

## Cultural Findings at Meadowcroft Rockshelter GigaPan Lesson

An exploration of Cultural Periods at Meadowcroft Rockshelter

**Summary:** This lesson uses the *First Peoples* GigaPan images to investigate the cultural periods represented at Meadowcroft Rockshelter. The GigaMap for this activity draws strictly on the *Culture tabs* of the image, while the interest points highlight the **strata** that contained evidence of cultural shifts. The GigaMap uses a descending chronological approach that simulates what the archaeologists encountered as they investigated.

### Students will:

- Differentiate between the types of **artifacts** that represent New and Old-World technologies
- Describe how stratigraphy helps archaeologists understand the cultural **sequence** at Meadowcroft Rockshelter
- Infer cultural patterns based on evidence and **context**
- Describe the shift in the prehistoric toolkit from Paleo-Indian times through the Woodland period
- Identify Stratum IIa as the most significant **cultural assemblage** at Meadowcroft and give examples of the evidence found there
- Infer how **radiocarbon dating** supports stratigraphy in the assignment of a cultural period
- Define the Clovis and Pre-Clovis Paleo-Indian **cultures**
- Explain the concept of continuity at Meadowcroft Rockshelter and infer the significance of continuity in **prehistory**

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**Timing:** 40 minutes

### Materials:

Writing Instruments  
Paper  
Internet Access

### Optional Reference Materials:

*First Peoples Teacher's Guide to Cultural Findings*

Prehistoric Cultural Periods Chart or Table

Stratigraphic Profile of Meadowcroft Rockshelter Table

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## Terms

Assemblage  
Basketry  
Ceramics  
Lithics  
Perishables  
Radiocarbon Dating  
Sequence  
Stratigraphy  
Technology

## Concepts

Law of Superposition  
Continuity and Change  
Scientific and Relative Dating

## Identification Significance

Meadowcroft Rockshelter  
Woodland Period  
Archaic Period  
Paleo-Indian Period  
Clovis  
Pre-Clovis

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## Background Information

Meadowcroft Rockshelter's significance lies with the **stratigraphy** of the site: hidden within the eleven natural **strata** is a continuous but intermittent record of **cultural activity**. Applying the **Law of Superposition**, archaeologists safely assume that any **cultural evidence** is where it was deposited by prehistoric peoples, with the oldest evidence being deepest and the newest on top.

Fifty-two **radiocarbon dates** anchor the stratigraphic **sequence**. The calibrated ages for these assays support a **Woodland period** ascription for Strata XI-IV (upper), an **Archaic** ascription for Strata IV (middle)-IIb, and a predominately **Paleo-Indian** ascription for Stratum IIa. In short, the calibrated dates from Meadowcroft support a complete **sequence** of every major prehistoric cultural period in North America, including major cultural transitions such as crop domestication.

Prior to the **excavation** of Meadowcroft Rockshelter, the accepted "First Peoples" were the Paleo-Indian Clovis **cultures**, named for a set of distinctive stone tools associated with Pleistocene **fauna** discovered near Clovis, New Mexico, and **radiocarbon dated** between 11,500 and 11,000 YBP. However, in Stratum IIa at Meadowcroft, archaeologists encountered **ecological** data and **cultural materials** dubbed the "Miller Complex" (including **basketry**, a modified wood spear foreshaft, a notable **lithic assemblage**) that were stratigraphically below Paleo-Indian **cultural materials** that were **radiocarbon dated** to the same time as Clovis. These materials have been **radiocarbon dated** between 16,175 and 11,300 years ago, registering a cultural presences at least 4,000 years before Clovis. On top of that, the **lithic assemblage** of the so-called Miller Complex looked very different than Clovis **assemblages**. These **Pre-Clovis** Paleo-Indian finds are the most significant **cultural materials** at Meadowcroft

Meadowcroft was the first archaeological site to publish Pre-Clovis materials, giving rise to new theories about how and when North America was peopled. The fact that there remains a substantial unexcavated portion of early and later levels means the site has the potential for others to test the existing interpretations of the site and to yield even more data on the

early inhabitants of the United States. Since publication of Meadowcroft's Pre-Clovis component in the 1970s, other sites using similar **methodologies** have reported similar findings in **artifacts**, stratigraphy, and **radiocarbon assays**. Together these sites demonstrate that prehistoric people were active in North America *at minimum* 5,000 years before Clovis peoples. Meadowcroft Rockshelter remains a critical piece of evidence in the understanding of these first peoples.

**Procedure:**

1. Teachers should begin the lesson by offering an introduction; one possible activity suggestion is below. If you have not already done so, provide an introduction to Meadowcroft Rockshelter, identifying the site, explaining its significance, and why you are studying it. Review the

**Lesson Introduction Activity:** Project the *Exterior Image* for one minute. Ask students to write down everything they see that would indicate that Meadowcroft is a good place for humans to camp.

2. Emphasize that throughout its long **history**, Meadowcroft Rockshelter has been used as a short-term bivouac, or camp, for people passing through the area. This exercise will examine the stratigraphy of the site to demonstrate how technology indicates cultural shifts throughout various cultural occupations. Use the GigaMap on the following page to advance this discussion.

Cultural Sequence						
GigaPan Image	Tab	Point #	Title	Content Description	Multimedia/ Visual	Transitions
Lower	Culture	1	Carya sp.	Favored resources may have changed over time, but the Rockshelter was always used as a temporary camp for hunting and gathering.	37s video on the dietary evidence from the Rockshelter.	Evidence from the site indicates that people with Old-World technologies, such as glass and metals, camped at Meadowcroft during the time period when George Washington was alive . . .
Lower	Culture	2	Stratum XI	The top layer of the site houses historic materials such as glass and metal.	Photograph taken of the site before <b>excavations</b> began in 1973.	The stratigraphy immediately adjacent to the Historic Period indicates that native peoples visited the site less often and for shorter periods . . .
Lower	Culture	3	Stratum IX	The presence of triangular arrowheads and <b>radiocarbon assays</b> date this <b>stratum</b> to the late Prehistoric period.	A portion of the corn remains found at the Rockshelter.	Technologies and agricultural practices probably contributed to the decrease in occupations at Meadowcroft . . .
Lower	Culture	4	Stratum IV	Pottery shows up in greatest concentration here in Stratum IV. A <b>ceramic</b> industry is the hallmark of Woodland <b>culture</b> , and 14C tests date it to the Early Woodland.	The term sherd is used to distinguish a fragment of pottery from one of glass or stone.	Earlier technologies, such as <b>basketry</b> , are evidence of more transient cultural groups . . .
Lower	Culture	5	Stratum III	Simple plaited <b>basketry</b> shows up throughout the cultural <b>history</b> of Meadowcroft.	This is a picture of the largest basket piece found at the site before it was removed.	It is also quite likely that as the Rockshelter matured and the roof receded, there was less occupational space for humans to utilize . . .
Lower	Culture	6	Stratum IIb	Stratum II was divided into	A table listing	The earliest people to occupy the site took

				two substrata due to a large roof spalling event. The upper portion, IIb, shows a slightly more developed tool kit and a change in diet.	major <b>cultural features</b> excavated by <b>stratum</b> .	maximum advantage of the ample resources and shelter afforded in the Cross Creek Valley. Their toolkit is evidence of small-game foraging societies . . .
Lower	Culture	7	Stratum IIa	The lower unit of II houses the oldest materials recovered. Stone (chert) seems to be the medium of choice for tool construction, but <b>perishable materials</b> like wood and bone can disappear from the archaeological record through decay.	<b>Lithic materials</b> recovered from Stratum IIa. From left to right: the Miller Lanceolate point, a prismatic blade, utilized flakes, a Mungai knife.	Prior to <b>excavations</b> at Meadowcroft, archaeologists assumed that all Paleo-Indian <b>cultures</b> were big-game hunters, as evidenced by Clovis sites in New Mexico. However, evidence from Meadowcroft Rockshelter demonstrated that Pre-Clovis <b>cultures</b> were in fact small-game hunters.
Lower	Culture	8	Deer Bone	Meadowcroft shows a lifestyle and subsistence strategy very different than big-game hunting as seen in many Clovis sites. Although still nomadic, the Miller Complex and subsequent visitors were systematic small-game foragers.	34s video on the people of the MCRS.	<b>Conclusion:</b> The stratigraphy at Meadowcroft Rockshelter displays a remarkable continuity: all prehistoric cultural groups left evidence of short-term occupations, primarily with the objective of gathering food. The toolkits of these peoples indicate minor technological advances as occupational patterns changed as time marched toward the Historic Period and the Rockshelter itself evolved.

### Alternate Delivery Options:

- Use the GigaPoints above to create a worksheet or scavenger hunt for your students. Give them time to explore the images on their own, completing their worksheets as they go.
- Give students KWL charts to complete as you view the images. During the introduction have them record everything they Know about the *Exterior image* (or of the *Lower Image*, if you prefer it). Then ask them to write what they Want to know. After you view the images, ask them to write what they Learned. Address any questions that remain unanswered. What sources can students use to answer these questions?
- Assign each student or group of students to a **stratum**. Have them investigate the GigaPoint for their topic. Each student or group should write a summary of the point. When students have completed this task, give them the opportunity to present in chronological order (ascending or descending, whichever the teacher prefers). Each group will need to create a transition that links the information presented immediately before them. The teacher can present the introduction and conclusion, or ask the students to work together to determine what the proper conclusion is based on what students learned.

### Post-Activity Enrichment

#### Activities:

- Assign each student or group of students a cultural period or **stratum**. They should draw a picture of what life may have looked like at Meadowcroft for their stratum, using information from the GigaPan image exploration to inform their creation. Afterwards have each group present their image without telling what their **stratum** is. The class should vote to determine what **stratum** the image represents. Proceed through the **stratum**, arranging the images in a **sequence** based on the class votes. When the **sequence** is complete, correct

any inconsistencies. Ask the students to examine the images. What can we conclude about prehistoric life at the site based on this **sequence**?

- Work as a class to construct an exhibit or bulletin board about the cultural **sequence** at Meadowcroft. Decide how you will organize the exhibit. Create a thesis statement and supporting evidence. Use the screenshot function to capture images of the Rockshelter. Have students write captions for the images. Display your exhibit for other to enjoy.
- Have your class make posters with the theme of *The First Americans*. Use evidence from the GigaPan to illustrate the posters. Alternately, create two sets of posters, “The Clovis Paleo-Indians” and “Pre-Clovis Paleo-Indians”. Use evidence from the Rockshelter to illustrate the Pre-Clovis posters. Conduct research about the Clovis people to appropriately represent this culture.

#### **Discussions:**

- Continuity is a major theme for the understanding of culture at Meadowcroft Rockshelter. Minor technological changes and the frequency and duration of occupations reveal cultural shifts throughout the long **history** of the site; however, the primary motivation for visiting seems to have been the availability of shelter and food. Discuss the implications of this pattern for **archaeology**. What does this tell us about cultural **history**?
- Dates aside, the presence of pre-Clovis **cultural evidence** at Meadowcroft rocked the archaeological world with the implication that 1) the **climate** was more **temperate** than previously thought and 2) Pre-Clovis peoples practiced small game foraging rather than megafaunal hunting. Discuss how the evidence contributed to a rethinking of prehistoric North American cultures.

## Readings:

John Boback, "[The First Western Pennsylvanians](#)," *Western Pennsylvania History* 91:1 (Spring 2013): 37-47.

This profusely illustrated article explores the lifeways of native peoples in western Pennsylvania over 16,000 years, clearly articulating major cultural transitions such as that from foraging/ hunter-gatherers, to agriculture, and ultimately through the emergence of Europeans in Pennsylvania. The article demonstrates the commonalities between prehistoric people and people today: the search for food, shelter, etc. Illustrations include images of the Rockshelter, reenactments of Native lifeways and maps that explore peopling theories. The article is useful for students/ teachers seeking to understand a narrative of prehistoric life and culture. The article's conclusion presents an overview of what happened to the Native Peoples who occupied the Rockshelter and theories about where they went.

David R. Scofield, "[The Real Paleo Diet: What's for Prehistoric Dinner](#)," *Western Pennsylvania History* 94:4 (Winter 2013): 4-5.

This fun article explores the diet of prehistoric Paleo-Indians who camped at Meadowcroft Rockshelter through an investigation of the food remains found at the site. Nuts, seeds from fruits and berries, redbud, corn, bones from mammals, birds, fish, and amphibians, shells from gastropods and mollusks, and egg shells constitute just a sampling of the foodstuffs available. Images of these food sources as viewed on the Meadowcroft property today provide an interesting comparison to archaeological data.

Anne Madarasz, "[Chapter 1: A Fertile Land for Development](#)," *Western Pennsylvania History* 92:1 (Spring 2009): 5-15.

A beautifully written article that walks the reader through **history** from 16,000 years ago to within the past 150 years, focusing on the resources offered by the land and key individuals who utilized them. The first two individuals highlighted are a Paleo-Indian tool maker and Queen Aliquippa, portraying two very different periods of Native American **history**. The article is useful for providing a chronological overview that demonstrates how continuity characterized the prehistoric period while change characterizes the Historic period.



Michael B. Collins, "[Meadowcroft: Shelter in a Storm](#)," *Western Pennsylvania History* 89:2 (Summer 2006): 46-51.

Collins focuses on the storm of controversy surrounding the Pre-Clovis findings at Meadowcroft Rockshelter, and the upsetting of the Clovis-First theory. As Collins states, "Very little in **archaeology** is absolute and immune to challenge, especially archaeological dating." He proceeds to detail the establishment of the Meadowcroft **chronology**, citing stratigraphy, **radiocarbon dating**, and **artifacts** as evidence. He also cites **geological**, **geographical**, and **ecological** data that contribute to interpretations of the site.

The article is very useful for demonstrating how archaeologists use evidence to challenge existing theories and to develop new hypotheses. It also demonstrates the necessity of **methodological excavation**, meticulous analysis, and, ultimately, the need for publishing. The article makes an excellent point about scholarly inquiry: articles present information but often rehash what is already known; a **monograph** that reveals, synthesizes, and integrates the full data and **methodology** is essential for quelling debate and advancing science.

### **Other Cultural Findings GigaMaps to explore**

The GigaMaps on the following pages offer additional archaeological themes and sequences to explore in the *First Peoples* GigaPan Images. The transitions column is left open so that you can build your own transitions or customize the table as a worksheet for student use.

#### **They include:**

- Cultural Evidence
- Foodways
- Peopling Theories

### **Cultural Evidence:**

We know about the activities of prehistoric cultural groups because of the evidence they left behind. This GigaMap guides the learner through an exploration of key **cultural evidence** that was used to interpret the cultural **sequence**.

Culture - Cultural Evidence						
GigaPan Image	Tab	Point #	Title	Content Description	Multimedia/ Visual	
Front	Archaeology	4	Historic Firepit	The evidence archaeologists find can be broken into two categories: <b>cultural features</b> , and <b>artifacts</b> . <b>Artifacts</b> show what people had with them while visiting the Rockshelter, and <b>features</b> are an important clue as to what activities people were undertaking while here. Combining the two lines of evidence gives a glimpse of the lives of the occupants.	47s video on the site as it was in 1973.	
Firestack	Archaeology	4	Post-mold	When people dig a hole, regardless of size, it disturbs the natural stratigraphy, leaving this disruption as evidence of the activity. This hole was dug for an unknown reason.	A photograph taken of a post mold found at this location.	
Firestack	Archaeology	6	Charcoal	Firepits and associated charcoal remains are extremely important to <b>archaeology</b> . The presence of a hearth is evidence of human occupation, its	1m 14s video on dating the <b>cultural evidence</b> .	

				location within the stratigraphy relatively dates the occupation, and the charcoal can be <b>absolutely dated</b> using the <b>radiocarbon method</b> to find a date that the fire was burning.		
Firestack	Archaeology	7	Deer Bone	Not everything found on an archaeological site is cultural in origin. Sometimes it can be hard to tell if an item is an <b>artifact</b> or an <b>ecofact</b> like this bone of a white-tailed deer.	This bone punch has evidence of being crafted into a tool.	
Upper	Archaeology	3	Mollusk Shell	This particular mollusk shell was found inside of a firepit, which means there's a good chance that it was eaten by a human.	A table of freshwater taxa found by <b>stratum</b> .	
Upper	Archaeology	4	Deer Bone	As organic material bone is apt to decay over time, so it is found in lesser quantities than non- <b>perishable materials</b> like stone. However, bone was found to have been turned into a variety of implements.	Some of the bone tools found during the <b>excavation</b> .	

## Foodways:

Throughout the cultural **history** of the Rockshelter, people visited with the primary objective of gathering food. This GigaMap offers a sequence for investigating some of the major bodies of evidence from the **excavation** that reveal the foodways of prehistoric people. Use "[The Real Paleo Diet: What's for Prehistoric Dinner](#)" article to supplement this discussion.

Culture- Foodways GigaMap						
GigaPan Image	Tab	Point #	Title	Content Description	Multimedia/ Visual	
Exterior	Ecology	1	Cross Creek	Cross Creek provided people with easy access between the Ohio and Monongahela River valleys.	51s video on the <b>geography</b> of the MCRS.	
Exterior	Ecology	4	Oak Tree	Nut bearing trees were an important reason people stayed at the Rockshelter. There is evidence of walnut, hickory but, and acorns being processed and consumed at the site. However, for much of its <b>history</b> hackberries were the most widely used resource.	Table of the nut shell remains found in the Rockshelter by <b>stratum</b> .	
Exterior	Ecology	6	Spring	The freshest water available at the site was from the multiple springs located around the Rockshelter.	A close-up of the spring located just west of the Meadowcroft Rockshelter.	
Lower	Archaeology	1	Carya sp.	Regardless of time and culture, the Rockshelter	37s video on the dietary evidence	

				was also used as a temporary camp for hunting and gathering.	from the Rockshelter.	
Upper	Archaeology	3	Mollusk Shell	This particular mollusk shell was found inside of a firepit, which means there's a good chance that it was eaten by a human.		
Upper	Archaeology	4	Deer Bone	As organic material bone is apt to decay over time, so it is found in lesser quantities than non- <b>perishable materials</b> like stone. However, bone was found to have been turned into a variety of implements.	Some of the bone tools found during the <b>excavation</b> .	

## Peopling Theories:

The publication of Miller Complex Pre-Clovis Paleo-Indian materials from Stratum IIa forced archaeologists to confront evidence that the Clovis theory did not likely explain the peopling of the Americas.

This GigaMap provides a sequence for exploring some of the major theories about the peopling of North America.

Use the following articles to supplement this discussion:

James B. Richardson, III, "[Peopling the New World: The View from South America](#)" article

John Boback, "[The First Western Pennsylvanians](#)" article

J.M.Adovasio and Jake Page, "[Searching for the First Americans: a 500 Year Quest](#)" article

David Scofield, "[The Peopling of America](#)" article

Michael B. Collins, "[Meadowcroft: Shelter in a Storm](#)" article

Culture- Peopling Theories GigaMap						
GigaPan Image	Tab	Point #	Title	Content Description	Multimedia/ Visual	
Lower	Archaeology	1	Deep Hole	The <b>Law of Superposition</b> states that deeper <b>strata</b> are older than those above. This means that as archaeologists dig down, they are moving back in time. Meadowcroft's sediments offers glimpses into life over a very long time.	48s video on the lower deposits of the Rockshelter.	
Lower	Archaeology	2	Clovis Horizon	Since the 1930s peopling theory has been dominated by the Clovis Theory; the thought that people migrated into North America following mammoth herds south through Western Canada as glaciers receded.	49s video on the Clovis Theory.	
Lower	Archaeology	3	Miller Situ.	The Miller Complex is the culture of Meadowcroft's pre-Clovis occupation. They left behind evidence of a lifestyle quite different than megafaunal hunting.	1m 43s video on the Paleoindian component of the Meadowcroft Rockshelter.	
Lower	Archaeology	4	Pleistocene Hearth	Human occupation of the Rockshelter stretches back to the Pleistocene, thousands of years before firmly dated Clovis points.	1m 4s video on early peopling theories.	

