam

- A. 300 B.C. to A.D. 1400
- B. Believed to have arrived from Mexico
- C. Used canal irrigation to grow corn, beans, pumpkins and cotton
- D. Cremated their dead
- E. Sophisticated culture similar to Mexico
  - 1. Ball courts
  - 2. Platform mounds
  - 3. Sculpture
  - 4. Copper bells
  - 5. Shell jewelry
  - 6. Macaws for feathers



**V. Salado Culture**

- A. A.D. 1250 to A.D. 1400
- B. Originated in Molollon area and moved into Hohokam area
- C. Adopted Anasazi Culture traits
- D. Built pueblos of up to 200 rooms of adobe and rock
- E. Pueblos enclosed within thick protective walls
- F. Made polychrome (red, black, and white) decorated pottery
- G. Grew corn, beans, cotton, squash, and gourds in extensive areas of gridded gardens

**VI Apache**

- A. Arrived from northern Canada sometime after A.D. 1600
- B. Lived a nomadic/raiding lifestyle
- C. Built brush-covered houses called Wickiups
- D. Had horses and guns after arrival of Spanish
- E. Geronimo surrendered in 1886 and Apaches moved to Florida

**VII Spanish Colonial/Mexican Period**

- A. Began with Spanish exploration in 1500s (Cabeza de Vaca, Franciscan friar Marcos de Niza, Coronado)
  - Introduced horses and metal tools to Indian cultures
- B. Father Kino established a mission system in Arizona
- C. Arizona under control of Mexico until Gadsden Purchase in 1853

**VIII Arizona Territorial Period 1853 to 1912**

- A. Fur trappers were the first Anglo-Europeans in Arizona in 1820s
- B. U.S. military in 1840s south routes to California
- C. Explorers and surveyors in 1850s
- D. Gold rush 1849 to 1864
- E. Mining, ranching, farming settlements 1870s to 1900
- F. Arizona statehood 1912

## VOCABULARY

**absolute dating** - analysis that determines the approximate date that an artifact or feature was used

**A.D.** - anno Domini, since Christ was born

**adobe** - dried mud used for building

**anthropology** - the study of man

**archaeology** - the branch of anthropology that is concerned with the scientific study of remains of past human life

**archaic** - that period of time when hunting and gathering was the primary lifestyle

**archaeomagnetic dating** - a way of determining when clay was last heated to a high temperature

**artifact** - any object made, used, or modified by people

**atlatl** - a grooved stick used for throwing a dart or spear with more force than with one's arm alone

**basalt** - black fine-grained volcanic rock used by ancient people for making tools

**B.C.** - before Christ

**carbon dating** - (also known as radiocarbon dating) the technique based upon measuring the decay of the radioactive isotope of Carbon 14 to stable nitrogen

**ceramics** - another name for pottery

**chert** - very fine-grained quartz used by ancient people for making tools

**chronology** - an arrangement (of cultures or sites) based on their order of occurrence

**Clovis point** - large spear points made and used by people 11,000 years ago to kill mammoth, horses, and camels



**Cochise Culture** - a hunting and gathering culture, without pottery or permanent houses that lived in southeast Arizona from 8000 B.C. to 300 B.C.

**context** - the interrelated conditions in which a site, artifact, or feature occurs

**culture** - all the rules, beliefs, and thinking that a group of people have (culture is passed on from adults to children) also, an arbitrary term that archaeologists assign to prehistoric people who lived in a designated area at approximately the same time, and whose sites and artifacts are similar

**dendrochronology** - a technique for finding out the age of wood based on the variation in a tree's annual growth rings

**excavation** - the study of an archaeological site by carefully digging the layers of earth

**feature** - cultural remains more complex than a single artifact (such as houses, storage pits fire hearths, burials, or cooking pits)

**flakes** - pieces of stone

**function** - the way something was used; its purpose

**geology** - a science dealing with the earth's history as recorded in rocks

**grid** - a network of uniformly spaced lines that divide a site into equal squares

**hearth** - a fire pit

**historic archaeology** - the study of sites that date to the years after Europeans arrived in America

**Hohokam** - people believed to have entered Arizona from Mexico who farmed the Gila and Salt River Valleys

**hypothesis** - a statement, not necessarily true, that can be further investigated

**lithic** - an artifact made of stone

**mano** - a hand stone, used with a metate for grinding

**metate** - a flat or basin-shaped rock used for grinding



**Mogollon** - people descended from the Cochise Archaic Culture who built houses, made pottery, and farmed for a living

**obsidian** - volcanic glass used by ancient people for very sharp tools

**preservation** - keeping from injury or destruction

**projectile point** - a sharpened piece of stone or metal used on the tip of a spear, dart, or arrow

**pueblo** - a village

**relative dating** - a process of comparing the age of an artifact, site, or culture by saying that it is older, younger, or the same age as another one; this method does not give an age in calendar years

**screening** - sifting excavated soil through 1/4 inch wire screen to catch small remains

**sherd** - a piece of broken pottery

**site** - any place that has remains of past human activity

**stratigraphy** - a sequence of strata, or layers, in undisturbed locations with younger levels above the older ones

**stratum** - one distinct layer of earth

**temper** - sand, shell, or rock, added to clay to make pottery

**test pit** - a hole dug in an archaeological site to determine the character of buried remains

**thermoluminescence** - a technique used to find out when pottery was made, based on the light the pottery gives off when it is heated

**topographic map** - a detailed map that shows natural and man-made features such as hills, rivers, roads, and buildings

# ARIZONA HISTORY

## PALEO-INDIAN

The precise date of human entry into North America is still unknown. Some archaeologists believe it could be as long as 70,000 years ago. This time would be prior to the beginning of the last glacial period, the Wisconsin.

The earliest undisputed evidence for man in North America is called Clovis Culture. In Arizona, Clovis materials have been consistently dated to the period between 9000 and 9500 years before Christ. Distinctive Clovis spear points were used by Clovis people to kill mammoth, horses, camels, bison, tapir, and sloth.

The San Pedro Valley in southeast Arizona has a large percentage of all the sites attributed to Clovis Culture.

Exhibits of Clovis Culture materials can be seen at Eastern Arizona College and the Arizona State Museum.

Paleo-Indian artifacts are sometimes found in caves indicating that people used these for shelter. An important site of this type is Ventana Cave, on the Tohono O'odham Reservation. Here, many levels of artifacts were found covering thousands of years. These artifacts show the gradual changes in style and types of tools that indicate a changing adaptation to the environment. (These artifacts are also exhibited in the Arizona State Museum.)

## THE ARCHAIC PERIOD

The culture in southeast Arizona in Archaic times is called the Cochise Desert Culture. Sites from the Archaic period are more common than those of earlier times. They can be found in a range of environments - rock shelters, canyon bottoms, highland areas, and sand dune areas. This indicates the change in lifestyle to one of gathering a wide range of plant resources as well as hunting.

A number of new tools and implements were developed during this period to allow changing adaptations to the environment. The spear thrower, or atlatl, is now used to propel a shorter, lighter dart, tipped with projectile points smaller than Clovis points, but larger than arrow heads. Baskets were made to gather and store plant foods. Grinding tools, such as mortars and round basin metates, are common artifacts on Cochise sites, and were used to grind wild plant seeds and some corn.

# CHANGING LIFESTYLES

## FOOD SOURCES

MOSTLY ANIMALS

MOSTLY PLANTS

PALEO-INDIAN



ARCHAIC



MOGOLLON





Corn is known in the Southwest from Bat Cave levels dated to 3500 B.C. This plant was not readily adopted until around 300 B.C. Why people turned to agriculture is still an unanswered question. By the time corn was being grown, beans and squash had also been domesticated.

Around the year A.D. 1, pottery, and houses more substantial than previously constructed, signal a major change in lifestyle from a wandering/gathering one to a more settled one. This is the beginning of the major Southwest culture traditions of Mogollon, Hohokam, Anasazi, and Patayan (see culture area map).

## **MOGOLLON**

The Mogollon Culture occupied a large area extending from east-central Arizona and west-central New Mexico south into Mexico and is described with regional variations. Locally, Mogollon Culture is called San Simon Branch, named after the San Simon Valley. Transition from Cochise Desert Culture to settled Mogollon is recognized in the San Simon Valley with the introduction of villages and ceramics. The appearance of settled villages in the San Simon Valley marks one of the earliest appearances of the distinctive culture of the Southwest.

Artifacts associated with San Simon Branch Mogollon culture are a continuation of previous Cochise materials with the addition of ceramics. As time progresses, the assemblage includes basin and trough metates, manos, three-quarter grooved mauls, baskets, yucca sandals, bows and arrows, bone needles and awls, and shell jewelry.

Ceramics at first are plain brown wares, transitioning to more sophisticated redwares, polished brownwares, and eventually decorated wares with designs painted in red on well-made polished brown pottery.

Houses at first are small oval to round-shaped dwellings made of poles and sticks covered with mud over a shallow depression. Through time, their size becomes larger and the shape changes to more rectangular. A major difference of San Simon Branch Mogollon villages is the lack of ceremonial chambers associated with other branches to the north and east.

Agriculture concentrates on the corn, beans, and squash complex but wild plants of many types are also collected. Protein is supplied by meat from deer, mountain sheep, rabbits, birds, fish, etc.

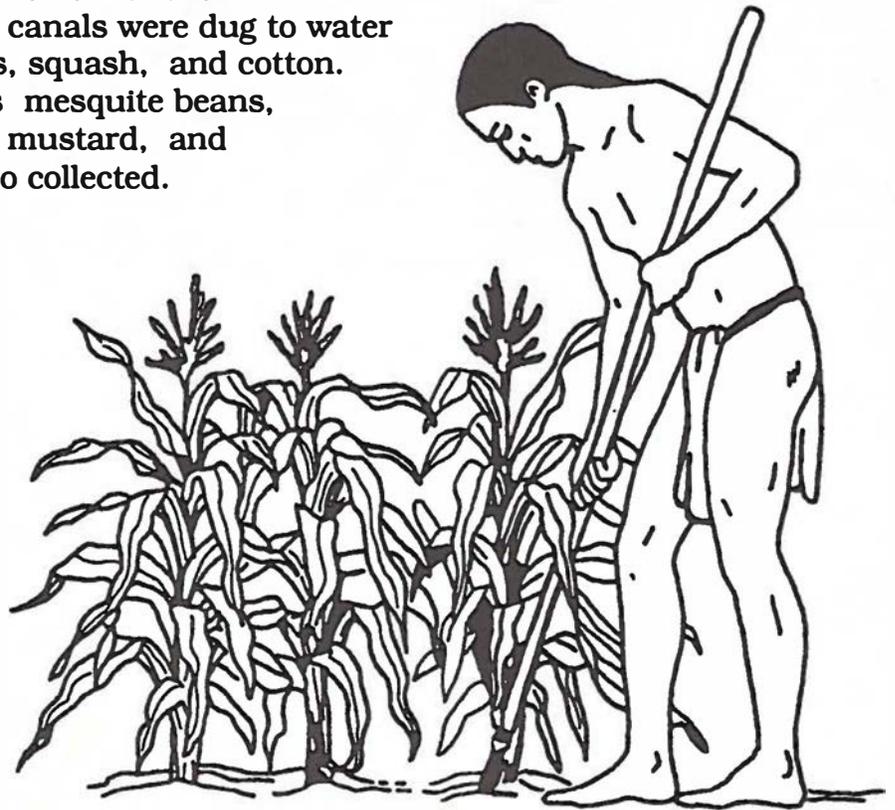
# HOHOKAM

Coincident with Mogollon Culture development is that of the Hohokam. The Hohokam are believed to have arrived in Arizona from Mexico around the year 200 B.C., settling in the Gila-Salt River basin in the general area of modern-day Phoenix. Hohokam influence in the Safford area indicates that this area is at the edge of Hohokam expansion.

The best known and most studied Hohokam site is that of Snaketown near Phoenix. Emil Haury, the archaeologist that investigated Snaketown, concluded a mesoamerican origin for this culture based upon a cluster of cultural traits with no apparent local origin. These traits include a well-developed ceramics complex, figurines, cremation of the dead, canal irrigation, trough metates, stone sculpture, cast metal bells, and a well-developed shell jewelry industry.

Houses are constructed of mud over pole frame structures and differ from Mogollon houses in that they are built in a pit, not utilizing the pit wall as part of the house. Over time, Hohokam houses transition from large square units to smaller, more rounded ones. Near the end of Hohokam occupation (A.D. 1300), the houses were joined together as pueblos and settlements were enclosed with compound walls.

Success at farming was a Hohokam trait. Extensive irrigation canals were dug to water fields of corn, beans, squash, and cotton. Wild plants such as mesquite beans, cactus fruits, tansy mustard, and chenopods were also collected.



## SALADO

The Salado occupation of southern Arizona is not well understood and still the topic of debate by archaeologists. Some believe that the origins for the Salado are present in the Mogollon Rim - Little Colorado area since A.D. 700, and A.D. 900 in the Globe - Miami area. Others believe that the Salado represent an influx of people from Casas Grandes in Mexico into Arizona. Regardless of the precise location the Salado came from, this culture appear to represent an amalgamation of traits from the Anasazi, Mogollon and Hohokam.

Sudden widespread appearance of the culture after A.D. 1250, often superimposed over earlier pithouse villages, is cited as evidence for a Salado migration rather than an indigenous development.

Characteristic of the Salado Culture is polychrome pottery, and above-ground contiguous-walled adobe rooms enclosed within a compound wall. Plazas contain features such as ramadas; conical, below-ground earth ovens; storage pits; caliche mixing pits for plastering; and mortuary areas.

Artifacts include the three-quarter grooved axe, mescal knives, full trough metates, shell and stone ornaments, small triangular arrow points, and other items typical of Hohokam and Mogollon use.

Mortuary practices include both cremation and inhumation.

Salado remains are associated with extensive agricultural features. Fields are typically on terraces above the valley floodplains. Fields are marked by cleared areas, linear borders of rocks, rock piles, check dams, and distinctive gridded garden features.

Crops grown reflect those typical of the southwestern traditions and include corn, beans, squash, gourds, and cotton.

The onset of an increasingly dry weather pattern is believed at least partly responsible for abandonment of the area by Salado people by A.D. 1400.



## APACHE

The Apache are best known from the late 19th-century period because of the well-published conflict with the U.S. Army and settlers. Occupation by the Apache was much earlier, however, and it is possible that their arrival dates prior to the 1600s.

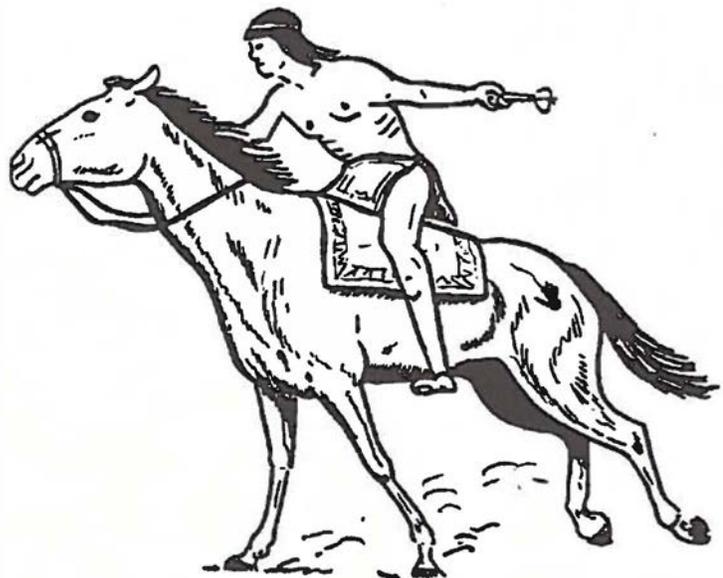
The Apache are related to Athapaskans, in Alaska and northern Canada and are believed to have moved south into the western U.S. quite rapidly.

Navajos are also related to the Athapaskans and recent excavations in northwest New Mexico have revealed much earlier dates for Navajo arrival there than previously thought possible. Dates in the 1300s are being found. Currently, there is no firm evidence that would have us conclude that the Apache were in Arizona earlier than the 1600s.

Apache sites are rare. This does not mean that there may not be very many of them, but more likely that we have not learned how to see them yet.

Apache lifestyle was a nomadic one, except during spring planting and fall harvest. Remains of Apache sites easily recognized have distinctive unsophisticated ceramics and stone circles believed to be tipi rings. Enough Apache sites have not been investigated to allow generalization about artifact assemblages.

Apache resistance and opposition to encroaching settlers led to the well-known hostilities. Cochise, and later Geronimo, fought valiantly to repel the various groups that would have their land, but they were eventually suppressed and relocated to reservations.



# SPANISH/MEXICAN

## Spanish

Spanish activities in southeast Arizona focused on exploration and conquest.

In 1539, the Franciscan Friar Marcos de Niza began his expedition from Sinaloa, Mexico, moving north in search of the legendary Seven Cities of Cibola. These cities were never found and the Spanish were disappointed that the Indians they encountered did not measure wealth in gold and silver.

Coronado again tried to find the wealth purported to be present. In 1540, Coronado travelled down the San Pedro Valley, crossed the Gila near Safford, and proceeded north through Zuni, in New Mexico, and eventually reached Kansas. No gold!

Archaeological remains of this period are difficult to locate because of the briefness of the expeditions and the fact that exploring parties are always on the move.

The Presidio Santa Cruz de Terrenate in the San Pedro valley lasts as a fleeting remnant of Spanish rule (refer to Science in Progress: Discovering the Past at Santa Cruz, in the appendix). Isolation of the Presidio and hostilities with Indians eventually resulted in abandonment of this outpost.

Father Eusebio Francisco Kino was a well known person that established the mission system in Arizona. While Father Kino's concern was primarily the Christianizing of the native populations, he also provides us with much of what we know about the people and lifestyle of southeast Arizona during this time period.

Father Kino made maps and wrote journals about the people. Kino's information is one of the earliest historical identifications of the Apaches, who are recognized as present in the 1600s.

## Mexican

This period could well be called one of transition. Southeast Arizona never really experienced a Mexican identity because of its remoteness and sparse population.

Culturally, this period was one of transition from Spanish to Anglo-American control.

During the Mexican period, the Anglo-American frontier spread into southern Arizona. This vanguard to United States territorial years consisted of mountain men, trappers, and bounty hunters. From 1824 to 1828, James Pattie trapped along the Gila and the lower San Pedro and San Francisco Rivers. The beaver were trapped out by 1837. In the 1830s, Apache scalps were hunted for bounty in Sonora.

Cultural resources of the Mexican period are indistinguishable from those of Spanish occupation except that they date later in years.

The Spanish/Mexican period ends, for our purposes, with the Gadsden Purchase in 1853. Southern Arizona is now part of the United States.



# TERRITORIAL

The Territorial Period is the best known period of Arizona history. Many documents exist and historically conscious residents trace their cultural roots to this period.

The early territorial period was one of little civil government as settlers moved in to make their homes. The army provided marginal protection, being needed elsewhere for more pressing problems.

The Apaches had not been hostile for quite some time. With the influx of more and more anglos, they became aware that the new groups had the same intentions as the Spanish - to take their territory. Conflict resumed with the ultimate conclusion of Apache pacification and interment on reservations.

The Civil War had little effect on southern Arizona, although sympathy for both sides ran high.

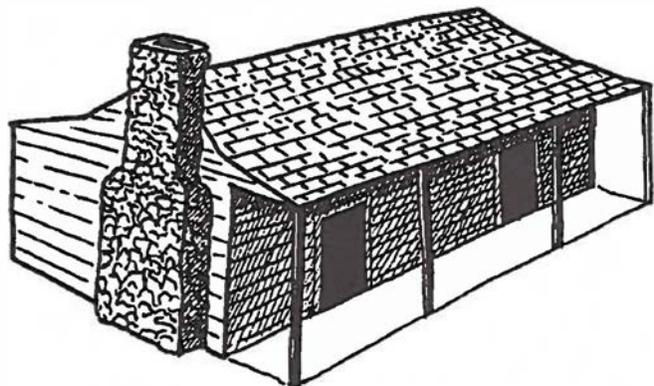
During the 1870s many ranches, mines, and towns were started in southern Arizona.

Mormon colonists spread the American agricultural frontier to Arizona from Utah. A major concentration of Mormon settlement was in the Gila Valley, from Safford to Eden, and in the San Pedro Valley near St. David.

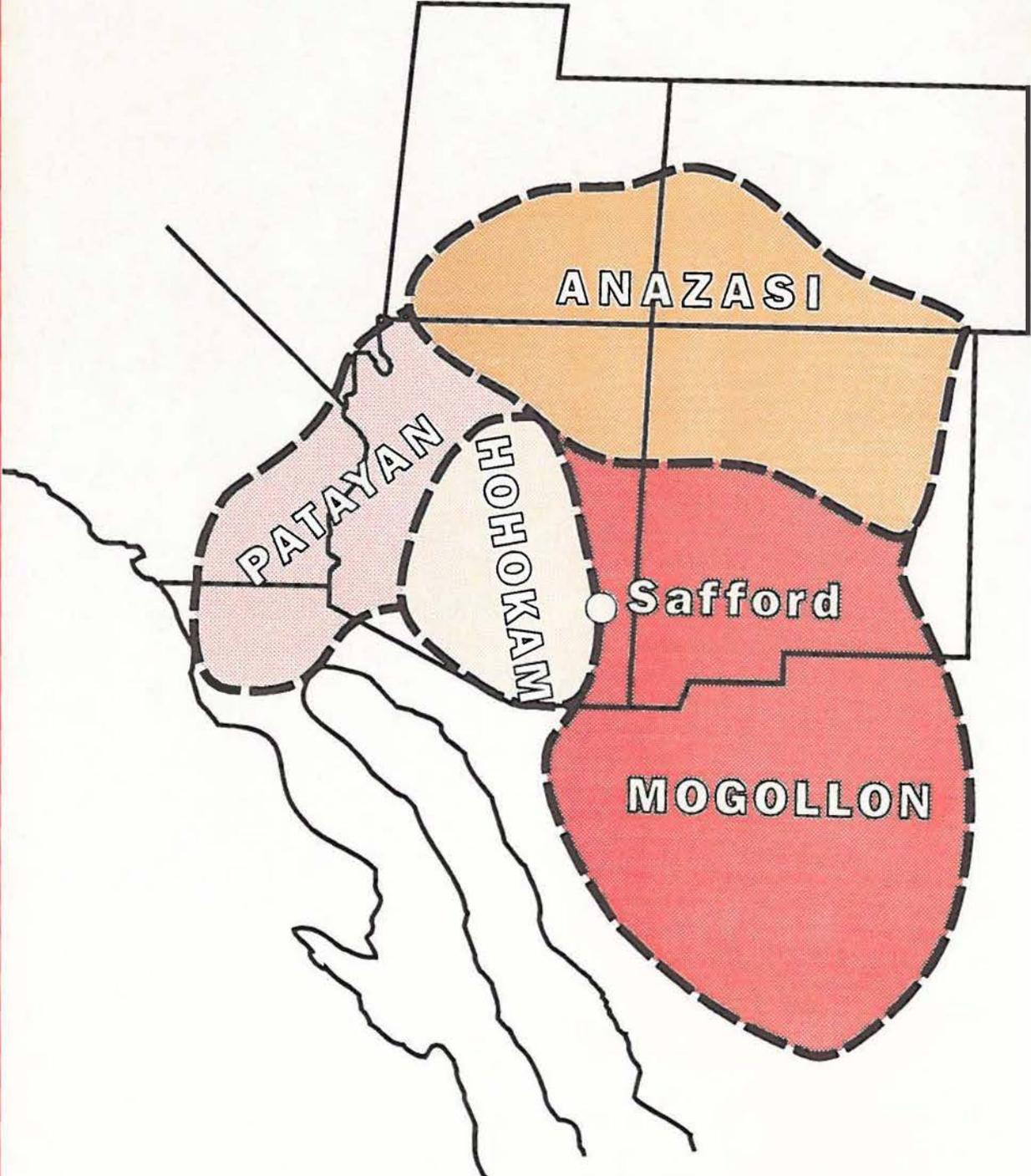
In the latter years of the 19th Century, American population grew so fast that the old Spanish southwest was rapidly turning into a new American settlement. During this time three additional social groups, the blacks, orientals, and European slavs, added to the already heterogeneous population.

In 1912 Arizona became a state.

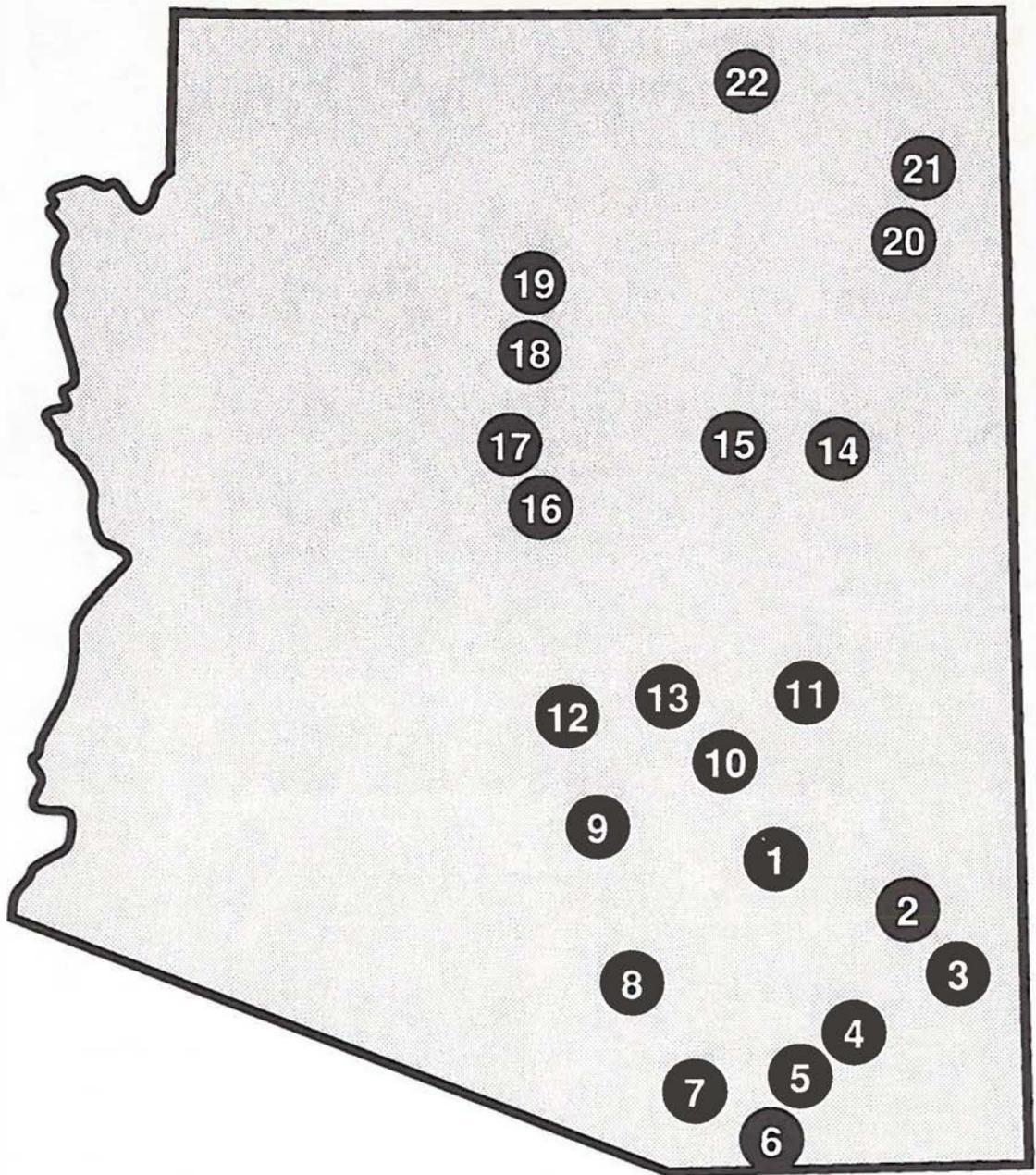
Cultural resources from the Territorial Period include ghost towns associated with mines, farms, ranches, military posts, and stage routes.



# PREHISTORIC CULTURE AREAS OF THE SOUTHWEST



# PLACES TO VISIT IN ARIZONA



1. Turkey Creek Ruin
2. Eastern Arizona College Museum
3. Fort Bowie
4. Amerind Foundation
5. Santa Cruz de Terrenate
6. Coronado National Memorial
7. Tumacacori
8. Arizona State Museum
9. Casa Grande
10. Besh Ba Gowah
11. Kinishba
12. Park of the Canals
13. Tonto National Monument
14. Petrified Forest
15. Homolovi
16. Montezuma's Castle
17. Tuzigoot
18. Walnut Canyon
19. Wupatki
20. Hubbel Trading Post
21. Canyon de Chelly
22. Navajo National Monument



## PLACES TO VISIT IN ARIZONA

1. **Turkey Creek Ruin** - BLM stabilized Salado-period ruin. Located in Turkey Creek near the east entrance to Aravaipa Canyon Wilderness. Take Klondyke Road south from Hwy. 70 to Aravaipa Wilderness parking area. Turn south up Turkey Creek. Call the BLM at 428-4040 for information.
2. **Eastern Arizona College Museum** - Exhibits of local southwest Indian cultures. Extensive collection of pottery from sites in the Gila Valley near Safford. Call Eastern Arizona College for details and hours, 428-8310.
3. **Fort Bowie National Historic Site** - Located south from Bowie in Chiricahua Mountains. This fort served to provide protection for settlers and traffic along the Butterfield State Route. Call the National Park Service for more information, 847-2500.
4. **Amerind Foundation** - Located in Dragoon. Take Dragoon exit off Interstate 10. The museum maintains a collection of artifacts and provides information on Southwestern Indian Cultures from prehistoric time to present. For information call the museum at 586-3666.
5. **Santa Cruz de Terrcnate** - This presidio was built by the Spanish in 1775 and served to provide protection for missions, settlers, and Christianized Native Americans on the Spanish frontier. Managed by the BLM, San Pedro Riparian National Conservation Area Office, Fairbank, AZ. Call 457-2265 for more information and directions.
6. **Coronado National Memorial** - Located along the border of Arizona and Mexico near Hereford. This is a historical park in an out of the way place, ideal for exploring. For more information, write the superintendant, Star Route, Hereford, AZ.
7. **Tumacacori National Monument** - the road to Nogales and very easy to reach. It is a Spanish mission similar to San Xavier, although it is not in use today. Call 398-2341 for information.
8. **Arizona State Museum (University of Arizona, Tucson)** - Offers ongoing and special activities and exhibits on the natural, environmental and cultural history of the Southwest with the emphasis on the archaeology and ethnology of Arizona. The museum can be reached at 621-6302.

- 
9. **Casa Grande Ruins National Monument** - These ruins consist of a four-story structure dated from A.D. 900 to 1450, and constructed by Hohokam Indians. Located approximately midway between Tucson and Phoenix on AZ Hwy 87. Call the Monument at 723-3172.
  10. **Besh Ba Gowah Archaeological Park** - Salado Pueblo ruins occupied from A.D. 1225 to A.D. 1400. Located in the city of Globe, the facility has a museum and partially reconstructed ruins to view. Call the museum at 425-0320.
  11. **Kinishba Ruins** - Kinishba is a pueblo site with over 400 rooms and is one of the largest Mogollon Culture sites in Arizona. The ruins are operated by the Fort Apache Indian Reservation. Located 13 miles from the junction of Hwy 73 and 60 at Carrizo, AZ. For more information call 338-4625.
  12. **Park of the Canals** - Hohokam village ruins and canals network. Also present are exhibits of early Mormon settlers who discovered these canals in the Mesa area. Located at 1710 North Horne Road in Mesa, AZ. Call the City of Mesa at 644-2351.
  13. **Tonto National Monument** - Salado puebloan villages built in natural rockshelters approximately three miles southeast of Roosevelt. For more information, write the National Park Service, P.O. Box 707, Roosevelt, AZ. or call 467-2241.
  14. **Petrified Forest National Park** - Native Americans have placed hundreds of petroglyphs on boulders throughout the park. Puerco Ruin, occupied between A.D. 1200 and 1350, is also open to the public. Contact the park at 524-6228.
  15. **Homolovi Ruins State Park** - The Park contains six pueblos built by the ancestral Hopi Indians. The park is open from 10 am to 2 pm Monday through Friday. 289-4106.
  16. **Montezuma's Castle National Monument** - The park contains numerous Sinagua cliff dwellings and Montezuma's Well, a limestone sinkhole lined with cliff dwellings. Located 2.5 miles from Interstate 17, five miles north of Camp Verde. Call 567-3322.
  17. **Tuzigoot National Monument** - This is a partially restored Sinagua pueblo dated to A.D. 100 - 1450. It was two stories high and had 77 rooms which were entered through the roof. The visitor center is two miles east of Clarkdale. Call 634-5564 for more information.

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- 18. Walnut Canyon National Monument** - Cliff dwellings occupied by Sinagua Indians from A.D. 1120 to 1250, and constructed in sheltered canyon overhangs. To get there travel 7.5 miles east of Flagstaff on Interstate 40 to exit 204. It is three miles to the Park entrance road. For more information, call 526-3367.
  - 19. Wupatki National Monument** - Indians believed to be ancestral Hopis built these pueblos dated to A.D. 1065. Located 15 miles north of Flagstaff on the loop road to Sunset Crater. Call 527-7040 for more information.
  - 20. Hubbel Trading Post National Historic Site** - On the Navajo Reservation. Navajos traded silver jewelry and rugs for what they required at this store. For more information write the Superintendent, Box 388, Ganado, AZ 86505.
  - 21. Canyon de Chelly National Monument** - Includes prehistoric Anasazi cliff dwellings as well as contemporary Navajo settlements, in a deep sandstone canyon setting. Call the National Park Service for more information at 674-5436.
  - 22. Navajo National Monument** - Three well preserved Anasazi cliff dwellings located 22 miles west of Kayenta and north on Route 564 to the Monument. Call the Monument at 672-2366.

A pamphlet, entitled Arizona Archaeological Parks and Sites, is available from the Arizona State Historic Preservation Office. Write to Arizona State Historic Preservation Office, Arizona State Parks, 800 W. Washington, Suite 415, Phoenix, AZ. 85007, or call 542-4009.

# HOW WE KNOW ABOUT ARIZONA'S PAST





# HOW WE KNOW ABOUT ARIZONA'S PAST

This section describes the basic methods of archaeology and lays the foundation for use of the activities, culminating with Discovery at Dankworth Village - Who Was There? and What Did They Do?

Lessons 1 through 5 progressively add to the students' knowledge and prepare them to act as archaeologists and collect their own data for analysis at Dankworth Village.

## **Lesson 1 What Archaeologists Do**

Companion Activity - Capsule America

## **Lesson 2 Archaeological Terms**

Companion Activity - Site in a Bag

## **Lesson 3 Tasks of an Archaeologist**

Task 1 - Locating Sites

Task 2 - Planning What To Do

Task 3 - Collecting Data

Task 4 - Analysis and Explanation of Data

Companion Activity - Grid layout sheet (select the appropriate level of this exercise for the grade being taught)

How Old is This - Dating Using Tree Rings (Dendrochronology)



# LESSON 1

## WHAT ARCHAEOLOGISTS DO

### RATIONALE

This lesson provides an introduction to what archaeologists do and the concept of culture.

### OBJECTIVE

The students will understand that learning about culture can be achieved by examination of the fragmentary remains of the products of human activity.

### PROCEDURE

Ask the students to close their eyes and picture a room in their house. Think about all the things that are in it. Have them make a list of about 10 items from this room which they pictured. Some students may share their list with the class. Ask the students to determine the use of the items, and what they tell about the people who live in the house.

Propose a hypothetical situation. Each student takes the items from the list, digs a hole, and buries them. If these items remain there for 200 years, how will they change? (Consider the effects of heat, cold, rain, insects, etc.) What will be left? Will the items be recognizable? Will the function of different items be apparent?

Two hundred years later these items are discovered. Ask the students what people from that future time would be able to tell about the items, about the lives of the people that made them, about what people did for fun, their habits, their families, etc. What questions about the students might these people from the future wish to answer? What difficulties might they have in doing so?

Explain to the students that this is an example of what an archaeologist does. Review the word culture.

### COMPANION ACTIVITY

Capsule America



## **LESSON 2**

# **ARCHAEOLOGICAL TERMS**

### **RATIONALE**

Students must first be able to differentiate between the types of materials found at cultural sites to begin to understand the methods of archaeology.

### **OBJECTIVE**

Students will learn the following basic terms and use them to classify materials into categories.

- **Artifact** - any object made, used, or modified by man.
- **Feature** - cultural remains more complex than a single artifact such as houses, storage pits, fire hearths, burials, or cooking pits.
- **Natural Materials** - natural objects probably used by humans, such as seeds, shells, bones, or rocks.

### **PROCEDURE**

Review with students the role of an archaeologist as determined in the previous lesson. Point out that the materials which archaeologists work with are classified into three different categories: artifacts, features, and natural objects.

Duplicate and distribute student discussion sheet, "What Might an Archaeologist Find?" Discuss the categories. Point out how the materials are differentiated. Ask students to think of additional items which might be classified into each of the three groups.

Ask the students to recall the items which they pictured from their homes in the previous lesson. How would they classify those items? (Most items may be human-made. If this is the case, ask students what this may indicate about our society.)



Present the collection of sample items to the students. After they have examined them, ask the class to classify these items. This may be done as a class activity or in small groups. If small groups are used, rotate the sample items between each group and have each group report its findings to the class to determine if all groups classified the items in a similar manner. Discuss items on which there may be disagreement.

## **MATERIALS**

- student discussion sheet, "What Might an Archaeologist Find?"
- paper and pencils
- sample artifacts, features, and natural objects (artifacts if you have them, or items from the classroom, home, or pictures may be used)

## **COMPANION ACTIVITY**

Site in a bag

# WHAT MIGHT AN ARCHAEOLOGIST FIND?

## ARTIFACTS

Human made objects such as pots, axes, projectile points, and baskets.



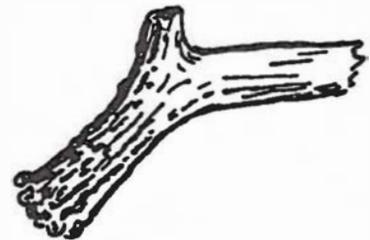
## FEATURES

Culturally produced objects which cannot be removed from the site, such as walls, burials, and fire pits.



## NATURAL MATERIALS

Natural objects probably used by humans, such as seeds, shells, and antler.





## **LESSON 3**

# **TASKS OF AN ARCHAEOLOGIST**

### **RATIONALE**

This lesson introduces the basic components of archaeological work to the students and gives them a more specific view of the individual tasks an archaeologist performs.

### **OBJECTIVE**

The students will learn that archaeology is performed in an orderly manner with each task building upon the previous one.

### **BACKGROUND**

The tasks that an archaeologist performs can be divided into the following jobs:

- Locating sites (2 different ways)
  - Looking
  - Sites are already found and in a data base
- Planning what to do
  - Reading about what we already know
  - Hypothesis and research design
- Collecting data
- Analyzing data
- Explaining what the data means

## LOCATING SITES

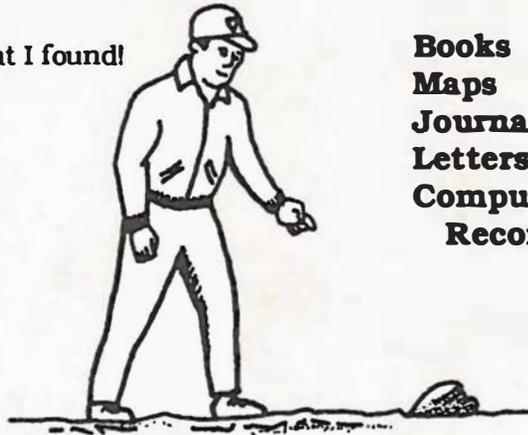
Duplicate and distribute the student discussion sheet "Locating Sites." Review with the students each example of how archaeological sites may be found.

- **Chance** - have the students ever found an arrowhead, and old bottle, or a ruin? These are examples of chance findings. Discuss their experiences.
- **Historical records** - Written material gives clues to site locations. Old maps, journals, letters, and books sometimes give locations of sites very specifically. The maps and writings of Father Kino helps us find the location of sites of the Spanish Colonial Period in southeast Arizona, for example. Discuss the reliability of such sources. Why might it vary considerably?
- **Photos, paintings, drawings** - Photos and illustrations from the past give clues where useful sites may be found. Discuss, for example, what clues we might get from copies of the Graham County Historical Society publications.
- **Personal recollections** - The memories of parents, grand-parents, and old family stories may be quite familiar to many students. These stories can be helpful to the archaeologist. Ask the class what they have heard in their families. Discuss the reliability of such sources.
- **Special techniques** - Other methods of scientific investigation can assist the archaeologist. Magnetometry, infra-red photography, metal detectors, sonar, and electrical conductivity are some of the techniques.
- **Existing data bases** - Federal and State governments require that, before copper mines, highways, new buildings, power lines, pipelines, etc. are constructed, important archaeological sites are not destroyed without study. The Bureau of Land Management, U.S. Forest Service, State of Arizona, and other agencies have data bases that record the location of cultural sites. Not everyone is allowed to see these maps. Why do you think this is?

# LOCATING SITES

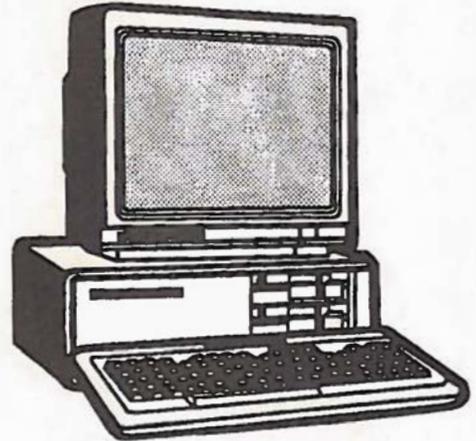
## CHANCE

Look what I found!



## HISTORICAL RECORDS

Books  
Maps  
Journals  
Letters  
Computer  
Records



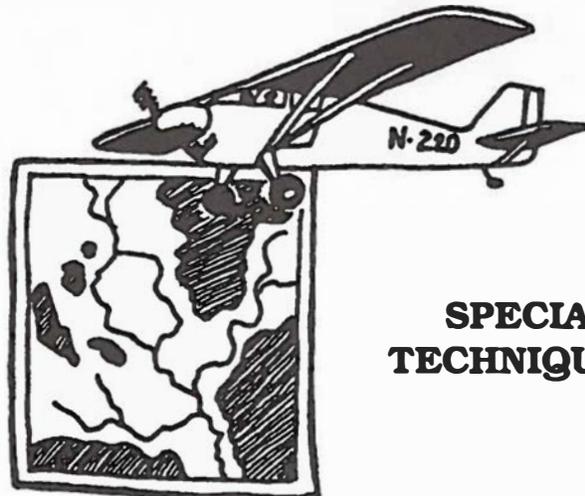
## PHOTOS, PAINTINGS, DRAWINGS



When I was young...



## PERSONAL RECOLLECTIONS



## SPECIAL TECHNIQUES



# PLANNING WHAT TO DO

## Reading About What We Already Know

The point that the students need to understand from this activity is that archaeologists do not need to duplicate research that has already been done. Also, in most instances, published information allows the researcher to refine their ideas so that more meaningful results can be obtained.

### Discussion and Exercises:

- \* Ask the class if any members have read books or journals about archaeological research. If so, have them tell the class about what they read.
- \* Choose published material on one of the local cultures of the Gila Valley. Read to the class about a subject that they want to know about.
- \* Choose topics about one of the local culture groups that you have books or published information on and have individual students make reports to the class about what they find out.
- \* Utilize this task of archaeological work as a research paper topic for the students' English class.

## Hypothesis and Research Design

Responsible archaeological research is never undertaken without first having a question that needs to be answered and a plan developed to recover the information. The question is the HYPOTHESIS and the plan is the RESEARCH DESIGN.

**Hypothesis:** A statement, not necessarily true, that can be further investigated.

Hypotheses can be right or wrong. When you make a hypothesis you make the very best guess that you can and then go on from there.

Review the hypothesis used for the Site in a Bag exercise.

Ask the class to think of some more hypotheses about one of the former cultures that lived in the Gila Valley.



## Research Design

A research design is a fancy way of talking about a plan.

When you do archaeology you need a plan.

When you build a house you use a plan called a blueprint.

When you bake a cake you use a plan called a recipe.

When you make a dress you use a plan called a \_\_\_\_\_.

Can you think of other kinds of plans?

When you \_\_\_\_\_ you use a plan called a \_\_\_\_\_.

# COLLECTING DATA

## NOTE TO TEACHER

Once an archaeologist has decided to investigate a site, two things must first be done. If excavation is planned, it is important to know what undisturbed soil looks like. A control pit is frequently dug away from the site to gather this data. Once we know what the soil looks like in a natural state, we can then recognize changes made by people as the site is dug. A grid is also laid out over the site. The squares of the grid are used as a guide to the location of collected or excavated materials. The grid squares are usually given coordinate numbers according to the four main compass directions. Each grid square is then carefully collected or excavated as a unit. If excavation is being performed, the vertical depth that each item or feature is found is also carefully recorded. Knowing the exact location of artifacts is essential to their later interpretation; once items are removed or destroyed by digging, we cannot put them back.

## ACTIVITY

- Materials**
- student discussion sheet, "Collection of Materials" (choose the appropriate one for grade level)
  - student activity sheet "Grid Activity"
  - metric rulers and pencils

Tell the students that a site has been found. Ask what should be done next. Discuss their suggestions.

Duplicate and distribute student discussion sheet, "Collection of Materials." Introduce the concept of the control pit, and discuss its purpose. Ask the students how it will be useful to compare undisturbed soil with that from the site.

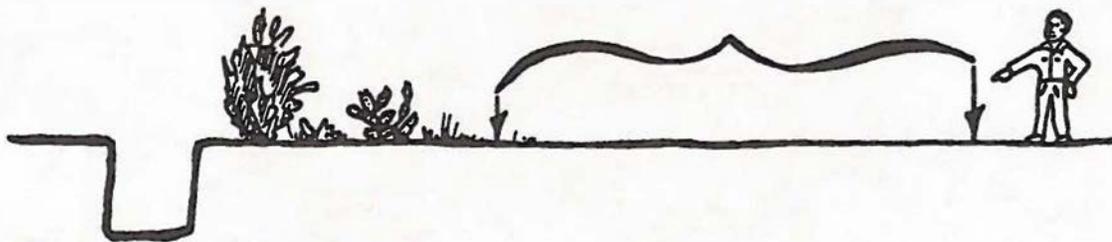
Through discussion, lead students to understand that it is important to know where in the site any material is found. Ask how specific locations might be determined. Introduce the concepts of the grid and vertical depth. Use the chalkboard or overhead projector to explain the gridding procedure. Present the concept of axis lines. Have the students place coordinate numbers on selected grids to help develop the concept.

Duplicate and distribute the student activity sheet, "Grid Activity." This worksheet is designed to provide students with the opportunity to apply archaeological techniques related to the collection of materials. Review the assignment with the class and assist those who need additional help.

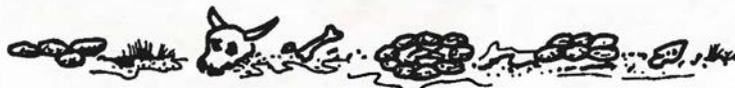
After the students have had time to complete their worksheets, review responses with the class. Ask how a grid might be constructed in the field. Would it be practical to grid an archaeological site in one-centimeter squares? What size might be better.

# COLLECTION OF MATERIALS

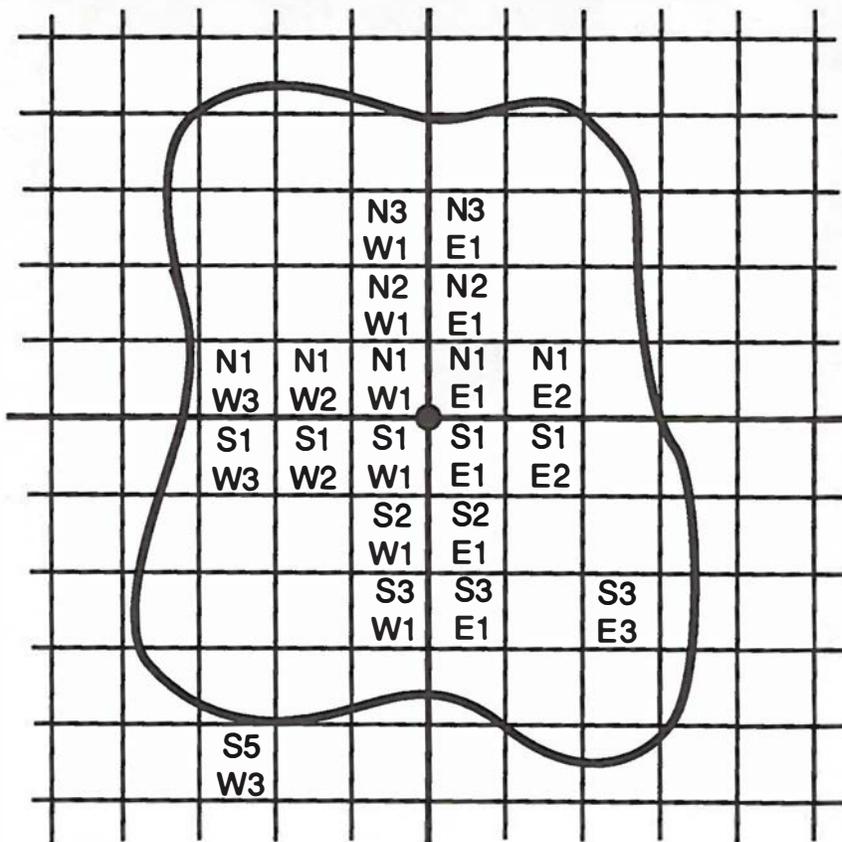
This is the site.



Control pit



Construct a grid



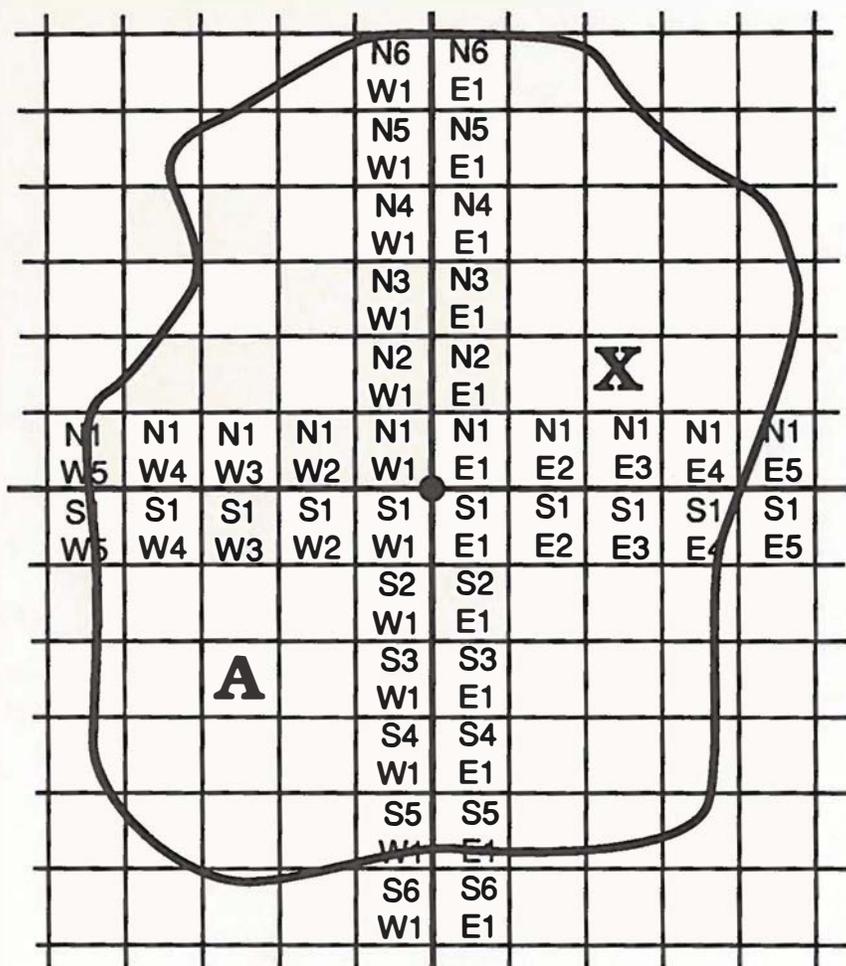
Vertical depth



Level

# GRID ACTIVITY

TEACHER COPY



Control pit  
(may be placed  
anywhere  
outside of  
the site)

1. Construct a grid using one-centimeter squares.
2. Label the grid on each side of both axis lines.
3. Draw a circle where a control pit might be placed. Label it.
4. Three pot fragments were found in S3-W3. Put an A in that square.
5. Below is a list of grid squares. Put an I beside those that are in the site. Put an O beside those that are not in the site.

S4-E3   I  

N3-W4   O  

N6-E4   O  

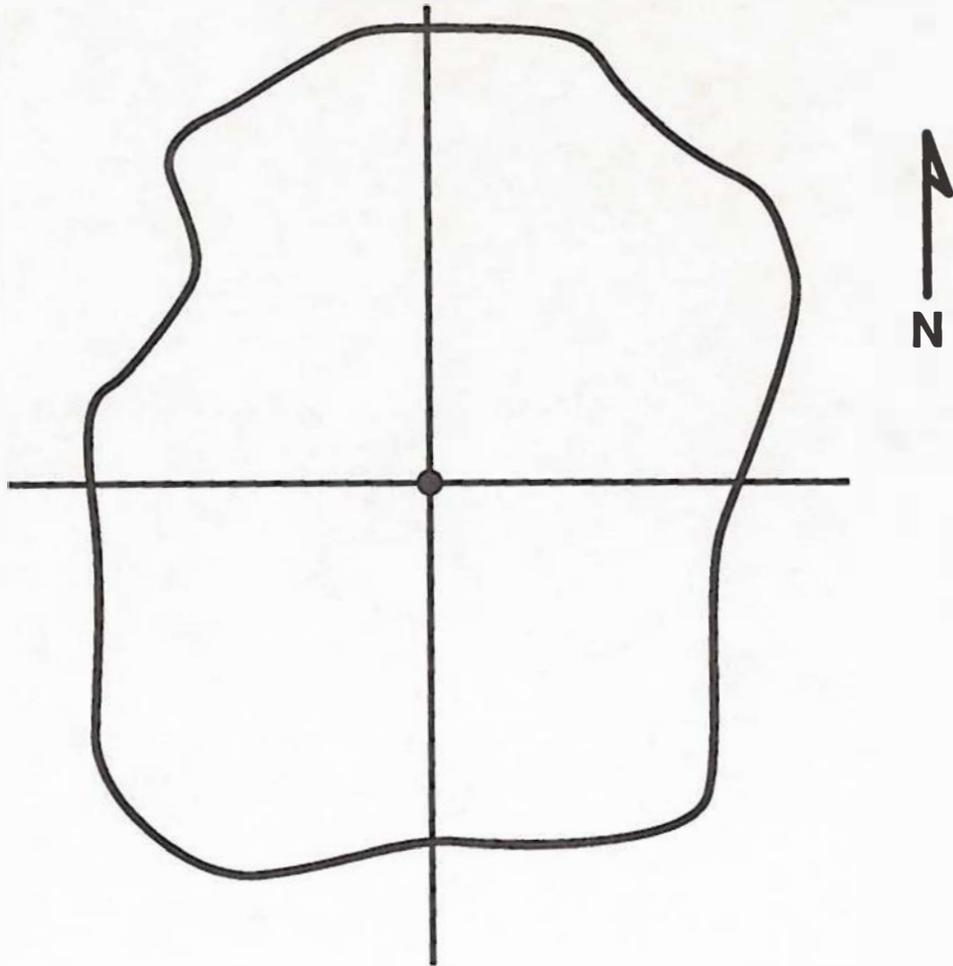
S6-E5   O  

S2-E3   I  

N4-W3   I  

6. Many pieces of burned wood and bones were found in grid square N2-E3. Put an X in this grid square.

## GRID ACTIVITY



1. Construct a grid using one-centimeter squares.
2. Label the grid on each side of both axis lines.
3. Draw a circle where a control pit might be placed. Label it.
4. Three pot fragments were found in S3-W3. Put an A in that square.
5. Below is a list of grid squares. Put an I beside those that are in the site. Put an O beside those that are not in the site.

S4-E3 \_\_\_\_\_

N3-W4 \_\_\_\_\_

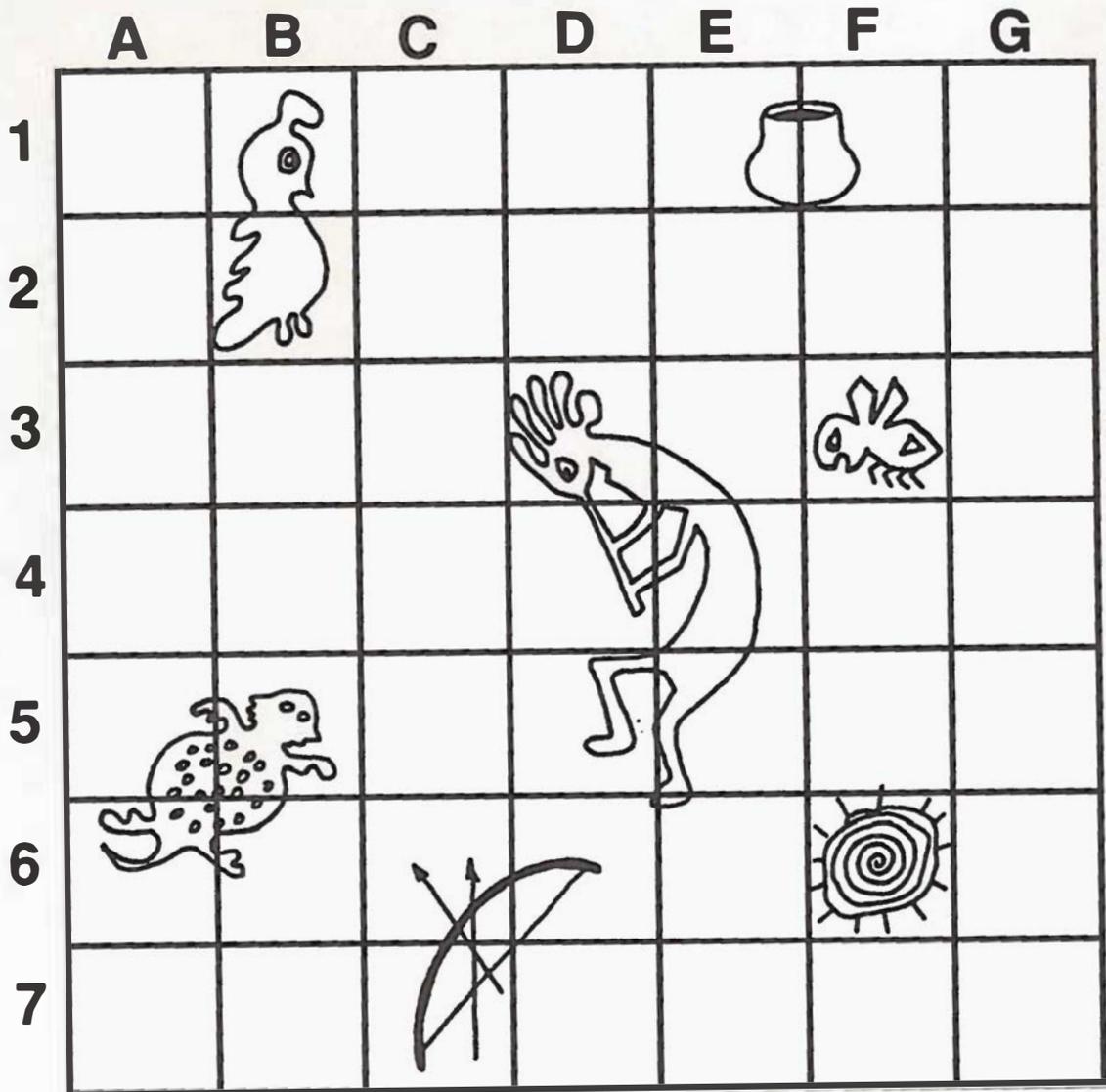
N6-E4 \_\_\_\_\_

S6-E5 \_\_\_\_\_

S2-E3 \_\_\_\_\_

N4-W3 \_\_\_\_\_

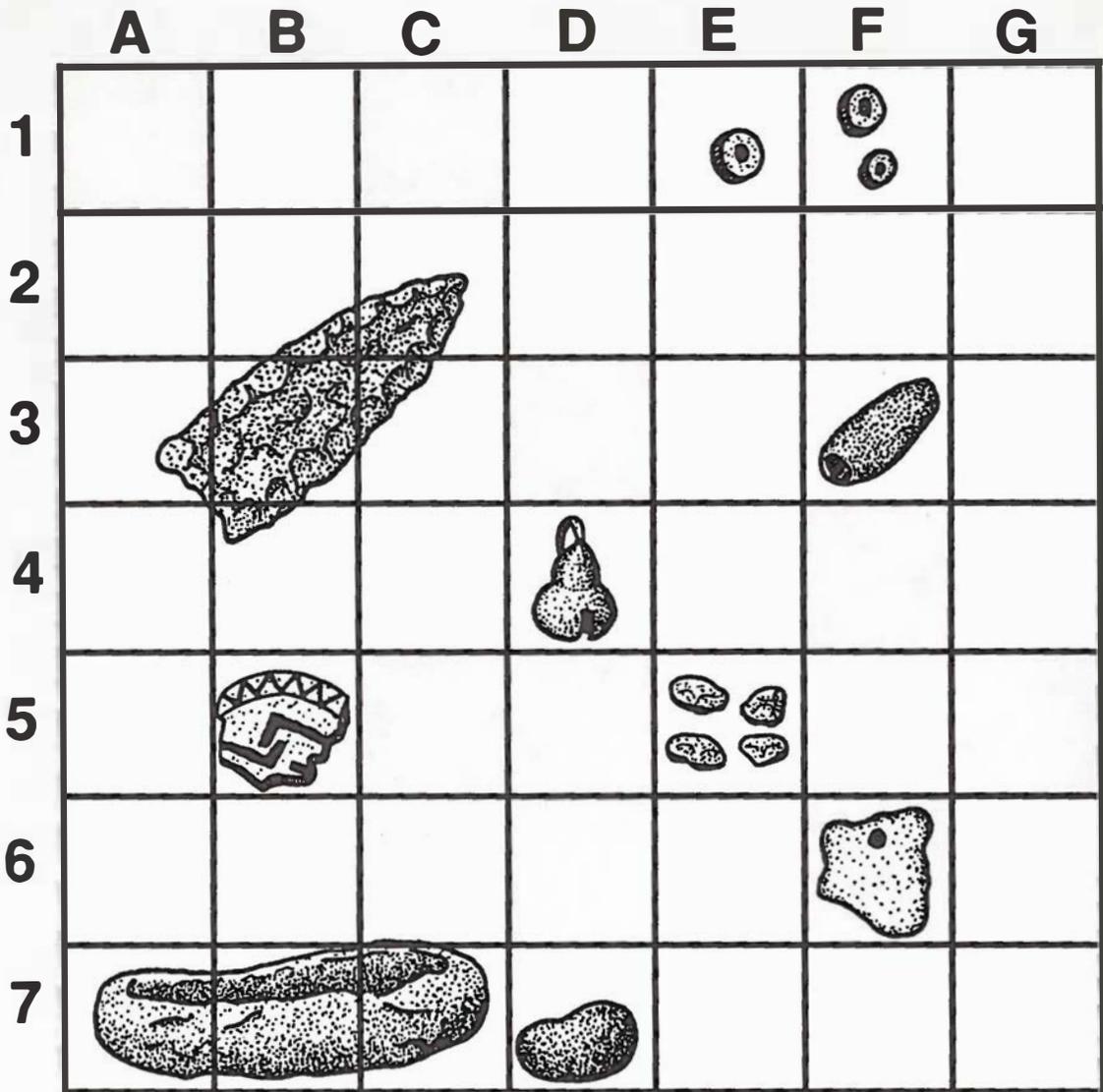
6. Many pieces of burned wood and bones were found in grid square N2-E3. Put an X in this grid square.



**NAME ALL THE GRID SQUARES WHERE ALL THE INDIAN DESIGNS ARE LOCATED**

**Example: The bee F-3**

1. quail \_\_\_\_\_
2. sun \_\_\_\_\_
3. bow and arrows \_\_\_\_\_
4. small pot \_\_\_\_\_
5. horned lizard \_\_\_\_\_
6. flute player \_\_\_\_\_



**NAME ALL THE GRID SQUARES WHERE EACH ARTIFACT IS LOCATED**

**Example: the small bead E-1**

- |                          |                       |
|--------------------------|-----------------------|
| 1. four lithics _____    | 2. pendant _____      |
| 3. pot sherd _____       | 4. metate _____       |
| 5. mano _____            | 6. bell _____         |
| 7. two small beads _____ | 8. tubular bead _____ |
| 9. Clovis point _____    |                       |

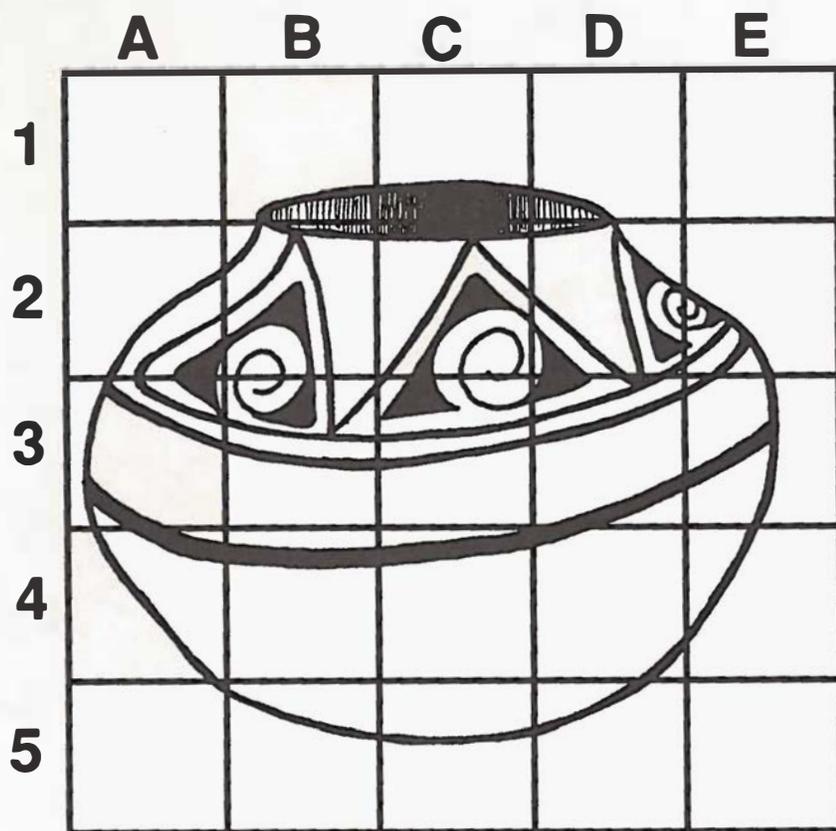


	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							

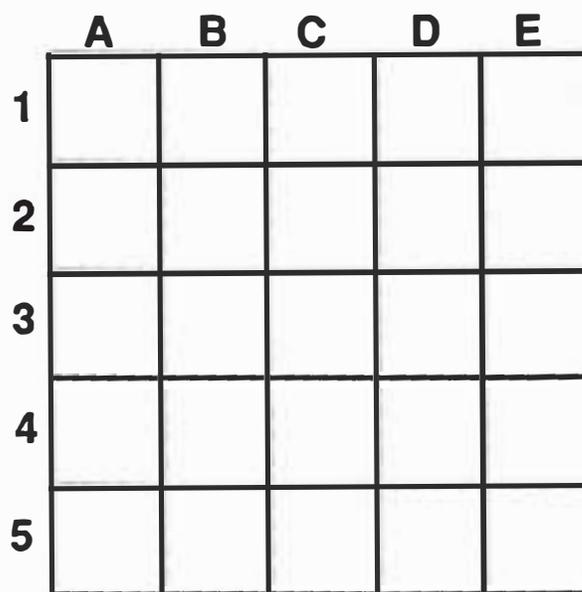
**THIS PAGE IS TRICKY**  
**Use your imagine and draw the artifacts**  
**in the correct grid squares**

**Example: arrowhead 2A & 2B**

1. corncob 1D, 1E, 1F, 1G
2. pot sherd 3D, 3E, 4D, 4E
3. two lithics 4B
4. pot sherd with design 5A, 5B, 6A
5. round bead 7C
6. piece of charcoal 5D, 5E
7. broken spear point, 6E, 6F, 6G, 7E, 7F, 7G



Draw a smaller version of the pot to scale on the graph below. Be sure that you place it in the correct grid square.



## Collecting Data, Continued

**Notes to Teacher** - Dating of archaeological remains is an important aspect of the data collection process. Two kinds of dating are used, Relative and Absolute. Relative dating establishes that one layer, or strata, of a site is older or younger than another. Absolute dating yields dates in years. This is contrasted with relative dating in which materials are said to be older or younger than others, but no specific age of the remains is assigned.

First explain to the students the importance of relative dating. Sometimes archaeologists are unable to use absolute dating techniques (such as radiocarbon dating) in order to get a calendar date for a cultural level. Instead, they will examine the layers of soil from several test pits at one site or several sites within an area. This will establish a correlation and hence allow a statement that one is older or younger than another.

List on the board the strata from three sites (each letter represents a different stratum).

Site 1	Site 2	Site 3
H	C	H
R	R	C

Tell the students to copy these onto their papers and to put these strata in order, with the oldest on the bottom and the youngest on the top. You can also do this with the class on the board. Point out that within each column, the strata are now in order, with the oldest at the bottom and the youngest at the top.

The correct order is shown below:

H  
C  
R

Explain to the students that each "site" above gives unique information about the chronology. Now try "sites" with three strata:

Site 1	Site 2	Site 3
E	G	A
G	A	T
T	T	P

The correct order is:

E  
G  
A  
T  
P



## Absolute Dating

**Notes to Teacher** - This activity gives the students an introduction to the methods of Absolute dating as used to determine the age of sites. Students will demonstrate their understanding of the four types by successfully matching the methods with materials they can date. Absolute dating uses complex laboratory methods to achieve the end results. The following explanations are brief accounts to give the students a basic idea of the four types most commonly used.

**ARCHAEO-MAGNETIC DATING** is a way of determining when fire hearths were used. Most soil contains some clay that is partially iron ore. When clay is heated, the grains of iron ore line up with the magnetic field of the earth. They remain in this position, even after the clay cools. The Earth's magnetic field varies through time, and records of these changes can be compared with the alignment in an archaeological sample to determine when it was heated. This means that, through archaeomagnetic dating, an archaeologist can tell when a prehistoric fireplace was used.

**DENDROCHRONOLOGY (TREE-RING DATING)** is a technique for finding out the age of wood at archaeological sites. Certain trees grow rapidly at one time of the year. When a tree like this is cut down, the annual growth spurts can be seen as rings in the trunk of a tree. The rings are then compared with charts that show patterns of rings from the present time back into prehistory. An expert can tell what year the tree was cut. Ordinarily, it is safe to conclude that the tree was used soon after it was cut.

**RADIOCARBON (CARBON 14)** dating is a method for determining the age of organic remains. This method is based on the principle that all living things contain carbon and a fraction of all carbon is a radioactive type, Carbon 14. All plants and animals absorb Carbon 14 while they are alive. After they die, the radiocarbon decays at a constant rate that can be measured. Although all substances that have been alive (wood, grass, bone, shell) can be radiocarbon dated, the ideal material is wood charcoal. Radiocarbon dating is the most commonly used absolute dating method.

**THERMOLUMINESCENCE** is a way of dating pottery. Clay contains natural radioactive materials in very small quantities. The clay that pottery is made from is heated to high temperature when the pottery is made; this drives out any trapped energy and sets the time clock to zero. After the pottery is made, the radioactive materials continue to accumulate but cannot escape from the pottery. When scientists re-heat the pottery in the laboratory, all the trapped radioactive material escapes as light. By measuring the light, we determine out how long ago the pottery was made.



List the following archaeological materials on the board. Ask the students to decide which absolute dating technique can be used for each sample. More than one technique can sometimes be used.

1. wooden roof beam (tree-ring, radiocarbon)
2. woven grass mat (radiocarbon)
3. pottery bowl (thermoluminescence)
4. prehistoric fireplace that has no charcoal in it (archaeomagnetic)
5. prehistoric fireplace that has large pieces of charcoal and pottery pieces in it (archaeomagnetic dating for the clay around the fireplace, radiocarbon and possibly tree-ring for the burned wood, and thermoluminescence for the pieces of pottery)

Discuss why an archaeologist might want to use several dating methods at the same time. Each method has a certain margin of error. If more than one technique is used to determine the age of a single feature, the date will more likely be accurate. In addition, the archaeologist will need to use different methods for different remains found at the site.

### **COMPANION ACTIVITY**

How old is this?  
Discovery at Dankworth Village

# ANALYSIS AND EXPLANATION

## Analysis

After collecting data in the field our job is only partially done. Analysis in the laboratory is generally believed to take anywhere from two to six times as long as field work! The first job is to organize the artifacts and samples we collected. To do this we classify, or make lists, and put all the artifacts of one kind together. When there are many different kinds of pottery, for example, we then make more lists until we have all of each type together: brownware, decorated wares, and then brownware bowls, decorated jars, dippers, etc.

To help visualize this, have the students think of a grocery store. The store is full of food, but each different category is separate. Dairy products are all in the same place, but milk, cheese, yogurt, butter, etc. are separated into their own sections. Ask the students to give examples of different kinds of classifications.

Once the students understand classification, use an artifact kit and classify (make lists of) the various items. Do this as a class, perhaps in an informal circle of students. Show the items to the class one at a time. Section the chalkboard off as the students identify each item. Have a student record the data. Proceed until all items are in a category. Add up the items in each list.

Then, ask the class the following questions:

Why are there more items in one category than another?

Can we tell how old the people were that used these artifacts?

Were the people male or female?

What did the people do at this site with the artifacts and other items?

How old is the site?

Can we answer our hypothesis?



## **Explanation**

First, we have to draw conclusions. This means looking at the lists on the chalkboard and deciding on answers to the questions. When we have what we think are the answers, we tell others what we found out.

Have someone volunteer to tell the class what the answers to the questions are and what they conclude about this exercise.

Archaeologists tell others about their work at meetings, or write scientific papers, or sometimes write books.

# ACTIVITIES



# CAPSULE OF AMERICA

## RATIONALE

This activity provides an opportunity for students: (1) to learn what an artifact is, (2) to think about American culture through artifacts, and (3) to improve group interaction skills.

## OBJECTIVE

During this activity, students will list 20 artifacts that represent American culture.

## PROCEDURE

Students are to pretend they have been chosen to select objects to send to a distant place where nothing is known about America. The class as a whole will eventually decide on 20 artifacts that will portray our life.

1. Discuss the meaning of "artifact" and what an artifact can show about the people who use it. An artifact is any object made, used, or modified by people. Artifacts indicate how advanced the maker's technology is and can give information about the values and practices in the society.
2. Divide the class into four groups. Have each group cut out pictures of 10 artifacts to send to a distant place. (New Guinea? another planet?) that represent American life. Each group should list the artifacts and what they tell about our life.
3. Bring the groups together and have each group show their pictures and read their list of artifacts and reasons. Have the class decide on a list of the 20 artifacts that tell the most.
4. Lead a group discussion about the list. What is the impression portrayed of American life based on the artifacts? What things are missing or misrepresented?

## MATERIALS

paper and pencils  
scissors  
old catalogs (for pictures of American artifacts)

# SITE IN A BAG

## RATIONALE

This activity: (1) Helps students understand the importance of artifact context, (2) improves skills of analysis, conclusion drawing and communications, and (3) illustrates how archaeologists learn about people from artifacts.

## INTRODUCTION

Archaeologists try to piece together how people lived from the things they left behind. They never find everything. What they do find are fragments of the whole puzzle. Artifacts that are found are carefully recorded in context, then described in detail. Initially this is done without implying artifact use. How people lived and who they were is then carefully reconstructed from this primary data.

In this exercise, students look at familiar "artifacts" out of context and try to figure out who the artifacts describe.

This is a good introduction to archaeological methodology and the problem caused by removing artifacts from context. See if your students can match classmates to "artifacts."

## VOCABULARY

archaeologist/archaeology  
artifact  
context  
data  
hypothesis

## PROCEDURE

Each student collects 5-10 items from home that they feel describe themselves, but are not obvious. Stress that there should be no names, telephone numbers, or photographs that would easily give their identity away.

Discuss with students the way an archaeologist studies a site. The first thing done is to prepare a research design based upon a hypothesis. Explain that research designs can be simple or complex plans and use the analogies of blueprints guiding house construction, patterns used for sewing, recipes used for cooking, road maps guiding long trips, etc.



A great deal of information can be determined from careful excavation. When archaeologists excavate a site, they photograph or draw soil changes and artifacts as these are uncovered. After artifacts are removed from the ground, they are labeled with information that shows where they were found. These steps assure that an archaeologist can tell the context of artifacts (where they are found and how the artifacts related to each other). An archaeologist can tell much more about a group of people if he or she can analyze a collection of artifacts found together rather than a single artifact with no known context.

Illustrate this point by holding up a pencil and asking what the class can tell about the person who owned it. Obviously, with one clue alone, very little can be said. Archaeologists often feel equally helpless when asked to evaluate a single artifact that someone has found. Much more can be determined from a group of artifacts that are known to have been found together.

Ask the class to propose a hypothesis for this exercise. If they have difficulty, suggest "the items in the bags can tell us who the owners are," or something similar. Group students in teams of two, and pass out the bags and laboratory records. One student removes the artifacts and describes them while the other records. Have the students list conclusions about the owner of the artifacts. When all have finished, have the teams present their findings to the class and ask the class to guess the owners.

Lead a discussion about the exercise. Why were some bags easier to interpret than others? Have we proved or disproved our hypothesis? When drawing a conclusion about the people who used certain objects, does the number of artifacts make a difference? How does this activity relate to archaeology?

## **MATERIALS**

- 1 brown grocery bag per student
- 5 to 10 items which each student selects
- 1 laboratory record form per student
- 1 pencil per student

**Note:** In small classes where students know each other by their distinctive attributes, you may wish to exchange bags with another class that is also studying archaeology.

# SITE IN A BAG

## LABORATORY RECORD

ITEM NUMBER	DESCRIPTION	CONCLUSIONS
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



# DISCOVERY AT DANKWORTH VILLAGE

## WHO WAS THERE? WHAT DID THEY DO?

### RATIONALE

This activity provides an opportunity for students to participate in an ethical, non-destructive exercise using archaeological techniques. The students will (1) sharpen their observation skills, (2) record data and order their thoughts, (3) interpret artifacts and features of an archaeological site, (4) communicate their findings to others - all tasks that archaeologists perform.

### OBJECTIVE

Students will use knowledge gained in the classroom about past lifestyles in southeast Arizona and basic archaeological tasks to answer questions about what period the selected site represents and what activities took place there.

### PROCEDURE

This activity requires a field trip to Dankworth Village and is designed for one class of not more than 30 students. Assistance is required by the BLM archaeologist to set up the grids on a Dankworth Village site and help with the field work. You will divide the students into teams (four are suggested). Each team will examine one grid square and record information on all observed artifacts, features, and natural objects, and draw the relationship of the items within the grid. The field information is brought back to the classroom for analysis and discussion.

1. In the classroom, the day before the field trip, divide the students into teams and introduce the activity. Review the definitions of artifact, feature, and natural object. Explain that the students will be doing the things that archaeologists do. Discuss the need for a hypothesis. Have the students decide what their hypothesis will be (refer to the Site in a Bag exercise for a simple hypothesis). Tell the students that taking notes and making drawings is very important and that each one is expected to take notes. The location of artifacts, features, and natural objects within the grid are to be measured using metric units, so each team will need a metric ruler or tape measure.

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2. Proceed to Dankworth Village. There will be four grid squares laid out. Assign one team to each. Supervise the students recording the data. Each artifact, feature, and/or natural object, possibly used by people is to be measured and drawn, and its location within the grid square recorded.
  3. Back in the classroom, have the students re-assemble into their respective teams. Each team will prepare a large size drawing of the grid square they worked on from their notes and measurements. This drawing must be large enough for the class to see from the front of the room. The team then combines their notes, analyzes their findings, and reports to the class their conclusions about their grid square. The report should describe what they recorded, the activity they think the artifacts represent, what culture produced them, and any other thoughts they had.
  4. After all four teams have made their presentation, ask the class as a whole:
    - Did all four teams reach the same conclusion about what culture period is represented and what took place here? Why? Why not?
    - If all four grid squares are looked at together is it easier to tell what culture made the site and what took place? Why?
    - If we had grid squares covering the entire site would it be easier to decide who made the site and what took place?
    - Can they answer their hypothesis?

Discuss with the students what they learned from only having part of the information about the site. It is hoped that students will understand the complexity of archaeological interpretation. Study is dependent upon artifacts, their relationship to one another and the features, and the premise that everything present is just as the people left it.

Ask the class what would happen to our interpretation if artifacts are removed by collectors?

## **MATERIALS**

notebook  
pens, pencils  
metric ruler or tape measure  
large sheets of paper for grid square drawings in classroom  
Guide to Artifacts and Features

# TIME LINE

## WHERE DO WE FIT IN?

### RATIONALE

Preparing an illustrated time line is an important activity to ensure student comprehension of man's place in the history of the Earth and where contemporary society fits into the progression of cultures in southeastern Arizona.

### OBJECTIVE

To create an illustrated chart depicting various time periods from earliest geologic time to the present.

### PROCEDURE

The geologic time chart will probably be new to the students so you may wish to describe the periods to the class starting with the Cambrian, and relating the commonly associated animals/plants to each period (e.g. Cambrian - the age of trilobites, Devonian - the age of fishes, Cretaceous - the age of dinosaurs, etc. These descriptive associations also provide the subject matter for drawings to accompany the time line.)

Point out that man as a species is not present until the Pliocene, 3.5 million years ago.

Two charts will be needed because of the length of geologic time and comparatively short period that man has been in Arizona. Start with the geologic chart.

1. A scale is needed for the time line. Because archaeologists use metric units, have the class use these for this activity. Guide the class in calculating how long a piece of paper is needed if each year equals 1 millimeter. This should give a good idea of how long ago we are talking about.

1 millimeter equals 1 year

10 millimeters equal 10 years

1000 millimeters (1 meter) equals 1000 years

1000 meters or 1 kilometer equals 1 million years

So...600 kilometers equals 600 million years. Convert kilometers to miles by multiplying by 6.214 and move the decimal point one place to the left for the answer. You should get 373 miles of paper!

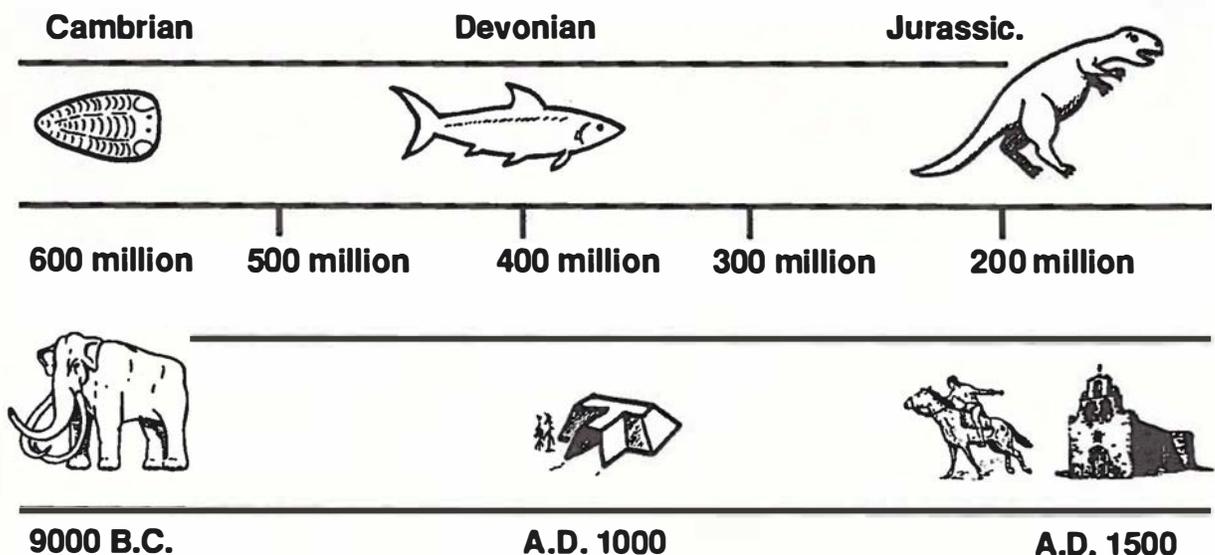
Obviously this will not work. Suggest that each 100 million years be equal to 1 meter. Place the chart on the wall around the classroom for continuing reference. Have the students prepare illustrations for the chart and label the years along the paper.

2. The southeastern Arizona time line chart only needs to cover 12,000 years. Let the class decide what metric units to use and calculate a total length of paper for the geologic time line. Once again, if one millimeter is used for one year the total paper length is a bit long for convenience (12 meters). Suggest that 25 millimeters be equal to 100 years so that 12,000 years will yield a time line chart three meters long.

If the math calculations are difficult for the class being taught, simply use arbitrary units, but still divide the total length in increments (500 years) so that the proper relationships are maintained.

## MATERIALS

- a long roll of paper, or multiple sheets (colored?) placed end to end.
- metric rulers
- pencils, pens, markers, crayons
- reference books - historical geology and southwest archaeology  
for ideas for illustrations



## HOW OLD IS THIS?

### **DATING USING TREE RINGS (DENDROCHRONOLOGY)**

#### **RATIONALE**

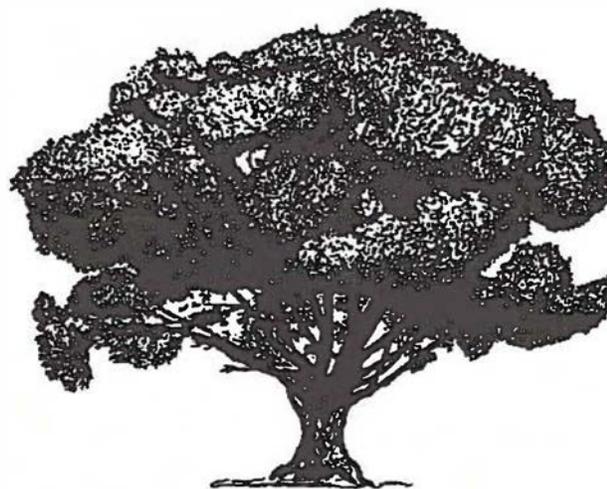
This activity introduces the student to one of the methods that archaeologists use to date cultural sites. Tree-ring dating is a method that yields an absolute date for the wood sample being examined.

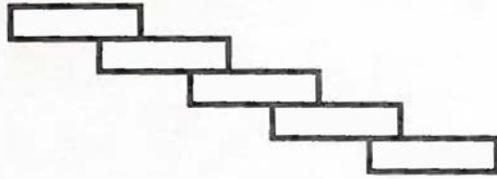
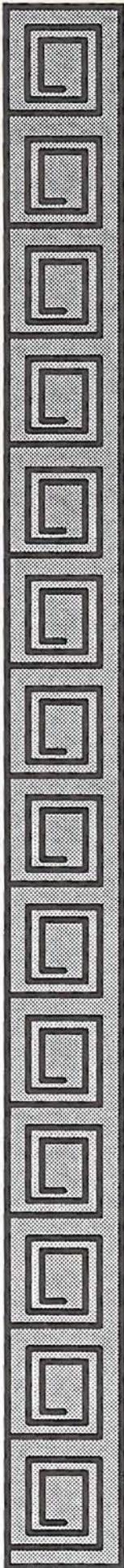
#### **OBJECTIVE**

Students will learn that, by examining samples of wood so that their rings correspond, a specific date for wood from archaeological sites can be obtained.

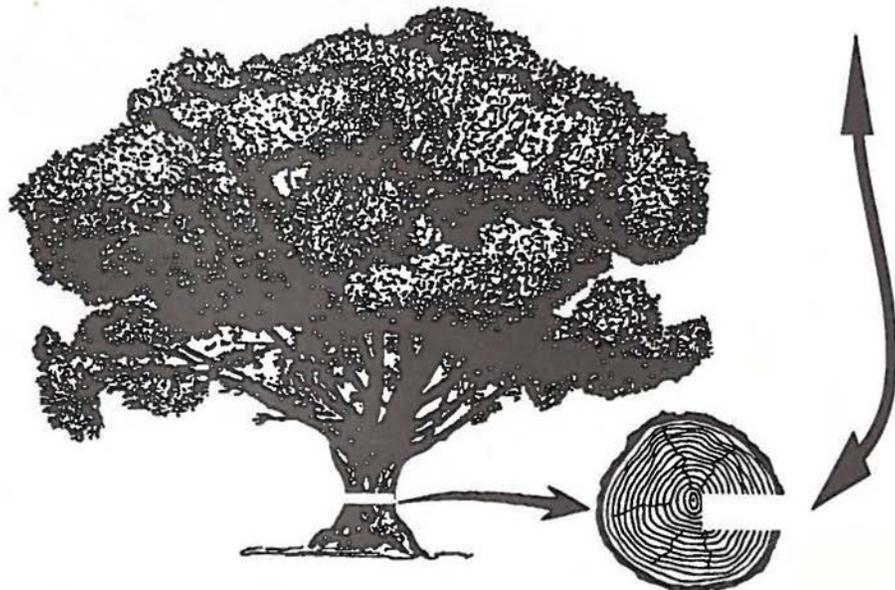
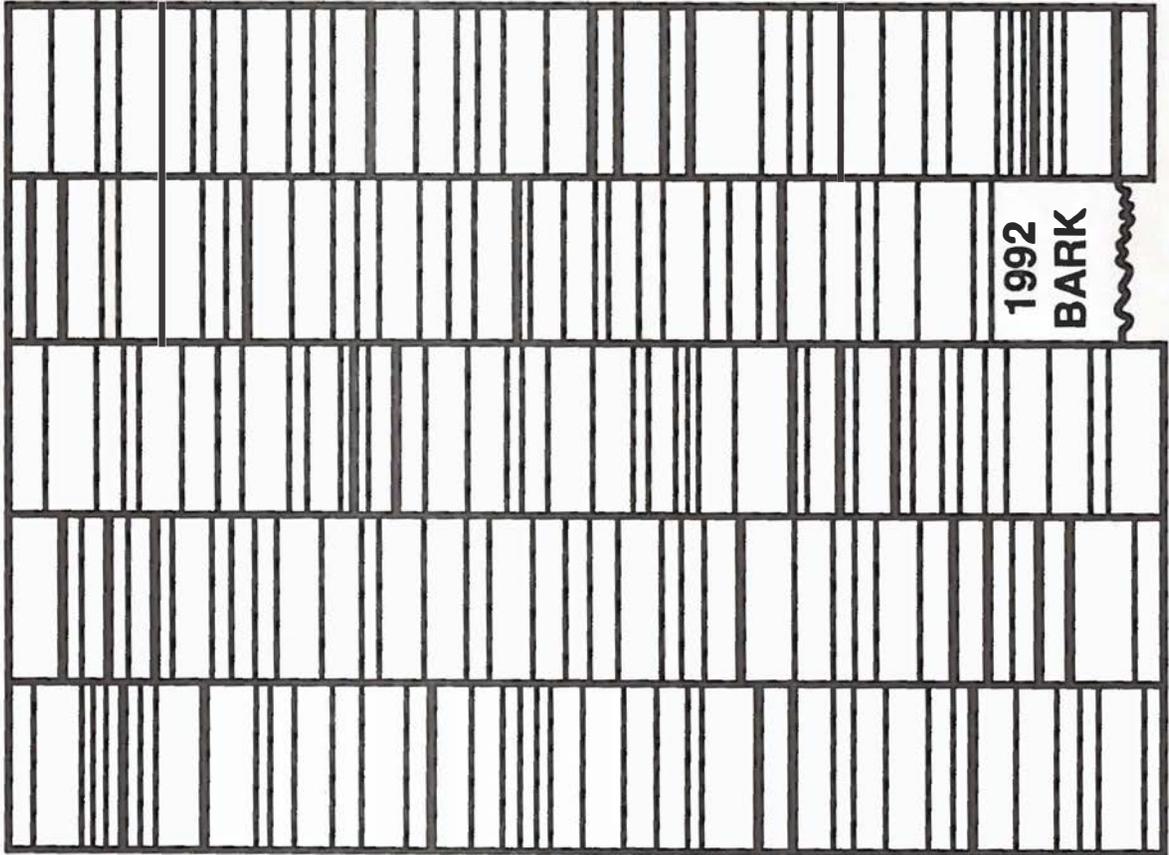
#### **PROCEDURE**

Have the students cut out the five strips of paper on the next page. Each one represents a different tree. Students will arrange the strips by matching the growth rings until a complete record is made. Tape or glue may be used to hold each strip in place once the student is sure of its placement.





**Start with the 1992  
bark edge and work  
backwards.**



# TESTING AND EVALUATION



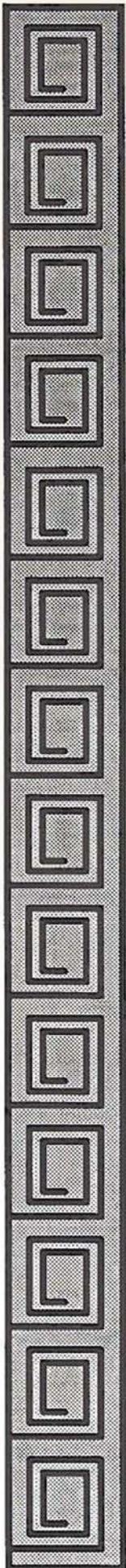
# Archaeology Crossword Puzzle

## ACROSS

1. the branch of anthropology that is concerned with the scientific study of remains of past human life
3. an artifact made of stone
4. dating with the use of tree rings
10. Paleo-Indian Culture that hunted mammoth
11. also known as radiocarbon
12. a sequence of strata, in place, are said to be \_\_\_\_\_
15. a detailed map
16. archaic culture that lived in southeastern Arizona from 8000 B.C. to 300 B.C.
19. another name for pottery
20. pueblo culture that adopted Hohokam and Mogollon traits
21. volcanic glass
24. a science dealing with the Earth's history as recorded in rocks
28. \_\_\_\_\_, beans, and squash were the primary crops grown by Arizona Indians
30. dating method that determines the approximate date that an artifact was used
31. black fine-grained volcanic rock
32. people believed to have entered Arizona from Mexico
36. the study of man
40. pieces of stone
42. the period of time with written records
44. hunting and gathering is considered an \_\_\_\_\_ life style
46. sand, shell, or rock added to clay to make pottery is called \_\_\_\_\_
47. used with a mano to grind food
50. a technique used to measure the light given off from pottery when it is heated
51. used for throwing darts with great force
52. another name for a fire pit
53. controlled digging of an archaeological site

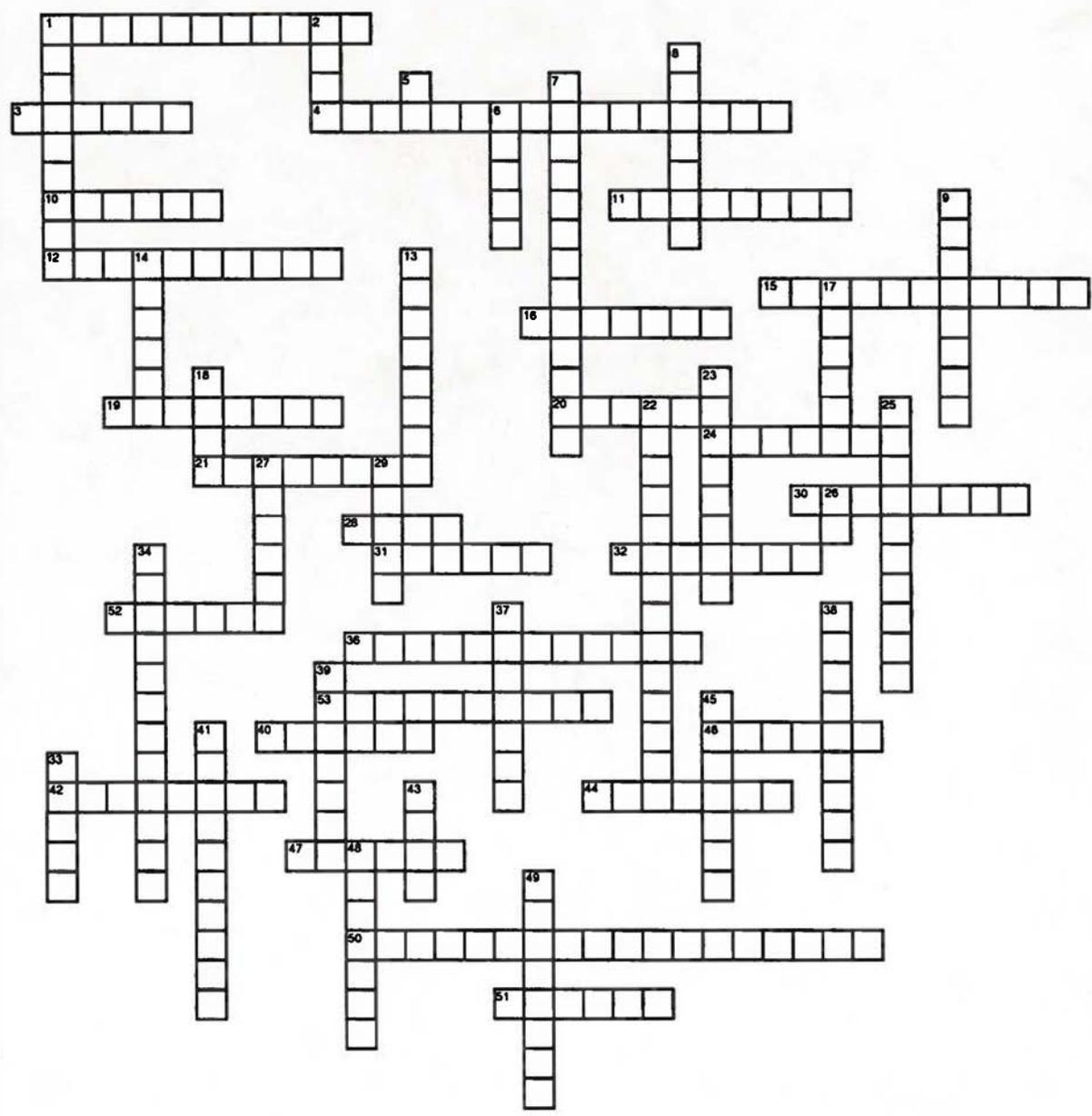
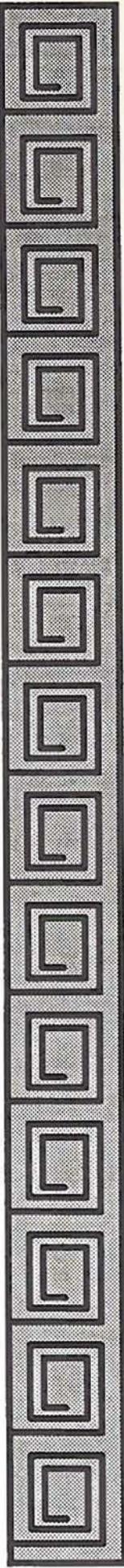
## DOWN

1. objects made, used, or modified by man
2. a network that divides a site into equal squares
5. anno Domini
6. very fine-grained quartz
7. one who does archaeology
8. all the rules, beliefs, and thinking that a group of people have
9. dating process that does not give an age in calendar years
13. an items purpose
14. culture that lives in Arizona but came for Canada

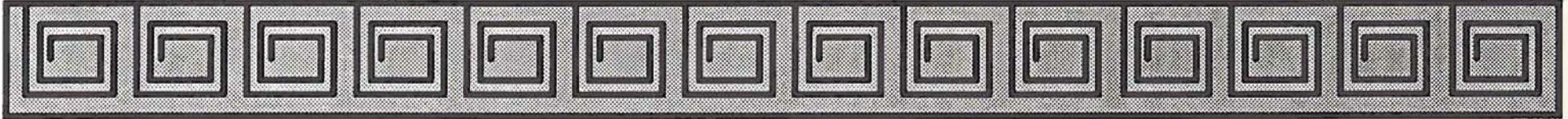


17. a village
18. Spanish word for hand
22. dating method that determines the time clay was heated to high temp
23. when the Cochise people built houses and grew crops they become  
the \_\_\_\_\_
25. a question that can be further investigated
26. time before Christ
27. corn, beans, and \_\_\_\_\_, were the main crops of Arizona  
Indians
29. soil mixed with water and used for building material
33. a piece of broken pottery
34. keeping from injury or destruction
37. the interrelated conditions in which a site, artifact, or feature occurs
38. sifting soil to catch small remains
39. larger than an artifact, smaller than a site
41. arrangement based on order of occurrence
43. any place that has remains of past human activity
45. one distinct layer of earth
48. a hole dug to determine the character of buried remains or soil
49. the same word as 9 down

# Archaeology Crossword Puzzle







**Directions:** For each culture listed on the left, answer the five questions below.  
Write the answer in the column that has the same number as the question.

	1	2	3	4	5
<b>APACHE</b>					
<b>SALADO</b>					
<b>HOHOKAM</b>					
<b>MOGOLLON</b>					
<b>COCHISE</b>					
<b>PALEO-INDIAN</b>					

1. During what approximate dates did the people live?
2. Did they live most of the year in the same place? Write nomadic, in pithouses, in pueblos, or nomadic and wickiups.
3. What sort of hunting weapons did they use? Write spear, atlatl and darts, bow and arrow and atlatl, bow and arrow, or bow and arrow and gun.
4. Did the people grow crops or collect wild plants? Write wild plants only, corn, beans, squash, and wild plants, corn, beans, squash, and cotton, acorns, mesquite beans, cactus fruits, agave, corn.
5. What other items did the people make? Write none, stone tools, pottery, baskets, and shell jewelry, pottery, baskets, copper bells, ball courts, polychrome pottery, buckskin clothing.

# STUDENT EVALUATION OF DANKWORTH VILLAGE LESSON

Grade \_\_\_\_\_ School \_\_\_\_\_

1. Choose which was your favorite lesson. Put a number 1 next to your favorite lesson. Put a number 5 next the worst lesson.

- \_\_\_\_\_ Site in a Bag exercise
- \_\_\_\_\_ Discussing how archaeologists investigate sites
- \_\_\_\_\_ Collecting data at Dankworth Village
- \_\_\_\_\_ Artifact analysis
- \_\_\_\_\_ Report to class on conclusions

2. Tell why you liked number 1. \_\_\_\_\_

\_\_\_\_\_

3. Tell why you didn't like number 5. \_\_\_\_\_

\_\_\_\_\_

4. Tell two things you remembered about sites.

\_\_\_\_\_

\_\_\_\_\_

5. Tell two things you remember about archaeology.

\_\_\_\_\_

\_\_\_\_\_

6. Is it okay to take artifacts from State or Federal lands? Why?

\_\_\_\_\_

\_\_\_\_\_

7. Tell two reasons that people like artifacts and the things of the past.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_