



Theme 1

ANCIENT TEACHINGS IN ARCHAEOLOGY

An Introduction to Archaeology

Lesson 1A 3

WHAT IS ARCHAEOLOGY?

Archaeology is the study of the past through artifacts, ecofacts, and features.

Arch Activity: The Mystery of the Missing Pages 7

Lesson 1B 9

HOW IS ARCHAEOLOGY CONNECTED TO THE PRESENT?

The past is connected to the present—and to the future—through knowledge of the lifeways and challenges faced by past people.

Arch Activity: Past Times 12

Lesson 1C 13

**HOW DO ARCHAEOLOGISTS FIND AND STUDY
ARCHAEOLOGICAL SITES?**

Archaeologists survey, excavate, and research sites.

Arch Activity: Site in a Box 20

Lesson 1D 23

**WHY DO WE PRESERVE AND PROTECT ARCHAEOLOGICAL
SITES?**

Preserving and protecting archaeological sites provides information for future generations.

Arch Activity: The Importance of the Past 26

Lesson 1E 27

WHO IS AN ARCHAEOLOGIST?

Dr. Thomas A. Foor is an archaeologist.

LESSON 1A—NARRATIVE: WHAT IS ARCHAEOLOGY?

If you have ever moved from one home to another, you know that you and your family left behind broken toys, outgrown clothing, and other belongings that you no longer found useful. Imagine that the next people who moved into your old house found the things you left behind. Those people could then learn something about you, and your daily life, by studying the objects you discarded. They could learn about your **technology**, or the tools you used. They could learn how you managed to stay alive, or **subsist**, by studying the foods you ate. And they could study your **shelter**, or home, and the protection it gave you.

Scientists today study technology, subsistence, and shelter of people from the past. This study of the tools, foods, and homes from former times is called **archaeology**. Archaeology is the process of discovering, interpreting, and preserving the past. The scientist who conducts these studies is called an **archaeologist**. Archaeologists create stories of the past through careful research. First, they find items at a specific place. Next they carefully describe those items and may take them to a laboratory. In the laboratory, the archaeologists study and analyze the items they have discovered. From this study and analysis, archaeologists can then determine a story of the past. The story will tell of the lives, movements, and survival of people, either **recent** or **ancient**, and describe their way of life. Ancient means very long

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ago, from the far distant past. Recent refers to modern times.

Archaeologists search for **artifacts**. Artifacts are the objects that people have made or used. An artifact may be a stone tool of long ago, or broken glass from the more recent past.

In addition to artifacts, archaeologists search for and study **ecofacts** and **features**. Ecofacts are items from nature that provide clues to the past. Seeds or animal bones found in a fire pit are ecofacts. Features are non-movable things that indicate that humans have been present in a certain place. An example of a feature is soil that is discolored or stained by bacteria and mold, where a wooden post rotted in the ground. A feature may also be a place where people spent time, like a tipi ring or a fire pit. Artifacts, ecofacts, and features present definite clues that help an archaeologist re-create the past.

People left artifacts, ecofacts, and features behind at the **sites**, or locations, where they lived. Ancient

The excavations at Pictograph Cave, south of Billings, in the late 1930s and early 1940s, were the beginning of scientific archaeology in Montana. *Spencer Lauson, photographer. Courtesy Montana Historical Society Photograph Archives.*

Montanans did not have homes like ours. Their homes may have been caves, rock overhangs, or structures made of timbers and animal skins. Their homes could be either temporary or permanent, depending on whether food was available. Ancient people did not shop at grocery stores. Instead they were **nomadic** and roamed the land, gathering plants and hunting animals. Many of these ancient hunters and gatherers moved with the changing seasons. The items they left behind were eventually buried by soil and dust. The discoveries made at ancient sites provide clues as archaeologists attempt to understand the past.

A Montana archaeologist might study and research an ancient camp-fire pit for clues to the past. The site may contain ecofacts like animal bones and pieces of stone tools. These are ordinary items from the lives of ordinary people. Thrown away or dropped when they were no longer useful, and sometimes lost, they are the garbage of the past. Ancient garbage is called a **midden**. Middens provide many objects for archaeologists to study.

An archaeologist thoroughly researches the information presented by artifacts, ecofacts, and features. Then the scientist creates an idea, or **theory**, that explains the daily life of early Montanans. Interpreting an object's use and function may be difficult. Because of this, not all archaeologists reach the same conclusions about what an artifact was used for or what

an ecofact or feature means. As a result, different archaeologists come up with different theories about the nature of past life. Future discoveries and advancements in research methods may challenge our current theories.

Montanans of long ago were the ancient **ancestors** of today's American Indians. The most ancient of Indian groups on North America are named **Paleoindian** people. Paleoindians lived more than 8,000 years ago. They lived in Montana during the end of the last Ice Age. Paleoindian artifacts indicate that these people hunted some animals that no longer exist. After the Paleoindians, the next group of ancient people are called **Archaic** people. They lived in Montana between 8,000 to 2,000 years ago. Archaic artifacts indicate that these people made use of more plants and animals than Paleoindians did. The most recent ancestors of today's Indians are the **Late Prehistoric** and **Protohistoric** peoples. These groups lived much like Archaic people, except that they depended more on the bison to survive. The most recent ancestors of today's Indians introduced the bow and arrow as a weapon, and they later used horses for transportation and travel.

Archaeology is often very puzzling and mysterious. And the intrigue of the past attracts people to the study of archaeology. Finding missing pieces of the past's puzzle—and solving the mysteries of ancient life—makes being an archaeologist rewarding.

LESSON 1A—VOCABULARY: WHAT IS ARCHAEOLOGY?

ancestor _____

ancient _____

archaeologist _____

archaeology _____

Archaic _____

artifact _____

ecofact _____

feature _____

Late Prehistoric _____

midden _____

nomadic _____

Paleoindian _____

Protohistoric _____

recent _____

shelter _____

site _____

LESSON 1A—VOCABULARY: WHAT IS ARCHAEOLOGY? (CONTINUED)

subsist _____

technology _____

theory _____

LESSON 1A—ARCH ACTIVITY: THE MYSTERY OF THE MISSING PAGES

Grades: 3–8

Time: 30–45 minutes

Content Area: science, writing, and reading

Who: whole class and small group

Materials:

mystery book—30 to 40 pages

worksheet—12 copies

pencils and coloring tools

Arch Journal

OBJECTIVE AND OUTCOME

- Students will gain an understanding of how an archaeologist uses clues to determine the past.
- Students will reconstruct a book by creating the missing pages. Then they will compare their work to that of an archaeologist.

ACTIVITY

1. Select a disposable story book (30–40 pages). Tear apart into individual pages. Divide book into 6 equal groups and remove 1 or 2 pages of text from each group.

2. Divide class into 6 equal groups. Instruct each group to choose a writer, an illustrator, a reader, and a materials manager. The materials manager hands out book pages in sequence, and 1 or 2 worksheets to each group. Each person needs at least 1 page.

3. Inform students the book is incomplete. Instruct groups to order the pages chronologically. Each student then reads his or her page(s) aloud in the group. The group's task is to study the available information and create the missing story on the worksheet (writer and illustrator). Allow 10–15 minutes.

4. Return to whole class. Each reader shares his or her group's part of the story in order, including their re-creation of the missing pages.

5. Discuss: How did each group determine the missing pages? What

factors entered into the re-creation? What changes would a group make upon hearing the remainder of the book from other groups? How is their assignment similar to an archaeologist's work? Why are they both mysteries?

6. Show students the missing pages and read the missing text.

7. Share ideas with the class and discuss.

EXTENSIONS

3–5:

- Research vocabulary.

See: Lesson 1A—Vocabulary

6–8:

- Challenge students to read about archaeological sites and to locate them on a map. See: Montana Archaeology Education Resource Catalog: Student Reading List

LESSON 1B—NARRATIVE: HOW IS ARCHAEOLOGY CONNECTED TO THE PRESENT?

Try to remember some of the items that you left behind when your family last moved. Or if you haven't moved recently, imagine what you might leave behind if you did move. Some objects will tell a lot about you. Others may be a puzzle for future generations to solve. If you wanted to leave specific clues about your life, you might write a journal or diary describing daily events. You might leave photographs of family gatherings.

When future generations discover these items, they will learn many details of your life. These are the kinds of clues that help archaeologists understand your **culture**. Culture is the way a group of people lived together in a particular place for an extended period of time. Archaeologists study past cultures through their artifacts, features, and sites—and sometimes through written records.

Our culture's ability to communicate by writing will tell future archaeologists much about us. Writing was established a relatively short time ago, around 3000 B.C. in the Old World. The use of writing marks the time known as **history**. Reading about historic events provides much information to study the more recent past. Historical archaeologists use written evidence to help explain the artifacts and mysteries of historic cultures.

The period of time before writing's existence is known as **prehistory**. Prehistory extends over a vast span of

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time, covering hundreds of thousands of years. Prehistoric archaeologists have no written material to assist them in studying the past. Only artifacts, ecofacts, features, and sites provide clues to prehistoric cultures. Writing did not exist in Montana much before A.D. 1800. All time before that date is our state's prehistory. However, written communication was present in many locations in our country much earlier. The boundary between historic and prehistoric time varies from place to place throughout the world.

Archaeologists study both historic and prehistoric people. In studying historical times, they focus on artifacts, but they also use written records. In contrast, when studying prehistoric people, they must rely on artifacts without the help of the written word. Sometimes the stories that members of a culture passed down over generations can help us to understand the distant past. These stories are called **oral history**. But mostly, archaeologists must study artifacts to learn about prehistory. They study the technology of prehistoric people. They determine hunting methods by analyzing ancient tools found at sites. Other artifacts reveal the processes used to gather and prepare food. These objects also help archaeologists learn about the plants and animals of long ago. And by studying the remains of prehistoric humans, archaeologists discover information about diet and past living condi-



Tools have changed over time. Technology, or the tools used, is one characteristic archaeologists use to describe a culture. Courtesy Kootenai National Forest.

tions. They investigate Paleoindian and Archaic shelters to learn how those prehistoric peoples protected themselves from the natural elements.

The study of prehistoric archaeology is only about 150 years old. The search for understanding the ancient past is just beginning. Archaeologists most frequently find prehistoric artifacts made of stone. Stone is a material that is **inorganic** and **non-perishable**. This means that stone is a non-living material that can survive for thousands of years. Other items made of plant or animal matter, like wood, leather, fiber, bone, and hair, are **organic** and **perishable**. If left exposed to the elements, they decay within a few hundred years. And because organic artifacts often do not survive, a prehistoric archaeologist's work can be very challenging.

Artifacts are found throughout our state. The ancient peoples of Montana were nomadic, moving across the land in search of food. They did not remain in one location for any great length of time. For this reason, any site that is undisturbed and contains many prehistoric artifacts is extremely rare and valuable for archaeologists.

The environment in which Montana's early people lived presented them with many difficulties. They could be injured or killed while hunting large animals. Their sources of food varied with the seasons and climate. And when the climate changed, they had to alter their patterns of **mobility**, or movement. Their survival depended on their ability to adapt to the rugged land and its challenges. People today face similar problems regarding technology, subsistence, and shelter. Understanding the

difficulties of ancient people provides knowledge for both present and future cultures. When we know about weather conditions and the availability of food in the past, we are better prepared to cope with food production in the future. Patterns in the development and decline of past civilizations supply knowledge for current **societies**, or communities, helping them to co-exist.

Archaeologists want to know who the ancient people were, where they came from, and how they lived. Ancient people across the world resembled each other, sharing many traits. Even if they were not our direct ancestors, they may be like them. The information archaeologists gather tells us where we have been and who we are. Archaeology enables us to experience the richness and diversity of past cultures. Learning about ancient people gives us an understanding of the present. And it gives us the ability to predict the future. After all, our present, and our future, will soon become the past.

LESSON 1B—VOCABULARY: HOW IS ARCHAEOLOGY CONNECTED TO THE PRESENT?

culture _____

history _____

inorganic _____

mobility _____

non-perishable _____

oral history _____

organic _____

perishable _____

prehistory _____

society _____

LESSON 1B—ARCH ACTIVITY: PAST TIMES

Grades: 3–8

Time: 40 minutes (homework)

Content Area: history, math, and writing

Who: whole class and individual

Materials:

timeline materials:

ruler & construction paper

writing tools

Arch Journal

OBJECTIVE AND OUTCOME

- Students will apply their past knowledge to that of the ancient past.
- Students will create a personal timeline, with specific guidelines.

ACTIVITY

1. Instruct students in creating a personal timeline. Give all students specific time representations for measurement, example: 2 inches = 1 year. Also, give instructions for a horizontal format and size.

2. Students should place the following on their timelines, by year:

- ~ 5 events from each student's life that are significant
- ~ 1 important historical event that has happened during their lifetime
- ~ 2 events from their family's history that happened before they were born
- ~ 2 events that they predict will happen to them in the future

You may need to share examples from your own life. Work on the timelines may take place in class, or may be a homework assignment.

3. Place the finished timelines on a wall or bulletin board. Make sure the dates are vertically aligned.

4. Complete the following discussion activities. Individuals should record work in their Arch Journals.

- ~ What is the range of dates

represented?

- ~ What is the difference in the range?
- ~ Which year has the most representation?
- ~ What are similarities in the timelines? Differences?

EXTENSIONS

3–5:

- Research vocabulary.

See: Lesson 1B—Vocabulary

- Study genealogy and create a family tree.

6–8:

- Create a world civilization timeline for a specific century.
- Research the history of writing and the invention of the printing press.

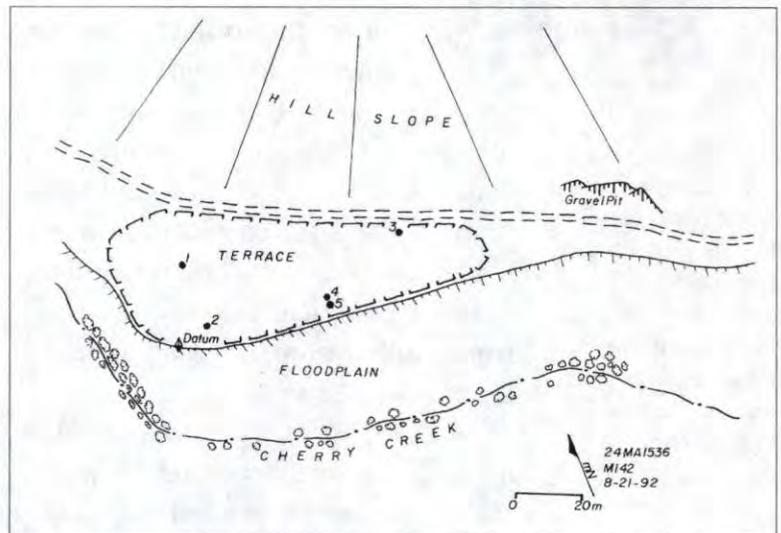
LESSON 1C—NARRATIVE: HOW DO ARCHAEOLOGISTS FIND AND STUDY ARCHAEOLOGICAL SITES?

Archaeologists work like detectives to find clues that help solve the mysteries of how past peoples lived. They use a variety of special methods to find and study **sites**, or the places of past human activity. Precise and accurate research methods are necessary to expose and **excavate** archaeological sites. In archaeology, **excavation** means to dig systematically and carefully to expose, record, and recover buried artifacts, ecofacts, and features. Archaeologists also use special scientific methods to understand and **analyze** the things found at a site. To analyze means to study something critically and objectively in order to identify its parts and understand how they relate to each other.

Some sites involve teams of archaeologists working together. One team may find the site, another may excavate it, and yet another team will analyze the artifacts. Often an additional team then writes the report that presents the information the other teams have found. The archaeological process is slow and time-consuming work. It may take years to complete a site excavation. The final interpretation of what took place at a site may take additional years. Because it takes so much time, archaeological work can be very expensive.

Archaeologists conduct **surveys** across the landscape to find sites. Before starting, archaeologists develop a **survey strategy**, or **research design**, for the area they plan to study. They

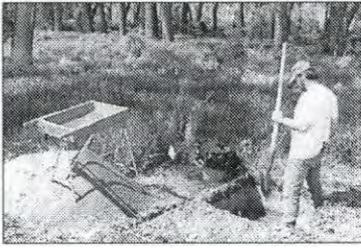
Archaeologists survey, excavate, and research sites.



look at the archaeological information already known about the area and determine the most likely location for a site. Then they begin the survey by walking specific areas in roughly parallel straight lines or paths, called **transects**. They figure the distance between transects by determining the **probability**, or chance, of finding prehistoric sites. The probability is high along a river or near a spring, and so they space transects in those areas between 10 to 30 meters apart. On a steep mountain slope, the probability of finding a site is much lower, and so there they space transect lines 100 to 300 meters apart. Archaeologists use a compass for guidance along a transect line.

As archaeologists walk the transects, they look for artifacts on the ground or other evidence that prehistoric people may have used the area. A common find is a stone tool. It may have been left behind while it was being made, or because it was broken and no longer useful. Archaeologists

A site map is an important part of an archaeological site form. The numbered points here (1-5) represent places where archaeologists collected artifacts from the surface during a survey. *Courtesy Montana Historical Society, Flying D Ranch Archaeological Project.*



Archaeological excavation units are square or rectangular because they are part of a grid. Archaeologists use screens during an excavation to sift the dug soil to recover small artifacts. *Tim Urbaniak, photographer.*

also carry a tape measure, a field notebook, and **site forms** to record information. On the site forms, they write down the artifacts they see and the location, elevation, and size of the site. They

also record how close the site is to water, and the vegetation and landscape at the site. They also sketch a map of the site, and plot it on a United States Geological Survey (U.S.G.S.) **topographic map**, showing the exact location of the site.

Archaeologists sometimes complete a survey strictly for research purposes, so that they can understand the reasons past people spent time in a certain location. Sometimes, private organizations and foundations, such as the National Science Foundation, sponsor research surveys. Other surveys are done when someone plans to develop an area. Federal land laws require surveys before development can happen, because construction activities may harm prehistoric sites. Development can include road building, dam construction, timber harvesting, and many other types of construction.

Projects not on federal land that are funded by the federal government or projects that require federal permits also must be surveyed before construction can begin. Many states have laws governing state-owned lands that require archaeological surveys. If a farmer or homebuilder uncovers an archaeological site, or if animals uproot artifacts on private land, archaeologists may also be asked to complete a survey.

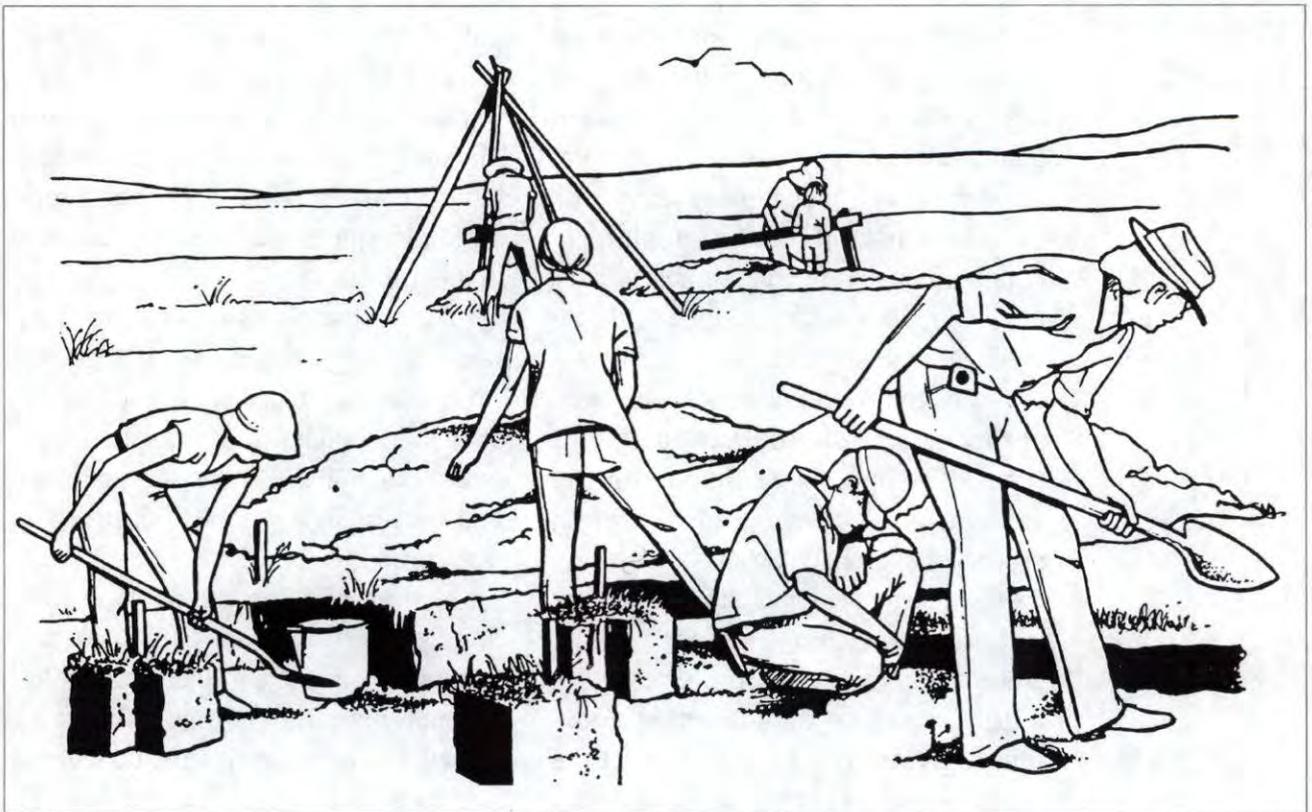
Those developing a piece of land can avoid disturbing most archaeolog-

ical sites discovered during a survey. However, if a site is found during a survey and it could be harmed by construction, the next step is to determine how important it is. A site with artifacts under the ground may be significant due to the surrounding **context** and because its features are undisturbed. Buried sites are discovered by **shovel testing**. Archaeologists dig, or excavate, a series of small holes with a shovel. Or they may use an **auger**, a drill used to bore holes in the ground. How deep archaeologists dig when shovel testing depends on a site and its artifacts. On the site form, archaeologists map all the holes they have excavated. They then place any artifacts in bags, with a separate bag for each hole and sometimes even for each depth within a hole.

Many sites contain artifacts on the surface of the ground only. Archaeologists map, and then may collect, these artifacts. Any collected artifacts are studied and placed in museums for future research. A museum may also display the artifacts.

Archaeological sites buried beneath the ground often provide a great deal of information. Artifacts may show that different groups of people, over thousands of years, used the site. The **stratigraphic layers**, or stacked levels of earth and artifacts, furnish a picture of the technology, or tools, used by a group of people, the foods they ate, how they prepared their foods, and which kinds of shelter they lived in. Archaeologists study the patterns presented in each **stratum**, or layer, to find similarities and differences in ancient people over periods of time.

For example, imagine a group of



prehistoric people that camped next to the Yellowstone River 5,000 years ago. These people cooked bison meat and left behind a rock-lined fire pit, complete with charred bison bones. One thousand years pass. Wind, rain and snow, and floods deposit soil over the ancient campsite. This layer of earth on top of the former camp is **sterile**—contains no artifacts—because no one lives there during those years. Then another prehistoric group camps at the same site. These ancient people collect plants, and they scrape and process animal hides for clothing. They leave behind a broken mano—a tool for grinding dried plants—three broken hide scrapers, and an ancient bone needle. Over the next 4,000 years, more soil builds up on the campsite. When modern-day archaeologists discover and excavate the site, they find two stratigraphic

layers of prehistoric **occupation**—evidence that two different groups of people lived here at two different times. When the archaeologists study the **strata**, or layers, they learn of the events that took place at the site at each time. If the artifacts from both layers were disturbed by a backhoe digging a trench for irrigation, the site would be confusing for archaeologists. They would find it difficult to identify the two different sets of activities at the site, and their dates. Sites that have not been disturbed provide greater information about the past than those that have been disturbed.

When a site excavation is planned, a **site director** is selected before work begins. The site director supervises all the work and first prepares an excavation **research design**. The design outlines the type of information the members of the excavation team hope

An archaeological excavation involves many people working together.
Courtesy Kansas State Historical Society.

to gather and the questions they hope to answer when studying the site. The design also establishes the excavation techniques and analysis of information the site director plans to use during the excavation. Once the design is complete, several professional archaeologists may review it to ensure that it meets archaeological standards.

After the research design has been approved, the site director selects a team of people to participate in the excavation. They may be students, professional archaeologists, or amateurs trained in archaeology. The first step for the excavation team is to clear all vegetation from the site. Then they establish a **grid**—based on the **Cartesian coordinate system**—on the surface of the ground. This grid is the team's primary recording method, helping them remember where they found each artifact and feature. Using Metric system measurements, the team sets the grid with a **transit**—an instrument used to survey horizontal and vertical angles—along with measuring tapes and wooden stakes. The stakes are placed in the corners of each square of the grid. The size of each square is often one or two meters on a side. Larger squares would provide less specific location information. Each square receives a coordinate number for identification. Once the grid is set, a site map is drawn on graph paper, with squares that match those in the grid on the ground.

Then the work of actual excavating begins. Archaeologists use shovels, trowels, small brooms and brushes, screens, and dustpans to uncover a site. They remove dirt slowly from the ground, square by square, and are careful not to destroy any archaeolog-

ical information. They record the location and depth of each artifact, ecofact, and feature on a **data sheet**, and they label each item with the corresponding square number. They shake the excavated dirt through a screen to capture small artifacts.

The archaeologists make detailed maps, drawings, notes, and photographs throughout the stages of the excavation. Once they complete the excavation, they usually back-fill the site with the dirt that was excavated. A planned construction project can then proceed.

The excavation destroys a site. Once the artifacts and features are removed from the ground, archaeologists can not return to repeat the excavation. Therefore, they must take great care to accurately record and map all information. Future research can be conducted if the data gathered during the original excavation is precise. If the data is precise, specialists do not even need to see a site to study it! The key to site interpretation is the proper recording of artifacts and features and their relationships with each other.

A site excavation is probably the least time-consuming task when archaeologists try to reconstruct the past. They must spend months, and even years, of study to analyze and interpret samples taken from a site. They send artifacts and plant and animal samples to various specialists for analysis.

Archaeologists use computers extensively. Using **statistical data analysis**, they can compare new data with that from other archaeological sites and studies. Archaeologists also turn to **ethnography**—the study of modern groups of primitive people—for clues to past people and their

technology, subsistence, and shelter. When archaeologists use information about these cultures to help reconstruct the past, they are making an **ethnographic analogy**. They may also **experimentally replicate** artifacts—that is, try to copy ancient tools—in order to better understand past cultures and how they manufactured the things they used. Archaeologists have a strong professional **ethic**, or set of values, that requires that they quickly publish the information they discover during excavations. Publication in an archaeological journal, or a book, makes current archaeological research available to everyone.

When archaeologists interpret the events they learn about during their analysis of artifacts at a site, they also date the events. They arrange the events in the order in which the events happened. They do this by **relative**

dating and **absolute dating**. Relative dating orders events in relation to each other, but does not date events to a specific time. Absolute dating places a specific time on artifacts, features, and events. There are several methods for obtaining results for both types of dating. (You will find a discussion of dating methods in Theme 3, Lesson E).

The process of archaeology is complex. It takes a great deal of time to locate, excavate, analyze, and report on a site. Archaeologists are dedicated to preserving and protecting the past through their work. The excavated artifacts may be given to a public museum, or to an Indian tribe with jurisdiction over a site, once the analysis is completed. Museums make artifacts available for future research. And in museums, artifacts may also be placed on display so that visitors can enjoy them and gain knowledge of the past

**LESSON 1C—VOCABULARY: HOW DO ARCHAEOLOGISTS FIND AND STUDY
ARCHAEOLOGICAL SITES?**

absolute dating _____

analyze _____

auger _____

Cartesian coordinate system _____

context _____

data sheets _____

ethic _____

ethnographic analogy _____

ethnography _____

excavate _____

experimentally replicated _____

grid _____

occupation _____

probability _____

relative dating _____

research design _____

**LESSON 1C—VOCABULARY: HOW DO ARCHAEOLOGISTS FIND AND STUDY
ARCHAEOLOGICAL SITES? (CONTINUED)**

shovel testing _____

site director _____

site forms _____

sites _____

sterile _____

statistical data analysis _____

stratigraphic layers _____

stratum/strata _____

survey strategy _____

surveys _____

topographic map _____

transects _____

transit _____

LESSON 1C—ARCH ACTIVITY: SITE IN A BOX

Grades: 3–8

Time: 60 minutes+

Content Area: science, writing, math, and critical thinking

Who: individual and small groups

Materials:

4–8 cardboard boxes or plastic tubs (2 for each group)

Different types of dirt and rocks

“Artifacts”: ceramic pieces, coins, bones, dried foods, small tools, product labels, bottles, etc.

Tools: trowels, brushes, tape measures, small plastic bags, clipboard, paper, and pencils

Arch Journals

OBJECTIVE AND OUTCOME

- Students will discover the scientific process of archaeological excavation and develop ideas about past cultures.
- Students will demonstrate how archaeologists uncover, document, and analyze artifacts.
- Students will describe a culture on the basis of its artifacts.

PREPARATION

Before beginning, do the following:

1. Choose artifacts to represent several modern or historic “cultures.” Students may or may not be familiar with the artifacts. Fragments of an artifact such as a dinner plate or machine parts are intriguing for students to piece together or figure out how they worked.
2. Layer the artifacts with dirt and rocks in each site box created. Some artifacts should be left partially uncovered on the surface. Leave a layer of empty soil between each layer of artifacts. Use different types of soil, like sand and clay, to provide stratigraphic

layering. Use 15–20 artifacts per box.

3. Mark north, south, east, and west on each box using stickers.

4. Draw a line inside each box to indicate the surface level. This will be the point from which students will make their depth measurements.

ACTIVITY

1. Divide students into groups based on the number of boxes you have. Each group will need a site box and an empty box in which to put their excavated soil and rocks. Instruct students to do all writing activities in their Arch Journal (like a field notebook).

2. First, have students make a map of the site, showing artifacts where they appear undisturbed on the surface. Students should orient the map with north at the top and establish some kind of scale.

3. Once the surface of the site is mapped, begin excavating the site. Have students take turns doing the excavating and data recording. Using

trowels and brushes, carefully skim off and remove the dirt and rocks across a layer to reveal the artifacts in that layer. The students should not dig holes that cross into different layers.

4. As each artifact is uncovered, it must be documented before it is removed. Begin by giving each artifact a number (1, 2, 3, etc.). Then record information in the Arch Journal about the artifact *in situ*, which means as it appears in place:

~ Record the depth from the surface at which the artifact was discovered, using the surface line as a starting point of zero. Measure in centimeters.

~ Note any other artifacts that were found next to it. This establishes a possible relationship between artifacts.

~ Describe the context of the artifact. Note the soil type or what layer the artifact was found in. Soil changes resulting in distinct layers, or strata, usually indicate different periods of occupation.

5. Once the information about the location of the artifact is recorded, remove the artifact. Record information in the Arch Journal that describes the type of artifact:

~ Describe its material, shape, and general characteristics.

~ Measure its dimensions

~ Draw a picture of the artifact.

6. Place the artifact in a small bag labeled with the object number and where it was found. Continue excavating.

7. Once all the artifacts have been recovered and documented, the analysis of artifacts begins. Students must decide how each artifact was made and used. They must also deter-

mine which artifacts are related and why. (Hint: Artifacts within the same layer belong together and to the same time period.) Based on these conclusions, the students will write a description of the culture or cultures that left the artifacts behind.

EXTENSIONS

3–5:

- Research vocabulary.

See: Lesson 1C—Vocabulary

6–8:

- Challenge students to read an article about an archaeological excavation. Instruct them to focus on how archaeologists learned information from the artifacts—and what clues archaeologists used to interpret the activities and culture of these ancient people.

LESSON 1D—NARRATIVE: WHY DO WE PRESERVE AND PROTECT ARCHAEOLOGICAL SITES?

Many families record events and celebrations with photographs. The photos show what family members looked like through time. If the photos are lost or destroyed, the record of the family changes. The events remain in people's memories, but the objects describing those memories—the photographs—are gone forever. A future archaeologist would have difficulty interpreting your past if artifacts have vanished.

The same difficulty applies to an archaeological site and its record. The position and location in which artifacts are found provide clues for an archaeologist. If the objects are destroyed or missing, or if the artifacts are disturbed or mixed up, the archaeologist will find it difficult to determine the story of the site. The place where an artifact was left by prehistoric people, and that position in relationship to other artifacts in the site, is known as **context**. Context is vital during archaeological research. Context provides solid clues for site reconstruction. If the context is disturbed, important evidence about the past is forever lost. Context may be disturbed accidentally or intentionally by humans, or by natural occurrences.

All pieces of the puzzle are necessary for interpretation and reconstruction of the past. Context assists archaeologists in dating a site, and in determining the activities that took place there. Scientists can learn about the plants and animals eaten by people of long ago. And they can verify in which season of

Preserving and protecting archaeological sites provides information for future generations.

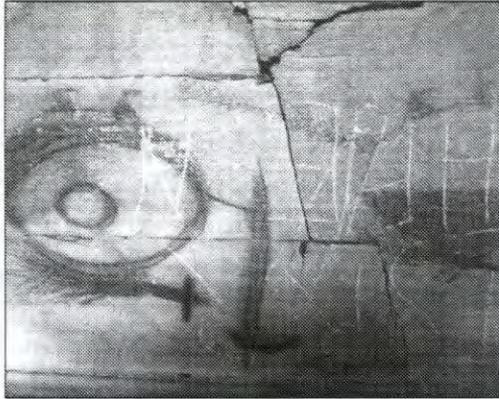
the year the ancient people consumed these foods. Archaeologists even discover how long a site was **inhabited**, or lived in, by studying context.

If a site is disturbed or destroyed before archaeologists can make proper records, valuable information is lost. A site can not be re-created once artifacts have been disrupted. Archaeological sites are fragile, **non-renewable resources**. It is extremely important to leave a site as it exists, unless you are prepared professionally to take responsibility for recording it properly.

If you have ever lost something special, you know that you felt sad about the loss. Archaeologists experience the same feeling if a site is destroyed. Knowledge and understanding of the past—the most important things archaeologists learn from a site—are lost forever. Many artifacts are very beautiful and are valued for their artistic qualities. Some people steal these items from archaeological sites and sell them. These **pothunters**, or people who only dig for pretty artifacts like whole pots, take away our chance to gain awareness of the past. They rob us of our past. Other people **vandalize** sites and destroy them for no reason. In addition to vandals and pothunters, other circumstances threaten archaeological sites. A new housing development may disturb an ancient campsite. Other threats may be construction of shopping malls or oil and gas pipelines. A farmer tilling a new field may disturb artifacts. Progress and growth in our civilization

Right: Prehistoric artifacts are sometimes bought and sold along with other Native American craft items. However, without their context, artifacts lose their meaning and significance to archaeology.

Below: Modern vandals scratched their initials over this ancient rock art in Fergus County, Montana. Acts of vandalism can destroy archaeological sites. *Courtesy Montana State Historic Preservation Office.*



threaten archaeological sites daily. We lose knowledge of the past any time a site is improperly dug or disturbed.

Laws are written to preserve and protect archaeological sites. The first law passed in the United States that protected sites was the **Antiquities Act of 1906**. The Antiquities Act makes it illegal for people to disturb archaeological sites on federal **public land**—land that belongs to the federal government—without special permission from the government. The **Montana State Antiquities Act**, passed in the 1970s, protects archaeological and historical sites on state-owned property. These laws also allow the police to arrest pothunters and fine them for **looting**, or illegally taking artifacts away from sites. These and other federal and state laws protect and preserve the archaeological past

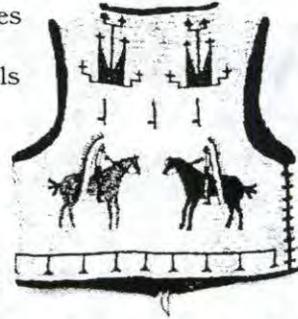
Wanted

American Indian Artifacts

Whole Collections or single pieces

We Need:

- Beaded pieces
- Rugs
- Kachina Dolls
- Baskets
- Jewelry
- Weapons
- Art work
- Pottery
- Arrowheads
- Stone relics
- Old or new



Send Photos or call Steve at

Auctions Since 1967

"We sell more Indian items than anyone in the world!"

on public lands for future generations.

Archaeological sites and artifacts are messengers from the past. If we know how to read the messages, artifacts tell us much about people of long ago. The people who lived on a site may have been there hundreds, or even thousands, of years ago. All cultures, modern or ancient, contain value for our society.

The past is our **legacy**, a gift passed down to us by those who first inhabited this land. Our connections to the past are strong. And all Montanans deserve an opportunity to know about the people who were here before us. You are a caretaker, or **steward**, of our **heritage**, which includes the traces of Montana's early peoples that lie buried in our landscape. Protect and preserve the past for present and future generations.

LESSON 1D—VOCABULARY: WHY DO WE PRESERVE AND PROTECT ARCHAEOLOGICAL SITES?

context _____

heritage _____

inhabited _____

laws _____

legacy _____

looting _____

Montana State Antiquities Act _____

nonrenewable _____

public land _____

steward _____

vandalism/pothunters _____

LESSON 1D—ARCH ACTIVITY: THE IMPORTANCE OF THE PAST

Grades: 3–8

Time: 40 minutes

Content Area: history and writing

Who: whole class and small group

Materials:

2 photos of family activities

writing tools

Arch Journals

Some people say that a photograph is worth a thousand words. . . .

Courtesy K. C. Smith, Museum of Florida History, Tallahassee.



OBJECTIVE AND OUTCOME

- Students will identify the importance of their family's past and compare it with the archaeological past.
- Students will write sentences about the importance of the past.

ACTIVITY

1. Prior to the activity, instruct students to bring two photographs representing an important family event, for example a family reunion, or a vacation, or a graduation party. Ask them to think about the picture's significance.

2. Divide the class into groups of four. Each student is a writer and a presenter. Instruct students to discuss their photos and their importance within the group. Allow up to 10 minutes.

3. Instruct students to trade photos with another group. Make sure all groups have traded. Next, each group should determine the meaning and significance of the other group's pictures. Each member will write sentences explaining the importance of one photo. Allow up to 10 minutes.

4. Each member then presents the

conclusions to the whole class. Ask them to explain clues from the picture that helped identify what that importance was. Ask the owner of the photo if the conclusions are correct and to add information.

5. Pass photos back to the owner. Instruct each student to answer these questions in their Arch Journal (write questions on board or overhead):

- ~ Why is it important to know about your past?
- ~ Why is it important to learn about the archaeological past?
- ~ What can we learn by studying the past?
- ~ What happens if special items from the past are destroyed?

EXTENSIONS

3–5:

- Research vocabulary.

See: Lesson 1D—Vocabulary

- Have students write a story about an event or a special object from their past. Place a twist in the story when the event or object disappears.

6–8:

- Have students research other cultures. Look for similarities and differences between their culture and the others. Ideas for research include types of foods eaten, family organization, and types of shelters.

LESSON 1E—NARRATIVE: WHO IS AN ARCHAEOLOGIST?

Dr. Thomas A. Foor is an archaeologist.

Dr. Thomas A. Foor, Missoula, is an archaeologist. Tom has been involved in archaeological fieldwork since 1970, and he even teaches archaeology. He says, "Archaeology is all about *the thrill of discovery*."

Tom has always read books about explorers and adventurers and has been interested in how humans became as we are today. Human diversity—how and why humans organize into groups—presents many questions for him. Some of the questions he asks are: Why aren't we all members of just one society? Why do we even live in groups? Why isn't there just one kind of society? Why isn't there just one way of making a living?

He searches for answers to his questions through the "time machine" of archaeology. Like the explorers he's read about who searched for people in new places, Tom explores people from historic and prehistoric times, using archaeology to transport him to the past. Archaeology allows him to look at how, why, and under what conditions new human societies or communities formed. He uses the artifacts, features, and ecofacts that people left behind to study their lives and answer his questions.

Tom loves both historic and prehistoric archaeology. The most numerous sites in Montana are historic and late prehistoric. The cultures studied at most prehistoric Montana sites show a well-developed record of family-based societies. These

sites are important to address specific concerns of how the human world works. When sites are well preserved and left undisturbed, they are valuable—and fun—to study. Early sites may represent ways of life for which we have no modern comparisons, ways of life that are now extinct! Tom hopes to find a complete and intact living floor from a prehistoric campsite. It would help him identify different groups who may have lived within the site.

Tom was born in Washington, D.C., and attended elementary and secondary schools in Montana and California. He received his Bachelor's and Master's degrees from the University of Montana. He obtained his doctorate from the University of California, Santa Barbara, and completed postdoctoral studies at the University of Michigan. In the past, Tom worked as the Montana State Archaeologist for the Montana Historical Society, Helena. Today, he is a professor of Anthropology at the University of Montana, where he guides archaeological students to do their best in searching for answers to the questions archaeologists ask.

Many instructors inspired Tom throughout his schooling. Dee C. Taylor, University of Montana, taught him the importance of being able to tell others about the excitement of archaeology. Albert C. Spaulding, University of California, Santa Barbara, taught him the significance of clear, logical, goal-oriented thinking, and concise communication. William

Duncan Strong, Columbia University, instructed him in the value of being a good writer. Clyde Coombs, University of Michigan, taught Tom the importance of using concepts that are measurable.

Tom's archaeological career began with work in the coal lands of southeastern Montana and north-central Wyoming. He found and excavated campsites, rock art sites, quarry sites, and bison kill sites. He has worked in locations near Great Falls and in western Montana. He has performed surveys and test excavations in Washington and Idaho, usually as part of cultural resource management projects. Tom has surveyed and excavated several California coastal sites, finding and investigating several large villages and shell middens. Middens are ancient garbage sites.

Tom has also worked in Western Europe, where he unearthed his most exciting find. When he was a student worker in France, he excavated a small statuette. Only about sixty-five statuettes of the kind he found have been discovered in Europe, from the east to the west. They all date from about the same time, the Upper Paleolithic period. Nobody really knows what they were used for, but they have many characteristics in common. If nothing else, these statuettes suggest that people all over Europe shared symbolic meanings long ago. Tom would love to find another!

Tom says that the best and most significant site is always the one he's currently working on. Tom is continuing seventeen years of work in

southwestern Montana's Centennial Valley, at the Tree Frog site. Tree Frog is a campsite with radiocarbon dates suggesting people lived there sometime in the past 300 years. Artifacts discovered at Tree Frog include pieces of a very distinctive type of pottery, arrow points made of volcanic glass (mostly from central Idaho), and historical trade goods like metal tools and a glass trade bead. The site is significant because it was occupied by people who were undergoing changes in how they defined their social identity. If those changes can be understood and interpreted, archaeologists are closer to answering their questions about human diversity.

As he studies the past, Tom is most intrigued with how Montanans were in indirect contact, or maybe direct contact, with members of other societies who lived all over North America. He is also amazed at the ingenuity shown by early Montanans in their use of the American bison.

Since archaeology is all about studying past human behavior, archaeologists must look for patterns. They then compare patterns of behavior that happened repeatedly and that resulted from similar conditions. They eliminate behavior that appears to have occurred randomly. Tom believes that the digital computer provides many remarkable and measurable tools to help recognize these patterns. He thinks these tools hold great promise for understanding people of the past.

It is very easy for Tom to get excited about archaeology. He loves his work. The toughest part of his work is giving low grades to students

who do not do very well. He suggests that you study human behavior if you are interested in archaeology. A great archaeologist must have insights into people and how they behave. Also, since archaeological data usually comes from the ground, study dirt. Sedimentology, the knowledge of how dirt accumulates and erodes, and soil sciences, which study what happens to dirt after it accumulates, are both basic requirements for an archaeologist. After you gain expertise in these areas, you can specialize in other areas including botany, zoology, ecology, chemistry, physics, art history, or geology. Broad knowledge in many areas creates the best archaeologists.

When asked what he believes the future holds for archaeology, Tom responds: "If we want to continue doing archaeology, we need to convince the public that our work is worthwhile. We must ask questions the public wants answered. Since tax dollars pay for most archaeology, we have to investigate sites most likely to provide answers to those questions. We have to spend our valuable money and time researching sites where we can accurately reconstruct events. I think the future is limitless for young, technically proficient archaeology students who are excited about people and human behavior!"

When he's not involved with an archaeological project, Tom's hobbies

are traveling, playing golf, fishing, hiking, and swimming. He is also an amateur radio collector. His family members are his father, a surgeon, and his mother, who works in public relations. His brother works in law enforcement, and his sister is a nurse. If you are interested in archaeology, you can contact Tom at:

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Tom Foor is an archaeologist. He teaches anthropology to students at the University of Montana, Missoula.