

Investigating the Puzzle House Pueblo

Instructions for the Teacher



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Investigation Materials

This investigation supplements *Project Archaeology: Investigating Shelter* (Letts and Moe, 2012), a curriculum that will enable students to complete the investigation. This investigation is divided into two parts: “Investigating the Puzzle House Pueblo: Instructions for the Teacher (this document)” and “Investigating the Puzzle House Pueblo: Archaeology Notebook” (separate document). You must have both documents and *Project Archaeology: Investigating Shelter* to teach the investigation effectively.

Instructions for the Teacher

This document contains all of the instructions you will need to conduct the investigation in your classroom plus some student materials that will be used in group activities. Within the instructions, two symbols will guide you to specific materials needed for each of the sections.

-  Refers to pages in the Archaeology Notebook.
-  Refers to pages or sections within the Instructions for Teachers.

Archaeology Notebook

The investigation contains all of the data sources and analytical tools the students will need to investigate a pueblo from historical, archaeological, and cultural perspectives. Ideally, each student should have a complete notebook of data and data collection sheets (Parts One – Four and the Assessment). Recognizing that providing each student with a complete notebook would require a lot of photocopying, we suggest the following alternatives:

- Make one notebook for each team of students.
- Have students print the notebook at home if possible. The quality of photographs would also be much better.
- Project the file on an LCD projector and work as a whole class.
- Have students work online, either individually or in teams.
- Have students answer questions in a journal or on separate paper instead of using the worksheets.

Teaching the Investigation

The investigation is comprehensive and uses the most authentic data sources available. It is organized into four instructional parts and an assessment, which can be separated and taught over several days.

- **PART ONE** provides background information on the environment of the pueblo site the students will be studying and presents an exercise in dendrochronology; students will also meet Ms. Deloria Dallas, a modern Hopi descendant of the Ancestral Puebloan People.
- **PARTTWO** presents how history, such as historic photographs and oral histories, can supplement archaeology to present a more complete understanding of people in the past.
- In **PARTTHREE** the students will work with artifacts and quadrant maps of the Puzzle House Pueblo site to make inferences about how the pueblo was used by the ancestral Puebloans who lived in it.



- **PART FOUR** connects the past with the present. Students learn the importance of preserving archaeological sites.
- The **ASSESSMENT** asks the students to write an essay describing what they have learned in the investigation and draw a modern-day shelter, which incorporates at least three ideas from the pueblo. The assessment also includes the “Final Performance of Understanding.”

The investigation may be completed as a jigsaw project by dividing Parts One and Two into sections. For example, you might divide the class in half. Assign groups of two to one of the following sections:

- Environment of the Puzzle House Pueblo
- The Pueblo in History

Each group completes the section assigned and reports their findings to another group who did the other section. The second group shares their information in a similar manner. The information gathered from each of these sections must be available to all students when they complete their assessments.

While there are no right or wrong answers, answer keys for each student activity provide you with examples of reasonable inferences the students might make. They also include information about how archaeologists interpreted the data.




Part One: Geography



Instructions for the Teacher

Materials

For Each Student



-  “Investigating the Puzzle House Pueblo: Part One” (Archaeology Notebook, pages 2-10)

For the Teacher

- Transparency of the pueblo photographs  (page 12) or project it with an LCD projector from the Web site.
- Additional illustrations and photographs of plants and animals for the  “Geographic Location of the Ancestral Puebloan People” (page 4)
- 26 feet of string or light rope

Preparing to Teach

Make a transparency of the historic photographs of the pueblos (page 12).

1. Make a copy of  “Investigating the Puzzle House Pueblo: Part One” for each student.
2. Download additional illustrations and photographs of plants and animals from the Web site for  “Geographic Location of the Ancestral Puebloan People”
3. Obtain 57 feet of string or light rope.
4. Post the essential question: “What can we learn about the lives of the Ancestral Puebloan people by investigating the Puzzle House Pueblo?”
5. Post the Word Bank words.

WORD BANK

ancestor: a person from whom one is descended; mother, father, grandmother, grandfather

Ancestral Puebloan People: The people who were the ancestors of the present Puebloan; also called the Anasazi.

autobiography: the story of a person’s life written by that person

descendant: a person descended from a particular ancestor; daughter, son, granddaughter, grandson

Pueblo: a Spanish word meaning “town.” This word is applied both to a style of building (adobe-and-stone pueblo) and to particular Indian groups (the modern Puebloans and the ancestral Puebloans).

UNCOVER PRIOR KNOWLEDGE

What can we learn about the lives of the Ancestral Puebloan people by investigating the Puzzle House Pueblo? Inform students that this question will guide their learning.

1. Tell students that they are going to play the role of an archaeologist as they investigate the pueblo, a type of shelter used by the ancestral Puebloan community.
2. Hand out folders to each student for organizing their papers.

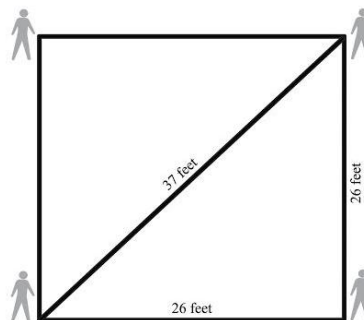



3. Write the word *pueblo* on a board and show the students a photograph of a pueblo 📄 (page 12) at the same time. Ask them:
- What does the design of the pueblo suggest about the materials the people used to build their shelter?
 - If students suggest the ancestral Puebloan people probably used wood and/or adobe, ask how might the ancestral Puebloans have built the pueblo using these materials?
 - How might the ancestral Puebloans have used their pueblo?

DISCOVER NEW KNOWLEDGE






Introduction

1. Go over the cover sheet information for 📄 **PART ONE** and look at the data sources students will use in their investigation.
2. Review the meaning of the word **culture** from Lesson Three. As a class, read Ms. Deloria Dallas's autobiography. As class members read aloud, demonstrate how to highlight important information in the text. Share your rationale for selecting each piece of information. Assist students in defining **autobiography, Ancestral Puebloan People, descendant, pueblo** and **ancestor** and adding them to their Word Banks.
3. Estimate the size of the Puzzle House pueblo using the following procedure:
 - a. Go outside as a class.
 - b. As a group estimate a square measuring 26 feet by 26 feet. Have a student stand in each of the four corners. Mark the estimated corners with pieces of ribbon or tape.
 - c. Have the rest of the students place themselves along the sides of the square.
 - d. To find out how accurate your estimate is, use the rope to measure the sides of the square. Have a student in one corner hold the end of the rope and another student hold the mark at 26 feet. The student holding the end then turns 90 degrees and another student hold the other end of the rope at 26 feet. Repeat the process until all corners have been marked accurately. Check your square by measuring the hypotenuse of 37 feet.
 - e. Have the rest of the students fill in the sides of the square. How close was your original estimate?
 - f. Ask students: How many people do you think could live in this pueblo? Take some answers and pick one for illustration (fifteen people). Ask for volunteers to go inside the space to represent that number of people actually living inside the pueblo. Would this number of people be crowded by our standards? Tell students to remember what fifteen people inside this space looked like as they continue to investigate the pueblo.



4. Teams of two will read together  “Geographic Location of the Ancestral Puebloan People” and then analyze the data. Project illustrations and photographs from the Web site on an LCD projector or post them around the room. Ask students: What do you think this section will be about? Have students jot down their thoughts or take a few answers from the whole class. Teams of two will read the section and analyze the data together.

Be a Dendrochronologist – Archaeology and Tree-Ring Dating

1. Read  “Dendrochronology” (pages 7-8)
2. Assist students in their  “Be a Dendrochronologist” activities (pages 6-10) and prepare to share the background information with students
 - a. Share background information. Project the “Master Sequence” transparency and explain how the sequence is created.
 - b. Using “The Stump” activity sheet or tree cookies, show students how to count tree rings and discuss the basic knowledge that can be learned from the study of tree rings.
 - c. Complete  “The Stump: Collecting the Data”
3. If possible, bring in an increment borer and a core sample. Foresters with state and federal agencies might lend these to you. Explain how the borer is used and how the sample can be read, as in “The Stump” activity.
4. Give each student a copy of the  “Be a Dendrochronologist” activity sheet. It depicts cross sections of two beams from different archaeological sites. Have students cut out the core samples. The students match their core samples to the master sequence. Glue the samples from each core onto the master sequence to see how the beams overlap and to date and place them in chronological order. (You may want to demonstrate or work along on the overhead projector.)
5. After students have dated the beams and put them in order, ask them to make some observations about the climate at these sites. What might have been the weather conditions at that time? How would the weather have affected farmers?
6. Working individually or in teams, have students complete  “Be a Dendrochronologist: Analyzing the Data.”
7. Share preservation information from the “Background Information.”
8. Ask the students to summarize the importance of tree-ring dating in archaeology. Why is it importance to preserve wood samples in archaeological sites?

Answer Key for “Geographic Location of the Ancestral Puebloan People: Analyzing the Data”

1. Four Corners area (New Mexico, Arizona, Utah, Colorado); now Puebloan people live all over the U.S., but many choose to stay in the Four Corners region (mostly in New Mexico and Arizona)
2. Students should use text, photographs, and illustrations provided to draw a landscape of the Four Corners region. It doesn't need to be accurate; the goal is to make the place more concrete.
3. 24 degrees in the winter and 100 degrees in the summer.
4. An insulated shelter that stays warm in the winter and cool in the summer.



The Stump Activity Sheet Answers

This tree was cut three years ago. Write that year _____. (i.e. $2015 - 3 \text{ years} = 2012$)

How old is the tree? 16 years old

What year did the tree start growing? The year it was cut minus 16. (i.e. $2012 - 16 = 1996$)

In what year of growth was there the least rainfall? 6

In what year of growth was there the most rainfall? 8

Be a Dendrochronologist Activity Sheet Answers

1. Climate and the years the site was occupied.
2. It could be skewed. However, if archaeologists find that some beams date well before the others at a site, they would suspect that the early beams had been re-used.
3. Removing beams removes information about the site's date and climate. Moving beams around confuses the record, and archaeologists cannot then tell to which room the dated beam belongs.
4.
 - a. Which beam is the oldest? B
 - b. How old was Tree A when it was cut? 14 Tree B? 13
 - c. How many years ago did Tree A start growing? 990 in 1025 A.D. Tree B? 999 in 1034 A.D.
 - d. How many years ago was Tree A cut? 977 in 1038 A.D. Tree B? 987 in 1028 A.D.
5. Tree A: dry cycles – 0, wet cycles – 2
Tree B: dry cycles – 2, wet cycles – 2
6. Examples: availability of food, water, and other resources might change; survival might depend on adapting to these changes; human populations might change.





PROJECT ARCHAEOLOGY

Discover the past—shape the future

Project Archaeology: Investigating Shelter Series

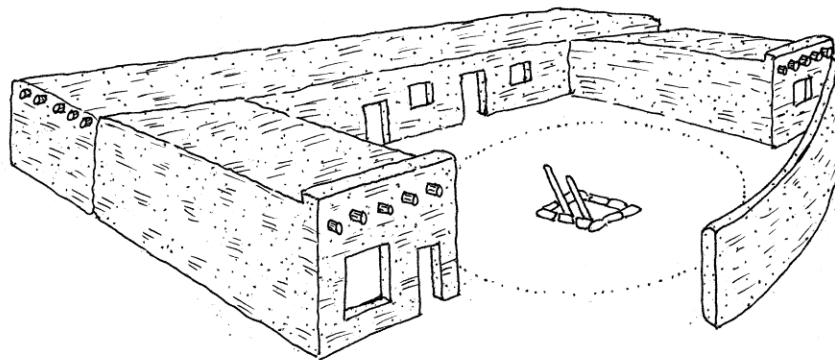
No. 7 Investigating the Puzzle House Pueblo

Investigating the Puzzle House Pueblo

Archaeology Notebook

Name of Student Archaeologist

Archaeology can uncover a lot of information about people in the past, but it only tells part of the story. In this investigation you will learn what other stories can be told by studying geography, tree rings, and history. You will use and compare these different forms of **evidence** to learn about the Puzzle House Pueblo and the people who lived there. You will look at historic photographs and read oral histories. You will make a map of an archaeological site and classify artifacts. You will infer how the geographic area of the southwest shaped the Puzzle House pueblo. You will use what you learned about the pueblo to plan and draw a modern or futuristic shelter. In a final composition you will report what you learned.



Investigating the Puzzle House Pueblo

Part One: Geography

Archaeology Notebook

You are an archaeologist. Your question is:

What can we learn about the lives of the Ancestral Puebloan people by investigating the Puzzle House pueblo? What can we learn about the Puzzle House pueblo and the Ancestral Puebloans by studying the land/environment around them?

Investigation Activities

1. Estimate the size of the Puzzle House pueblo with your teacher and other students.
2. Read an **autobiography** of Ms. Deloria Dallas, “Meet Ms. Deloria Dallas, a Descendant of the Ancestral Puebloan People” (page 3).
3. Read “Geographic Location of the Ancestral Puebloan People” (page 4).
4. Complete Data Collection Sheet “Geographic Location of the Ancestral Puebloan People” (page 5).
5. Have your teacher lead you in the “Be a Dendrochronologist” exercise.

Data Sources

The article “Geographic Location of the Ancestral Puebloan People” (page 4).

Word Bank

ancestor: a person from whom one is descended; mother, grandfather, great-grandmother

Ancestral Puebloan People: people who were ancestors of present Puebloan people, also called the Anasazi

archaeology: the scientific study of past human cultures through artifacts and sites

autobiography: history of a person’s life written by that person.

descendant: a person descended from a particular ancestor; daughter, grandson

culture: the customs, beliefs, laws, ways of living, and all other results of human work and thought that belong to people of the same society

dendrochronology: The study of tree rings to determine the dates of events; dendrochronology studies the biography of a tree

pueblo: A Spanish word meaning “town.” This word is applied both to a style of building (adobe & stone pueblo) and to particular Indian groups (modern Puebloans).



Meet Ms. Deloria Dallas A Descendant of the Ancestral Puebloan People

My name is Deloria Dallas. I am a member of the Hopi tribe located in northeastern Arizona. I am *maaswungwa*, a Hopi name for the fire and ghost clan, and my father is *honanwungwu*, or badger clan. I am the youngest of six children. I myself have a son and my husband is from the bear clan.

I graduated from Northern Arizona University with a Bachelor of Science degree in Applied Indigenous Studies with an emphasis in Cultural Resource Management. I am currently working on my Master of Arts in Secondary Education through the University of Phoenix. I also teach U.S. Government and World History at Tuba City High School.

My family and I live with my parents in Lower Moencopi Village. On the Hopi reservation people live in villages on top of first, second, or third Mesas. Lower Moencopi Village is located on third mesa. Originally my family came from a village called Old Oraibi, which is also a village on third mesa.



Ms. Deloria Dallas near her home in Arizona. *Photograph courtesy of Deloria Dallas.*

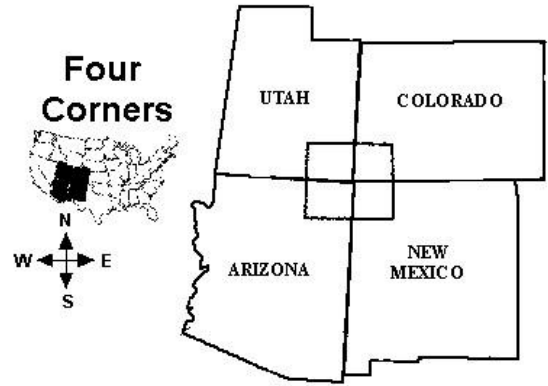


Ms. Deloria Dallas in her native costume. *Photograph courtesy of Deloria Dallas.*



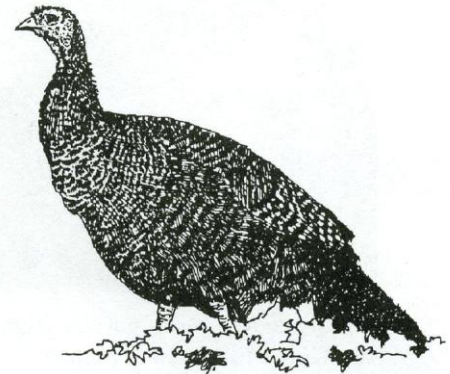
Geographic Location of the Ancestral Puebloan People

The earliest Puebloan people lived in what is now called Colorado, Utah, Arizona, and New Mexico. This area is often called the Four Corners region. Hundreds of years ago, the land was covered with many different shrubs and plants, including pinyon pine, Utah juniper, and one-seed juniper. Today much of the land is cleared for farming.



Deer, big horn sheep, wolves, and turkeys used to live in the Four Corners region. Smaller animals like rabbits, squirrels, and other rodents also lived there. Many of these same animals still live there today.

The Four Corners region has a wide range of temperatures and rainfall. The average temperature in the winter is about 24 degrees Fahrenheit. In the summer, the temperature can reach 100 degrees Fahrenheit. This region receives most of its rainfall from mid-July to mid-September, and receives most of its snowfall from mid-December to mid-March. There are long dry seasons between the wet months.



Turkey

Today the Puebloan people live all over the United States, but many still live in the Four Corners Region. Puebloan people work in many jobs including education, law, and medicine. They also participate in **cultural** events that honor their history and observe Puebloan spiritual practices.

View of Puzzle House in the field before excavation. Photograph courtesy of Fort Lewis College.



Name _____

Geographic Location of the Ancestral Puebloan People: Analyzing the Data

1. Where did the Ancestral Puebloan people live in earlier times? Do they still live in the same places today?

2. Draw a picture below that shows what the landscape in the Four Corners region looks like. Label each part of the landscape.



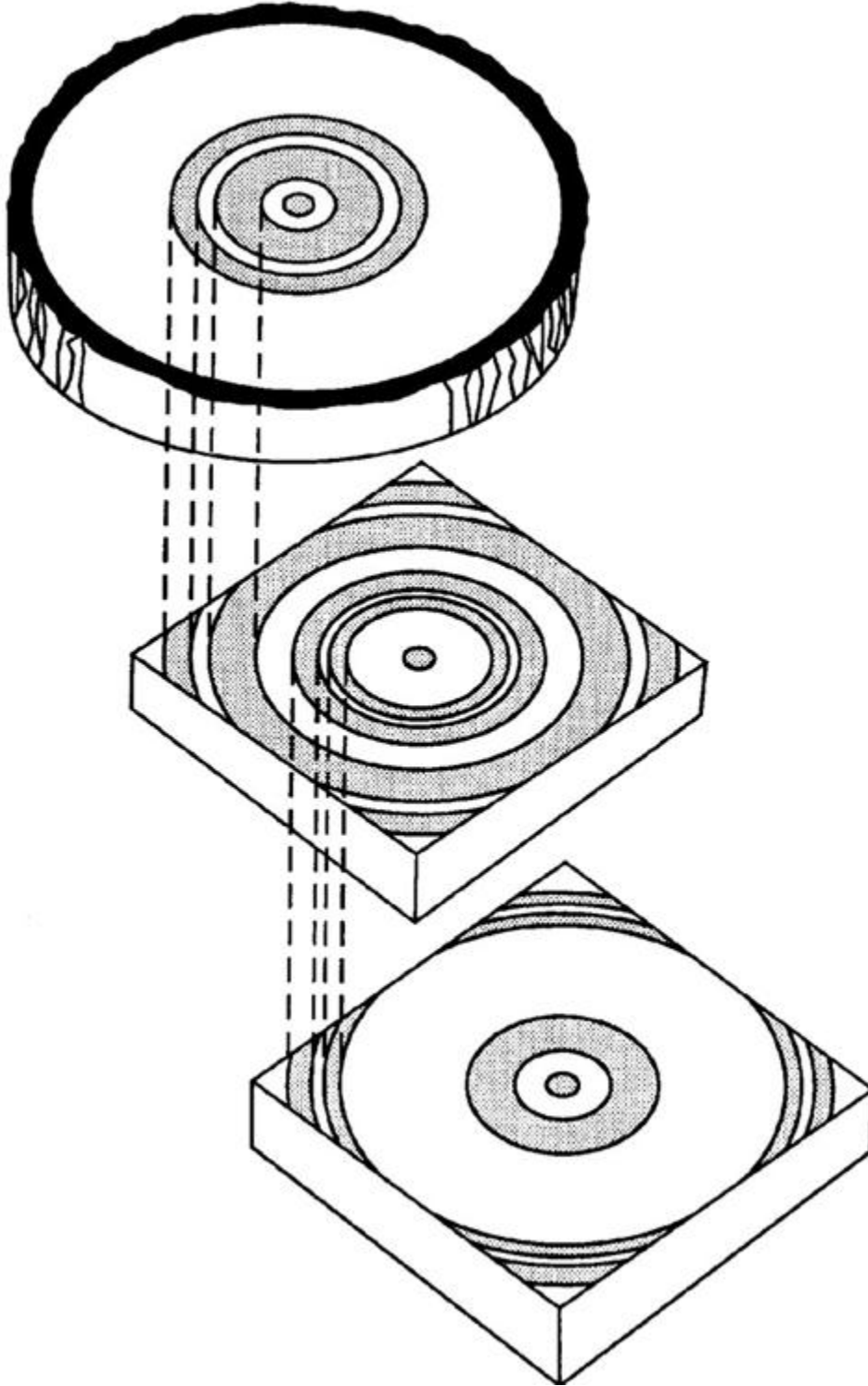
3. In degrees Fahrenheit, how cold can it get in the winter in this area? In degrees Fahrenheit, how hot can it get in the summer in this area?

4. What kind of shelter do you think would be needed for this climate?

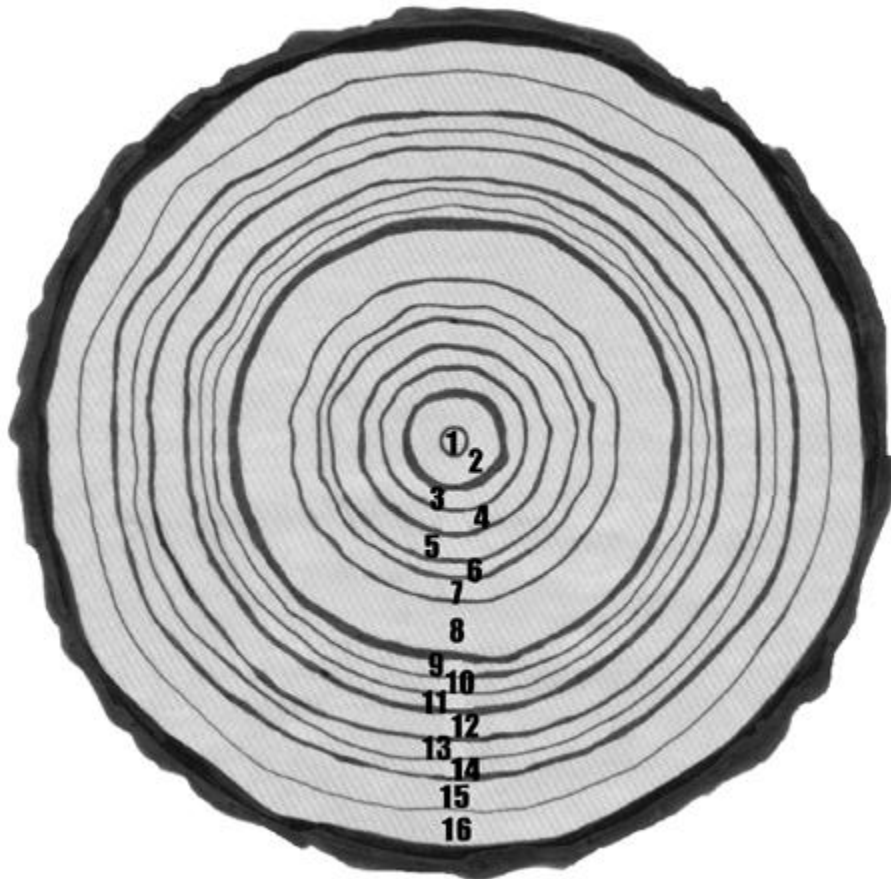


Dendrochronology – Be a Dendrochronologist!

Master Sequence



The Stump



The Stump: Collecting the Data

Name: _____

This tree was cut 3 years ago. Write that year:

How old was the tree?

What year did the tree start growing?

Find the ring that grew the year you were born. Was it a wet or dry year?

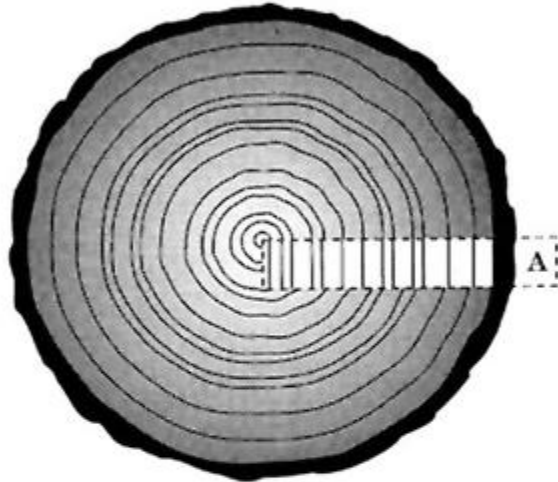
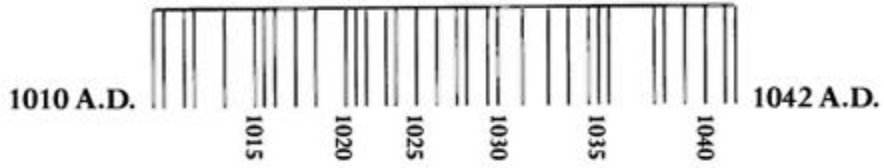
In what year of growth was there the least rainfall?

In what year of growth was there the most rainfall?



Be a Dendrochronologist

Be a Dendrochronologist



Be a Dendrochronologist: Analyzing the Data Name: _____

1. Refer to the diagram on your **Be a Dendrochronologist** sheet and answer the following questions:

- Which beam is the oldest? _____
- How old was Tree A when it was cut? _____ Tree B? _____
- How many years ago did Tree A start growing? _____ Tree B? _____
- How many years ago was Tree A cut? _____ Tree B? _____

2. Answer the following:

Tree A:

List the number of dry cycles (two or more dry years)? _____

List the number of wet cycles (two or more wet years)? _____

Tree B:

List the number of dry cycles (two or more dry years)? _____

List the number of wet cycles (two or more wet years)? _____

3. How might climate changes have affected the lives of the people who lived at Puzzle House?

4. Name two things archaeologists can learn about an archaeological site from tree rings.

5. Using the data from Tree Rings A and B, how might you account for the difference in ages of logs that were used in Puzzle House? How might this information help us understand how people lived at Puzzle House?

6. What happens to the archaeological record if someone removes a beam or even places it somewhere else on the site?

