



Theme **2**

ANCIENT ORIGINS AND PEOPLE

The Beginnings of the Earth and Prehistoric Human Habitation

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LESSON 2A—NARRATIVE: WHAT IS THE EARTH'S ANCIENT ORIGIN?

You must know something about past time in order to understand how archaeologists study the ancient people of the **New World**. The New World is our land in the Western Hemisphere. The past includes your family's arrival in Montana, Montana's beginnings as a state, and even our country's start—but past time goes much further back than that. Travel to the past time when explorers from the **Old World** of the Eastern Hemisphere—Europe, Asia, and Africa—arrived in North America. Continue further back to learn about former Old World civilizations like Rome, Greece, and Egypt. You can study past events through research in written materials. This is known as the study of history. A great amount of written material describes our world's history. Our history appears to cover a large amount of time. But actually, the portion of time that involves humans on Earth is extremely small.

Travel even further back in time, to thousands and thousands of years ago, before the existence of writing. This is known as prehistoric time. No written records exist to study prehistoric time, but you can still study it by researching artifacts, ecofacts, and features. These items provide clues that allow archaeologists to develop theories, or ideas, of early human life, as we've already discussed in Lesson 1A.

Now, travel even further back in time, millions and millions of years. Scientists in other fields besides archaeology study the past before human prehistory. Some scientists gain

Our ancient earth is more than four billion years old.

knowledge of the earth's **origins**, or beginnings, by studying the earth's rocks and strata. This study is known as **geology**. Other scientists study **fossils**, the hardened remains of very ancient plant and animal life found in geological formations. The study of fossils is known as **paleontology**. Many of the techniques used by geologists and paleontologists are similar to those used by archaeologists.

Long before humans appeared, a vast array of other life forms roamed the earth's ancient land and seas. Environmental conditions changed radically through those millions of years. Deserts stood where forests now grow. Great inland seas and steamy swamps covered landscapes that we now know as plains. During some periods, intense cold surrounded our planet, while during others, the earth experienced severe heat. Dramatic shifts in climate and weather led to changes in habitat, or the places where plants and animals normally live. **Flora** and **fauna**, or plants and animals, adapted to the changing conditions when they could. If the struggle to exist was too great, they became **extinct**, or disappeared completely, while other plants and animals were able to survive. True extinction is a natural event that happens when ecological conditions collapse. The transformation, or change, in living organisms over time as they struggle to adapt is known as **evolution**. As scientists study Earth's evolution, they gather information about the past.

Geologists study rocks and strata so that they can understand the earth's story in time. They search for clues in three types of rock: **sedimentary** rock, **igneous** rock, and **metamorphic** rock. Sedimentary rock originates when sand, soil, and silt settle to the bottom of bodies of water. Layers of sediment accumulate through time. Thousands of years pass as the sediment hardens into sedimentary rock. Igneous rock has its origins deep inside the earth. It begins as **magma**, or hot and molten rock. Internal pressures force magma through cracks and fissures until it reaches the earth's surface, sometimes violently in the form of an erupting volcano. Once at the surface, magma cools and hardens into igneous rock. Metamorphic rock is rock that was once igneous or sedimentary rock. Great pressure and heat, over long periods of time, cause changes in the rock's mineral content, and it transforms into metamorphic rock. Like archaeologists, geologists study the strata of the earth's crust to determine the **chronology**, or order in time, in which geological events happened. The **geologic time scale** represents this order of events.

You can see significant changes in life forms in the geologic record. Paleontologists are interested in the fossils preserved in sedimentary rock. A fossil was once a living organism that is buried in layers of sediment. If it was an animal, its flesh rotted, leaving behind bones and teeth. Soil, silt, and sand buried the remains. Over thousands of years, the remains of the living organism hardened into rock. This fossil record of prehistoric plants and animals helps us understand

evolution. Paleontologists identify the fossil record according to geological time.

As scientists conduct research, they create theories about earth's evolution. One theory believed by many is **continental drift**. The continental drift theory explains the huge changes that the earth's surface has undergone. Before the continents had their present locations, the theory states, one giant supercontinent connected all land. This supercontinent, **Pangaea**, existed over 200 million years ago. Pangaea was made up of ancient deserts, tropical swamps, mountain ranges, forests, and scrub lands. A universal ocean, **Panthalassa**, surrounded the land. The memory of this past is preserved in the fossil record. Paleontologists today find identical fossils on separate continents. Pangaea and Panthalassa are Greek words meaning "all land" and "all sea". Other combinations of land masses and oceans existed before Pangaea and Panthalassa.

According to paleontological research and theory, primitive life began on our planet more than two billion years ago! This early life was a single-celled, microscopic bacterium in ancient seas. Earth's original atmosphere lacked the oxygen levels necessary for life to exist on land. Millions and millions of years went by as additional life forms evolved. Oxygen levels increased as the first plants developed **photosynthesis**, the ability to use the sun's energy to create food for themselves. A layer of ozone built up in the atmosphere and protected life forms from the sun's rays. Soft-bodied **invertebrate** animals began to develop in

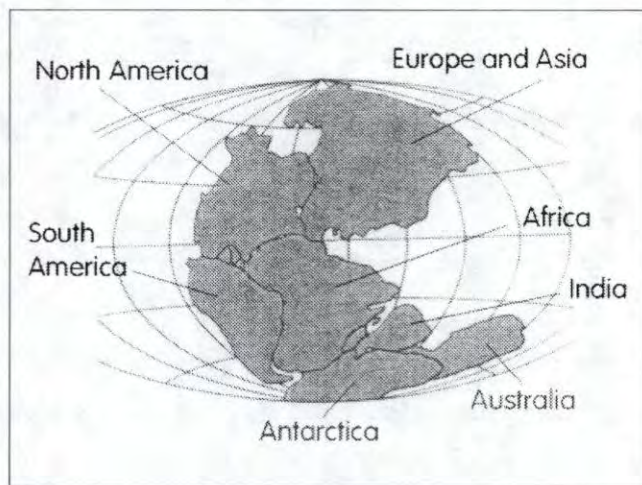
water. Millions more years went by as life continued to evolve. Animals with hard outer **exoskeletons** appeared. Marine, or ocean water, life expanded tremendously. Millions of years later, **vertebrates**, or animals with a backbone, emerged. Primitive fish were the first vertebrates. Environmental changes continued as life forms evolved.

Millions more years passed as plant life advanced from water to land. The oxygen in the atmosphere increased and created a more suitable environment for land life. Dense vegetation on land developed, followed by the first **amphibians**, animals able to subsist both in water and on land. Temperatures warmed, and the land dried. **Reptiles**—vertebrate, air-breathing animals covered with scales that crawl on short legs or their bellies—evolved. Geologists and paleontologists believe the supercontinent of Pangaea formed as reptiles emerged from the sea. This theory explains why the same fossils have been discovered on our separate continents. The most famous reptiles, known as dinosaurs, ruled for millions and millions of years. Tiny **mammals**—hairy, warm-blooded animals that feed their young with milk produced in mammary glands—competed to survive alongside the dinosaurs. The extinction of these ancient reptiles allowed mammals to continue to evolve. Millions more years passed. Then, just a mere two or three million years ago, the first humans appeared. Their existence is preserved in the fossil record.

There are many other theories about the origins of the earth and of life on earth. Scientists continually

debate the various theories that attempt to explain the very early past and our origins. Future developments, discoveries, and research may lead to new ideas. Current theories may be proven wrong. The ideas we have presented here represent those that seem most likely at the present time.

An archaeologist must be aware of other fields of study in order to conduct archaeological work. This knowledge helps the archaeologist understand the earth's evolution and learn the place of human existence within that evolution.



The coastlines of today's continents are evidence that they were once connected as a "supercontinent" known as Pangaea.

LESSON 2A—VOCABULARY: WHAT IS THE EARTH'S ANCIENT ORIGIN?

amphibian _____

astronomy _____

Big Bang _____

chronological _____

continental crust _____

continental drift _____

core _____

evolution _____

exoskeleton _____

extinct _____

fauna _____

flora _____

fossils _____

geologic time scale _____

geology _____

igneous _____

invertebrate _____

LESSON 2A—VOCABULARY: WHAT IS THE EARTH'S ANCIENT ORIGIN? (CONTINUED)

magma _____

mammal _____

mantle _____

metamorphic _____

New World _____

oceanic crust _____

Old World _____

origins _____

paleontology _____

Pangaea _____

Panthalassa _____

photosynthesis _____

plate tectonics _____

reptile _____

sedimentary _____

vertebrate _____

LESSON 2A—ARCH ACTIVITY: CONTINENT CONNECTION

Grades: 3–8

Time: 40 minutes

Content Area: science, geography, writing, and art

Who: individuals and pairs

Materials:

world maps and tracing paper

for each pair

thin cardboard

scissors

glue

large blue construction paper

Arch Journal

OBJECTIVE AND OUTCOME

- Students will understand the theory of plate tectonics and the earth's movement.
- Students will create a world map of the ancient supercontinent (Pangaea) and write about plate tectonics.

ACTIVITY

1. Inform students they will create Pangaea, the ancient supercontinent. Assign students to work in pairs.
2. Each pair needs a world map and tracing paper. Instruct students to trace the general outline of each continent. Then turn tracing paper over and trace over the outlines with a soft pencil. Discuss continents and their current locations.
3. Turn the tracing paper back over, place on cardboard, and draw the lines. Carefully cut out the shapes. Instruct students to fit the continents together, like a jigsaw puzzle, to form the supercontinent, Pangaea, before the continents drifted apart. Make sure the cardboard continents are facing in the right direction. Glue the assembled pieces on the blue construction paper, which represents the sea.
4. Discuss the changes in the loca-

tions of the continents through time. Locate a map of continental drift locations and create overheads to show students. Instruct students to write a paragraph in their Arch Journal describing those changes.

EXTENSIONS

3–8:

- Research vocabulary.

See: Lesson 2A—Vocabulary

- Create possible supercontinents of the future.

LESSON 2A—ARCH ACTIVITY: WHEELING THROUGH TIME

Grades: 3–8

Time: 30 minutes

Content Area: science and writing

Who: individual

Materials:

blank time wheel (one for each student)

completed time wheel (one for each student)

colored pencils

Arch Journals

OBJECTIVE AND OUTCOME

- Students will gain an understanding of time past since the earth's beginnings.
- Students will create personal time wheels for the geologic eras, compare theirs with the geologic time wheel, and write sentences about the differences and similarities they discover.

ACTIVITY

1. Discuss the geologic past in terms of eras. These eras are named the Precambrian, Paleozoic, Mesozoic, and Cenozoic. List these on the board without reference to time.

2. Hand out a blank time wheel to each student. Instruct each to divide his or her wheel into pie-like sections indicating the length of each era. Use 12 o'clock for the beginning. Instruct students to color and label each section with the name and amount of time they believe is represented. Hint to them to use millions and billions of years.

3. Have students share their wheels and interpretation of time. Determine which eras they believe are the longest and the shortest.

4. Hand out geologic time wheels

with the correct time periods.*

Compare the students' ideas with those of geologists. Discuss how much of what we are familiar with (including dinosaurs) is very recent in geologic time. Have the students write these comparisons in their Arch Journals.

EXTENSIONS

3–5:

- Research vocabulary.

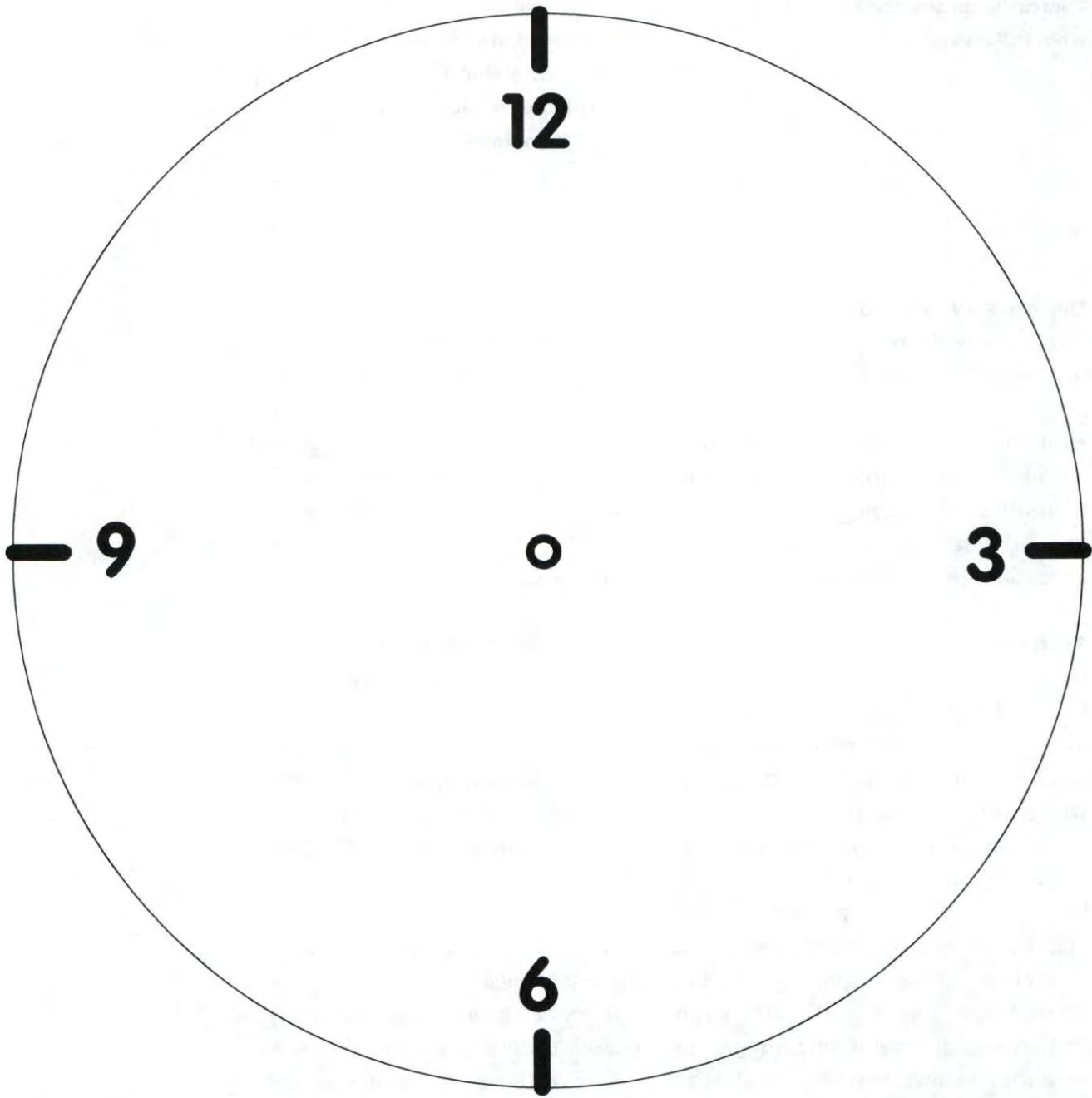
See Lesson 2A—Vocabulary

3–8:

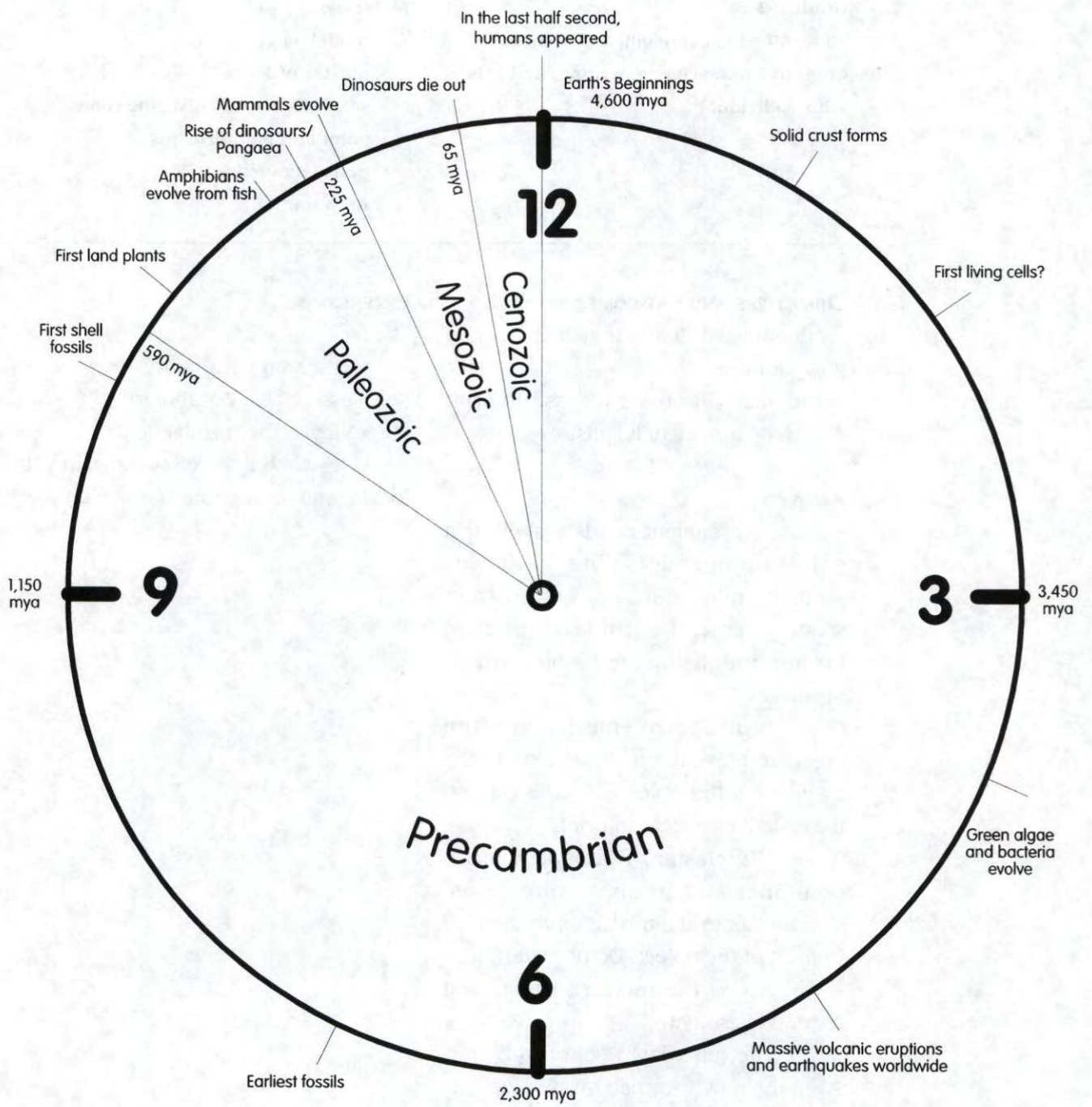
- Locate and study other geologic time scales. Write reports on periods and epochs in an era. Research life in each.

* *Precambrian—Age of Invertebrates (4.6 billion–590 million years ago); Paleozoic—Age of Fish and Amphibians (590 million–225 million years ago); Mesozoic—Age of Dinosaurs (225 million–65 million years ago); and Cenozoic—Age of Mammals (65 million years ago–present).*

LESSON 2A—ARCH ACTIVITY: WHEELING THROUGH TIME



LESSON 2A—ARCH ACTIVITY: WHEELING THROUGH TIME



mya = million years ago

LESSON 2A—ARCH ACTIVITY: FOSSIL IMPRINTS

Grades: 3–8

Time: 40 min., overnight, and 40 min.

Content Area: science, writing, and arts

Who: individual

Materials:

modeling clay

plaster of Paris

seashells and/or solid pine cones

paint and paintbrushes

petroleum jelly

Arch Journal

OBJECTIVES AND OUTCOMES

- Students will learn that a fossil is a past lifeform.
- Students will create a fossil imprint and write a story of its past.

ACTIVITY

1. Each student needs a shell or a solid (unopened) pine cone, or students may share objects. Instruct students to roll out a layer of clay, large enough for their object to fit onto.

2. Brush petroleum jelly on the object to prevent it from sticking to the clay. Press the object into the clay so that it leaves a clear imprint.

3. Mix plaster of Paris in a clean container, according to directions. Carefully pour the mixture into the clay imprint of the object. Do not overfill.

4. Allow the mixture to set and harden overnight.

5. The next day, peel off the clay. Paint the newly formed fossil.

6. Assign students to write a paragraph describing the object's journey as it became a fossil. Assign particulars if needed: geologic era, sediments, location, etc.

EXTENSIONS

3–8:

- Research vocabulary.

See: Lesson 2A—Vocabulary

- View a fossil collection.

• Research fossil discoveries in your locale, and throughout the world.

LESSON 2B—NARRATIVE: WHAT WERE THE ENVIRONMENTAL CONDITIONS OF THE HUMAN PAST?

Archaeologists believe modern human origins and the later arrival of people in North America took place during the Ice Ages. Think about the coldest and snowiest day you remember. Imagine having no house, but instead a cave or a shelter of branches and hides in which to live. You cannot visit a grocery store to buy food. You must depend on dried plants that you harvested during a warmer time of year. You also eat meat preserved from the animals you have hunted. You hope that you have enough to last through the entire cold season. No thermostat turns up the heat in your home. Instead, you build a fire for warmth and protection from the natural elements. Surviving the cold and winter storms can be difficult, but you manage to survive. This was the way of life for Montana's first inhabitants.

By studying past living conditions, archaeologists find clues that help them reconstruct past lifeways. Archaeologists study Ice Age environmental conditions to gain knowledge of the lifeways of the earliest humans. The Ice Ages began about a million and a half years ago. Current geological research, conducted through study of sea floor sediments, indicates that there have been a series of at least seventeen major **glacials**. Each glacial, a period of increased cold and ice formation, was followed by an **interglacial**, or warming trend. Each Ice Age glacial and interglacial cycle

The human past included Ice Age environmental conditions.

lasted for approximately 100,000 years, with the glacial period typically lasting longer than the interglacial. The most recent glacial period ended about 10,000 years ago. Some geologists believe the Ice Ages have ended. Others believe we are currently experiencing an interglacial.

The Ice Ages are known as the **Pleistocene Epoch** on the geologic time scale. Our present time, which began about ten thousand years ago, is called the **Holocene Epoch**, or recent time. During the Holocene Epoch, our climate has fluctuated but remained much the same. Both the Pleistocene and Holocene epochs belong to the **Quaternary Period** in geological time. The locations of the continents in present times are relatively close to the locations they had during the Ice Ages, but the extent of ice and the levels of the seas have fluctuated greatly.

A glacial period began with an increase in precipitation as snowfall. During glacials, Ice Age temperatures dropped an average of seven to ten degrees below current trends. Over hundreds of years, this weather pattern created ice sheets, or **glaciers**, in high mountains and across much of the land in northern latitudes. Glaciers grew and spread as colder weather continued for more hundreds of years. The huge ice sheets originated in northern regions and moved southward. Most of northern Europe, Asia, and North America was covered with glaciers. At the same time, the oceans became shallower as the earth's

waters froze. The glacial Ice Age climate in Montana was similar to that of modern day Alaska, complete with **tundra** and **taiga**. Tundra is an arctic, treeless plain, and taiga is a subarctic forest of conifers.

The Ice Age is of great interest to many different scientists because it was the latest major change in the earth's climate. Ice Age geology and environmental conditions are easier to study and decipher because the evidence is much newer than the changes that occurred further back in Earth's time. Understanding past environmental changes helps us prepare for future challenges of a similar nature. The glacial areas that still exist on Earth can be found only in a few high latitudes and high altitudes. Greenland and Antarctica are year-round examples of glacial environments. The Arctic Ocean is permanently frozen, just as the northern Ice Age waters were. The Himalayas, Alps, Rockies, and Southern Andes Mountains all contain mountain glaciers today. Glacier National Park in Montana is an excellent example of an Ice Age climate. Scientists study and research environmental conditions in these places to learn about the past.

The most recent glacial in North America was the **Wisconsinan Glaciation**. It began about 100,000 years ago. Two giant ice sheets were present on our continent. The **Laurentide** glaciers spread over northeastern Canada and the United States, all the way from the Atlantic coast west to Alberta, Canada. In Montana they extended as far south as the current course of the Missouri River. At the same time, the

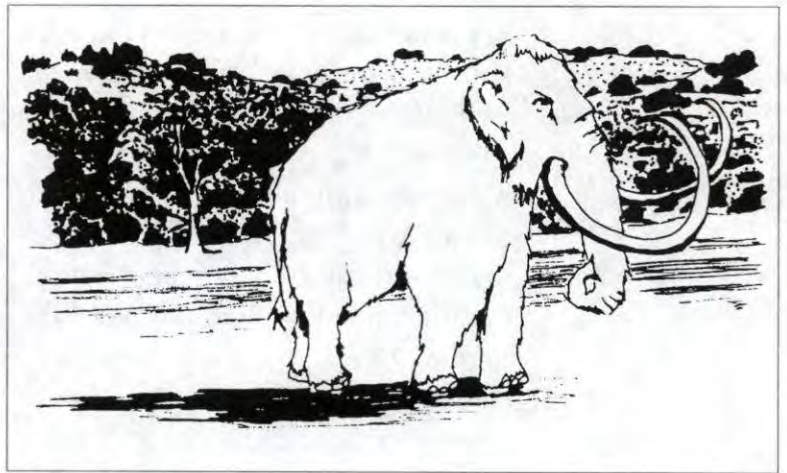
Cordilleran glaciers covered the northern Rocky Mountains west to the Pacific Ocean. In some places, these glaciers could be one mile high. That is higher than any structure ever built by man. The surrounding ice fields may have been two miles high. The ice sheets covering northern North American mountains looked like giant, white rivers of ice.

The weight of glacial ice pushed downward. Water melting between the ice and bedrock made an excellent surface for movement. Everything that was in the path of a glacier became surrounded by ice. Large rocks carried within a glacier scraped and grooved the surface of the land. When a glacier moves, it is like a bulldozer. It forces everything in front of it upward and out to the edges of the ice sheet. Glaciers sculpted the landscape and created new terrain over many thousands of years.

Interglacials could last as long as a glacial, up to 100,000 years, but they generally tended to be shorter-lived. As an interglacial began, temperatures rose a few degrees, and the ice sheets began to melt, or retreat. Rock and soil, formerly trapped in the ice and carried a considerable distance from their point of origin, were left behind on Montana's landscape as large boulders and entire ridges. As the melting proceeded, the glaciers became like icebergs on land. Ice dams and melting water created large lakes. One piece of evidence that a glacier has passed is basement rock that has been scoured or polished. Melt water left gravels and sand far beyond the front of the receding ice. "Potholes" and the rolling topography of the Hi-Line in Montana are glacial remains.

The most recent Ice Age deposited the thick, rich soils of our plains states. With alternating cold and warming trends, a great variety of edible plants were available at any given time in most of Montana. These food sources provided nourishment for a long list of animals. Both flora and fauna migrated with the changing seasons and climate. Animals followed the vegetation changes. If an animal depended on a certain plant to live, and that plant became extinct, the animal did not survive.

Most of the animal fossil remains in the Western Hemisphere are from the Pleistocene Epoch. **Megafauna**, animals weighing more than one hundred pounds, prevailed during the Ice Ages. Species of saber-toothed tigers, bear-sized beaver, and large ancient bison roamed the Ice Age plains. Ancestral camels and horses also lived in Montana during some periods. Megafauna included teratorns, a vulture-like bird with a wingspan of fifteen feet! Lions of the past were much larger than those of today. And the antlers of ancient moose measured eight feet across. Much of the Pleistocene megafauna became extinct at the end of the last glaciation, around 12,000 to 10,000 years ago. Changes in environmental conditions may have caused their disappearance. Some believe that early hunters, arriving in North America at the end of the last Ice Age, may have been overzealous in hunting these animals. Other scientists speculate that other factors—a drought or flood, competition with other animals, epidemics and parasites, or a meteorite catastrophe—may have caused the extinction of the megafauna.



More than likely, a combination of some of these events occurred.

The most famous of the Ice Age megafauna are the **woolly mammoths** whose remains are found in locations all over the world. A fully grown woolly mammoth weighed as much as 16,000 pounds and stood fourteen feet tall at the shoulder! The flesh of a woolly mammoth could feed a family for one year, as long as the meat did not spoil. The woolly mammoth originated in North America and migrated elsewhere. The **mastodon**, another elephant-like animal that people often confuse with a mammoth, migrated to our continent from Asia. Both were hunted by the earliest ancient people in North America. Woolly mammoths were also illustrated by ancient artists in Old World cave paintings.

When scientists study past environmental conditions, they search for clues that might help us with our current problems. Many animals of 10,000 years ago are closely related to those of today. The extinction during the Pleistocene Epoch is the first major extinction with humans on the scene. More than one hundred species of plants and animals became extinct 6,000 to 10,000 years ago. By understanding patterns of

The mammoth was one of many large mammals that disappeared from Montana at the end of the last Ice Age, about ten thousand to twelve thousand years ago. Some archaeologists believe that hunting by Paleoindians contributed to the mammoth's extinction. *Courtesy Lolo National Forest*

human involvement, we may acquire knowledge regarding the evolution and extinction of future species. New species of plants and animals develop along ocean floors and deep in rain forests. While the extinction of species is a natural occurrence, human encroachment on habitats, and the hunting of endangered animals, may cause premature extinction.

Human progress impacts our

earth. Studies of global warming indicate major changes in the environment. Some alterations result naturally, while others are the product of human activities. Understanding the effect humans have had on the earth through time, as well as understanding the effect the environment and climate have had on humans, may offer us valuable guidance for future changes and challenges.

**LESSON 2B—VOCABULARY: WHAT WERE THE ENVIRONMENTAL
CONDITIONS OF THE HUMAN PAST?**

Cordilleran _____

glacial _____

glacier _____

interglacial _____

Holocene Epoch _____

Laurentide _____

mastodon _____

megafauna _____

Pleistocene Epoch _____

Quaternary Period _____

taiga _____

tundra _____

Wisconsinan Glaciation _____

woolly mammoth _____

LESSON 2B—ARCH ACTIVITY: GLACIAL GUTTERS

Grades: 3–8

Time: 40 minutes and overnight

Content Area: science, and writing

Who: whole group and individual

Materials:

two metal bread pans

gravel and rough stones

piece of wood, about 8" x 20"

cardboard box

water

freezer

Arch Journal

OBJECTIVES AND OUTCOME

- Students will see glacial action in two forms, smooth and rough.
- Students will create two glaciers, observe their movement, and write sentence comparisons.

ACTIVITY

1. Fill metal pans halfway with cold water. Add gravel and rough stones to one, covering the bottom. Make sure the other is filled with water to the same level.

2. Freeze overnight. Make sure they are level in freezer.

3. The next day, remove from freezer and let sit for 15 minutes. Remove ice from the pans.

4. Lean the piece of wood against the box to act as a mountain slope.

5. Test both glaciers to observe movement. Instruct students to write sentences comparing the movement of the smooth glacier to that of the rough glacier. (Students should find the smooth glacier moves more readily than the rough due to friction created by the stones and gravel.)

EXTENSIONS

3–8:

- Research vocabulary.

See: Lesson 2B—Vocabulary

- Research ice ages and glaciation.

- Identify and discuss the following terms: cirque, glaciated valleys, erratics, drumlins, eskers, moraine, hanging valleys, crevasses, tarns.

- Research glaciers in the world today (Glacier National Park, Banff-Jasper Parks).

- Research glacial Lake Missoula.

LESSON 2B—ARCH ACTIVITY: RISING WATERS

Grades 3–8

Time: 20 minutes or longer

Content Area: science and writing

Who: whole group

Materials:

large clear bowl

two trays of ice cubes

ruler

Arch Journal

OBJECTIVE AND OUTCOME

- Students will gain knowledge of the fluctuating ocean water levels during the Ice Ages.
- Students will observe and write about the changes that occur as ice is added to water.

ACTIVITY

1. Fill bowl half-way with hot water. Measure water height. Add two trays of ice cubes.

2. Wait for the ice to melt, and measure the water height again. (Note: It may take the ice some time to melt, and the students may need to revisit the bowl later in the day to measure).

3. Compare the change in water level in the bowl, as the ice melts, to that during the Ice Ages as water that was landlocked in glaciers melted. Instruct students to write a paragraph about the changes in the coastline of a continent as the water levels varied during an Ice Age.

EXTENSIONS

3–8:

- Research vocabulary.

See: Lesson 2B—Vocabulary

- Research the volume of water currently frozen in glaciers and ice.
- Research global warming and the effect it may have on our world.

LESSON 2C—NARRATIVE 1: HOW DID HUMANS ARRIVE IN NORTH AMERICA?

Think about your family's move to Montana. Someone in your family moved here from another part of our country, or even another part of our world. The move, or **migration**, may have happened recently, or it may have taken place years ago. If your family's journey happened in the last few decades, they more than likely traveled to Montana by motorized vehicle. If the migration took place earlier, your ancestors may have traveled to Montana by train, by covered wagon, or even on foot. All of the families of the people who live in the land we call Montana **immigrated** here—traveled here from another area—at some time in the past.

Montana's historical archaeologists are interested in the lifeways of people who migrated to our state during the eighteenth and nineteenth centuries. Many written records exist that help us study the historical past. Meriwether Lewis and William Clark kept detailed journals when they explored this land in the early nineteenth century. Other early explorers have left us **primary documents**, or first-hand written accounts, of their travels. Historic immigrants explored the land, trapped animals for fur, traded with the American Indians who were already here, and mined for precious minerals. Others who moved to Montana ranched, homesteaded, and worked industrial jobs. You, too, are a part of Montana's continuing history.

The prehistoric **era**, or time, intrigues many archaeologists. The

Archaeologists believe humans originated in the Old World and migrated to the New World.

artifacts of ancient people provide clues that help us study those who moved to and lived here long before European immigrants arrived. Discoveries of artifacts crafted by humans guide archaeologists to develop theories about the ancient lifeways in Montana. By studying artifacts and other evidence, archaeologists can reconstruct the dates of arrival, travel routes, and daily life of the prehistoric people who lived here. The majority of archaeologists believe that the first people arrived in Montana at least 12,000 years ago. Other archaeologists believe the people arrived thousands of years earlier. And some Native Americans believe that their ancestors were created here and have always lived in this land. Future research and fieldwork may change our ideas about this question.

Anthropology is the science that studies the origin, development, and culture of people. Some anthropologists study human skeletons to determine our physical origins and the changes in ancient people. Other anthropologists study social customs and beliefs. On the basis of their studies, anthropologists have concluded that humans have adapted, or changed, through time. According to this view, humans have evolved, just as plants and animals have. This theory is challenged by people outside the scientific community who have other beliefs about the origins of humans.

According to current scientific

research, the earliest people lived in Africa, or possibly Asia, over two million years ago. As environmental conditions shifted, people adapted to the changes. Their ability to walk in an upright position, and the use of early stone tools, helped them survive the challenges of daily life. The human ability to think and plan ahead also made it possible for them to survive. As time progressed, the tools humans made of stone became more refined and sophisticated. The human ability to use fire for protection and cooking represented yet another advancement. Anthropologists believe that human intelligence—which allows people to subsist through dangers and difficulties—separates humans from other species of mammals.

Anthropologists have developed a timeline that represents the changes and adaptations that have occurred in human development. The most recent human expansion came around 200,000 years ago when contemporary, or modern, humans evolved. This species, our species, is known as **Homo sapiens**. Homo and sapiens are Latin words meaning “man” and “wise.” Discoveries in Europe, Asia, and Africa currently suggest that Homo Sapiens evolved in the Old World and later migrated to the New World.

You may have heard of the ancient times referred to as the **Stone Age**. People made tools out of stone during this period. Metal tools were not invented yet. The terms **Paleolithic**, **Mesolithic**, and **Neolithic** describe the old, middle, and new stone ages as they occurred in the Old World. Lithic (from the Greek word *lithos*) means

“stone.” The Paleolithic covers the greatest number of years, stretching from approximately two million years ago to about ten thousand years ago. Few technological changes took place during the old stone age. The Mesolithic and Neolithic were of shorter duration, and advancements in technology progressed more rapidly. These periods came after the last Ice Age. Each age’s length varied, depending upon the location of a culture in the world. Old Stone Age people were intelligent **hunters and gatherers**. They followed animal herds to obtain food, and they migrated with the seasons to harvest plants. Mesolithic people were also hunters and gatherers, although they also fished in many places. There are very few people living as hunters and gatherers in the world today. Farming developed during the Neolithic, or New Stone, Age.

The Stone Age came to an end when metal tools and ornamentation became widely used. Old World cultures were most affected by this development. The **Bronze Age** followed the Stone Age because bronze tools and weapons were sturdier than those made of stone. The Iron Age began as people learned to combine metals to make iron, which was even sturdier than bronze. Europeans brought iron tools and weapons to the New World. Before they had contact with Europeans, American Indians used tools made primarily of stone. In Montana, stone tools were used through the 1800s. However, once contact was established with the eastern United States, American Indians placed a high value

on metal tools and equipment and used them regularly.

Through the hundreds of thousands of years of Stone Age living, ancient humans migrated to most areas of the world. All over the world, cultures rose, developed, and disappeared over time. Those people who were able to adapt survived. Humans had to adapt to changes during the Ice Age in their natural and social environments. The ancient cultures that were unable to make the necessary modifications did not last.

Cultures in various parts of the world developed at different rates and in different directions. The abilities to grow crops and domesticate animals—as sources of food—and to manufacture tools out of metal indicated that a culture was developing economically. With the passing of the Stone Age, most people became less nomadic and they settled permanently in villages. A society became a civilization when it developed social beliefs, class position, and rank and its people settled in cities. Industry and trade with other cultures signified further growth within a civilization. Wars with opposing societies often altered civilizations. Cultures continue to develop and change today.

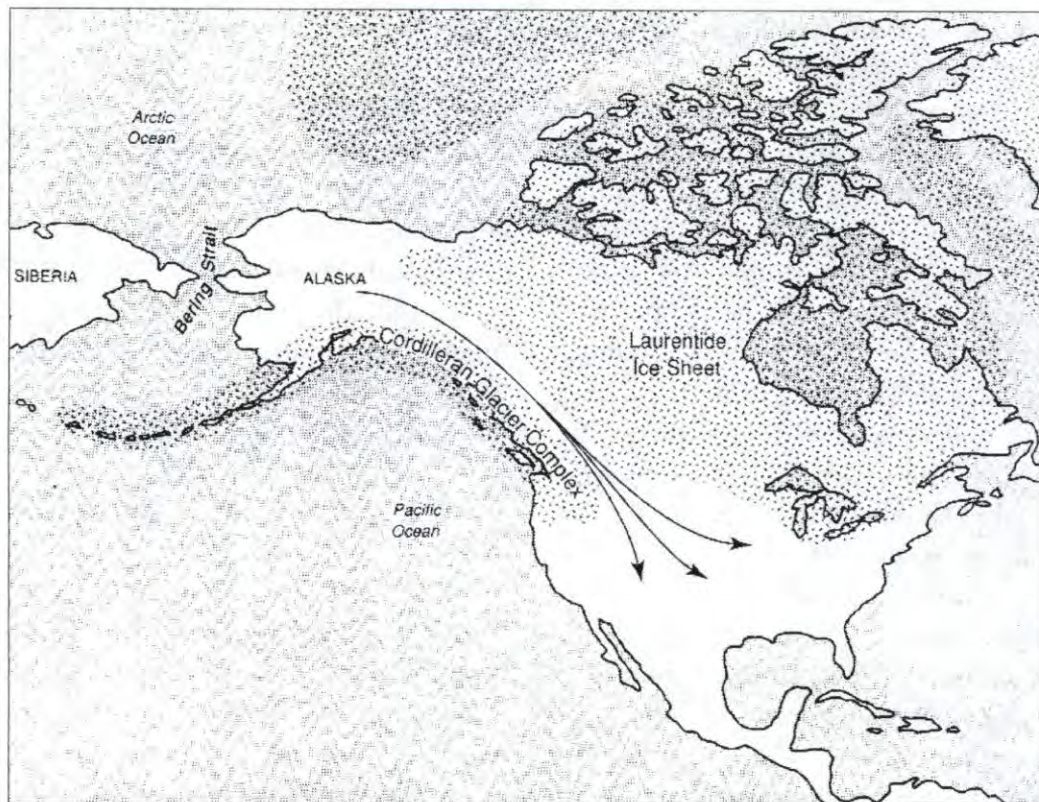
Archaeologists study archaeological sites to develop theories about the ancient travel routes to North America. Many archaeologists believe that the first humans migrated from northeastern Asia to the New World during the last Ice Age, when ocean levels were lower. Over the years, people then migrated all the way to the tip of South America. An opposing theory states that people arrived first in South

America and then walked north. Yet another theory argues that the first people here came along the coasts of Greenland and Iceland. Ocean currents, according to this theory, offered highways to the New World in any season. An alternative boat theory states that the first people in North America arrived from Australia and the Pacific Islands. Future archaeological discoveries and methods may lead to new interpretations of arrival or, or more likely, prove a theory that already exists.

For many archaeologists, the **Bering Land Bridge** theory has merit. It states that ancient people walked from **Siberia**, in northeastern Asia, to what is now Alaska. This would have been possible thousands of years ago during the **Ice Ages**. The geological record shows that, during periods of cold and increased snowfall, much of the earth's water was captured in huge ice sheets and glaciers. As the water froze on land, sea levels dropped dramatically, exposing a wide strip of land connecting Asia and North America. Called **Beringia**, this land bridge would disappear as water rose during warmer periods.

Geologists believe that Beringia was exposed for travel at different times, around 38,000 BC, 26,000 BC, and 11,000 BC. These intervals would have allowed animals and humans to migrate from one continent to another, in either direction. Animal fossils provide the proof of a migratory route between the two continents. Ancient camels and horses originated on our continent and migrated to Asia, leaving only fossils in North America. Ancient animals that migrated east

During the last Ice Age, there was a land bridge across the Bering Strait, between Siberia and Alaska. Archaeologists believe that some of the first humans came to North America across this land bridge and then passed down through an ice-free corridor between the glacial ice sheets. Recent evidence suggests that other routes into North America also existed. *Courtesy Montana Historical Society.*



from Asia included fox, wolf, bison, deer, bear, yak, and elephant. Traffic was definitely two-way on the Bering Land Bridge.

Beringia is submerged today, with North America and Asia separated by only fifty-six miles of shallow ocean. During the Ice Ages, Beringia was an immense stretch of land, stretching hundreds of miles wide north to south. Ancient people may not have even been aware that they were migrating to a new continent. More than likely, they were traveling in search of food as the seasons changed. They were probably following herds of animals grazing across the land. Other food sources, such as plants, also encouraged people to migrate. And weather conditions may have forced people eastward as ice sheets moved into Siberia. There may also have been too many people for the land to sustain. A

combination of these circumstances most likely led to the migration across the land bridge.

Ancient people living in the northern latitudes were well adapted to a climate of cold and ice. Few trees grew on Beringia. It was an immense grassland. The peoples' shelters were huts made of branches or bones and animal skins. They carried their belongings as they migrated. They traveled in small bands, or family groups, and subsisted as hunters and gatherers. They caught fish in lakes and along the seashores. They may have traveled along the shorelines in small boats made of animal skins. They probably traveled most during the warmer seasons, but sometimes they even traveled when the land was covered with winter's snow and ice.

This migration route across the Bering Land Bridge existed only during

the coldest part of the glacial periods. During most of the glacial period and especially during interglacials, the ice melted and Beringia was again covered by the sea. The pathway from the continent of origin was closed, and the people and land mammals who had crossed the bridge from Asia became North American residents.

Once on this continent, the people are believed to have eventually traveled south, but archaeologists are not sure which way they went. At that time, large parts of Alaska were relatively free of glaciation, but huge ice sheets covered much of Canada and the northern United States, blocking the way to the south. Most archaeologists believe that seasonal warming periods melted the edges of the glaciers and created ice-free **corridors**, or paths, allowing the people to migrate between the mountains and the plains. The routes varied, depending on each season's weather; but the people probably used high plateaus extensively, negotiating their way on foot through mountain passes.

Another route to the south may have hugged the shoreline of the Pacific Coast. During the glacial periods, when ocean levels were lower, the beaches and coastal plain were much wider than are those today. Unfortunately, if early people did travel along this glacial shoreline, their campsites are today under the ocean and difficult for archaeologists to find and study, if they are preserved at all.

Families may have lived in the cold north country for long periods of time, or they may have hurried south as quickly as possible. The distance from the land bridge to the tip of South

America is 11,000 miles. In studying artifacts and sites in South America, archaeologists have determined that some of these are very old—and possibly even older than those in North America! Further study of South American sites will provide additional clues to the original migration into the New World and about early life in North America.

Archaeologists study remnants of ancient trails through Montana for clues to the past movements of people. The **Old North Trail** is one such trail. Some believe this trail, or system of trails, may have been used as long as 10,000 years ago, when Montana's early travelers walked through the ice-free corridor. The path follows the eastern edge of the Rocky Mountains, or the **Rocky Mountain Front**. At the front, the Great Plains extended eastward and mountains bordered the west. Along the Old North Trail, early peoples could find shelter, wood, water, and plant and animal food sources. Historians and prehistorians have studied remnants of ancient trails along the Rocky Mountain Front that wind across streams and through gullies and traverse ridges or go around buttes. These scientists have found hunting drive lines and tipi rings near and along these trails. Ruts still preserved in the dirt may indicate that some early travelers used a **travois**, a framework of poles used to carry belongings behind dogs or horses. Rock **cairns**, or stones intentionally stacked as landmarks and symbols, occur along the route.

The Old North Trail could be the oldest and longest on our continent. A variety of other main trails probably

existed, as did smaller secondary and tertiary trails. These ancient routes connected North America long ago, much as highways do today. Families, individuals, and groups of people traveled the trails for a variety of purposes: to visit relatives, war with enemy tribes, and embark on sacred missions. Other travelers transported trade goods between different areas of the country, carrying Yellowstone's obsidian to the Ohio River, for example.

No matter which origin and travel theory proves most true, the fact is that North America (as well as Central and South America) was already inhabited by large numbers of people when

European explorers and immigrants arrived. At least six hundred separate tribes of people lived in North America at that time. They prevailed in a variety of climates and conditions, from deserts to woodlands and from plains to the arctic. These peoples exhibited great diversity in their physical appearances and lifeways. Each tribe had its own traditions, tools, houses, and languages. Even today, the different tribes have their own stories of creation and accounts of where they come from. These different tribes of "Indians" (mistakenly labeled as such by an early explorer who thought he had reached India) represent the first inhabitants of Montana.

LESSON 2C—NARRATIVE 2: FIRST PEOPLE—NATIVE AMERICAN ORAL TRADITIONS AND ARCHAEOLOGY

The following texts are by Native Americans. The first is by Roger Echo-Hawk, a Native American, about archaeological and native oral traditions regarding the first people in the New World. The second is a Kootenai creation story.

ANCIENT WORLDS

by Roger Echo-Hawk

The first people dwelt in a land of lingering darkness. In some Native American origin stories, humans emerged from this region to witness the sun's creation or the ordering of night and day. Thousands of years later, many Indians said that their ancestors entered the world from a dark place located underground. Other oral traditions, however—told in both Asia and America—describe the creation of earth from a watery world, and these stories do not typically associate darkness with the first people.

Many archaeologists believe that humans from Asia entered North America more than 11,000 years ago. As Ice Age glaciers absorbed water, sea levels fell hundreds of feet and "Beringia" appeared in the far north, linking Asia to Alaska. Some of the oldest human sites in eastern Beringia can be found above the Arctic Circle, where darkness lingers over the earth. Other scholars believe that humans followed the coastlines of Beringia by boat into the Americas—a route which does not pass through the Arctic Circle.

Climatologists believe that the Ice Ages were swept by windstorms of

much greater power than present-day hurricanes and tornadoes, and in one Indian tradition, the first people were created in the heavens and placed on earth by tornadoes. Other Indian stories say that the climate underwent a swift change when the animals (who reigned over the earth) caused summer to appear. Paleoclimatologists have found that a very sudden global warming event occurred 11,700 years ago at the end of the Ice Age. This date coincides with the earliest accepted archaeological evidence for the presence of humans in Alaska.

Many Native American oral traditions refer to the existence of dangerous "monsters" and giant animals in ancient times, and other stories are set in a period when animals and birds ruled the world. Paleontologists describe Ice Age America as a realm dominated by giant animals, or "megafauna." Mammoths, mastodons, and giant sloths towered over human hunters; and fearsome short-faced bears, great cats, and other creatures could have made the New World a dangerous place for unwary people.

In many Indian traditions, a great flood covered the earth in ancient times, and some stories associate this event with the end of the age of monsters. Traditions of a mighty deluge can be found in oral and written literatures from around the world. The end of the most recent Ice age, some 12,000 years ago, could have involved cataclysmic flooding. As the glaciers slowly melted, for

example, the sudden release of a massive ice sheet into the ocean would have brought worldwide flooding. The end of the Ice Age also coincides with the extinction of many species of megafauna around the world.

The first Americans made artifacts and left sites which archaeologists can study for insights into the distant past. The ancient ancestors of modern Native Americans also created verbal documents about their experiences, and successive generations of Indians heard these stories as accounts of actual, not fictional, historical events. If Native American origin traditions shed light on the lifeways of people who settled in North America during the last Ice Age, then Indian literature preserves a remarkable legacy of documents about ancient human history in the New World." (From: *Ancient Worlds*, Society for American Archaeology Bulletin, Volume 11, Number 4, 1993).

A VISIT TO THE SKY WORLD

(A Kootenai Creation Story)

Among the Old People (the animal people), Muskrat was considered to be a sneaky character. When his brother died, Muskrat wanted to marry his sister-in-law. She refused him. In his anger he shot her with an arrow that could not be identified by his people. When friends came to investigate the murder, Muskrat cleverly told them that the arrow had come from the sky.

The earth people were convinced that the Sky people had killed the woman and they were determined to go to the sky to make war on the Sky

people. The Earth People shot an arrow up into a cloud and when it stuck they shot a series of arrows, each into the notch of the arrow ahead of it, until they had formed a chain of arrows all the way down to the ground. Then the Earth People began to climb up into the sky.

Wolverine, who had wanted to go on the raid, was left behind. In his anger he jerked the chain of arrows down from the sky so that the earth people would not be able to climb down. When the arrows fell to the ground, they formed a chain of mountains to the south of Kootenay Lake.

When he reached the sky, Muskrat ran ahead of the others and constructed a large lake with many tipis around it. After the rest of the Earth People arrived, they searched the village for their enemies but were only able to find Muskrat in hiding. They killed him and returned to make their way back to the ground only to find that the arrow chain was gone. They went in search of Thunderbird who lived in the clouds. They captured him and plucked his feathers. Then they glued the feathers to their bodies and flew down to the ground. Woodpecker, his brothers and sister, and his cousin Flicker decided to stay up in the sky and explore a little. They walked until they reached the place where the Earth meets the sky. There they sat down on the shore of a large lake to rest. As they sat, a huge wave rolled up on the shore and poor Flicker was swallowed by Water Monster.

Woodpecker and his siblings ran from bay to bay and danced until the fish came to see what was happening. Woodpecker asked them to help locate Water Monster so that he could save his cousin Flicker. The fish were only too happy to help.

When they finally located Water Monster, Woodpecker tried to kick the monster but his foot only struck a glancing blow. He and his brothers chased Water Monster all the way up the Kootenay River and then back to the south along Lake Windermere. At Longwater Bay the monster dug an underwater cave and hid from the woodpeckers.

Just about then, the woodpeckers saw Old Grandfather Creator of the Kootenais crawling up from the south and naming all the places as he went. As he crawled he left scratch marks on the land and rivers flowed in the furrows left by his belly. "Quickly! Make a dam at the end of the lake to trap Water Monster," Woodpecker called to him.

Always obliging, Old Grandfather

broke off a chunk of mountain, formed it with his knees, and created a portage between the Kootenay and Columbia Rivers. Woodpecker was able to corner the Water Monster until the rest of the Earth People came to help him slay the monster. They cut him open and out flew Flicker, a little thinner and weaker but still alive.

The animals cut the monster into pieces. They threw his ribs into the river where they formed cliffs. Then the animals dug hot springs around the area and cooked the blood and body parts until they were well done. The animals threw the parts around the land to become food for the New People. (From Work House, Native American Environmental and Heritage Education Program, 1993)

LESSON 2C—VOCABULARY: HOW DID HUMANS ARRIVE IN NORTH AMERICA?

anthropology _____

Bering Land Bridge _____

Beringia _____

Bronze Age _____

cairns _____

corridor _____

era _____

Homo sapiens _____

hunters and gatherers _____

Ice Ages _____

immigrated _____

Iron Age _____

Mesolithic _____

migration _____

Neolithic _____

Old North Trail _____

Paleolithic _____

LESSON 2C—VOCABULARY: HOW DID HUMANS ARRIVE IN NORTH AMERICA? (CONTINUED)

primary documents _____

Rocky Mountain Front _____

Siberia _____

Stone Age _____

travois _____

LESSON 2C—ARCH ACTIVITY: HUMANS ON EARTH

Grades: 4–8

Time: 20 minutes

Content Area: history, math, writing, and science

Who: whole group and individual

Materials:

yardstick

Arch Journal

OBJECTIVE AND OUTCOME

- Students will learn that humans have inhabited Earth for a relatively short time, as compared to the geologic time scale.
- Students will estimate the distance on a yardstick they believe humans have inhabited earth. They will write sentences comparing that time with the geologic time scale.

ACTIVITY

1. Show the students a yardstick and explain that it represents all of geologic time. Instruct students to estimate on the yardstick the length they believe represents the time humans have lived on Earth, according to scientific theory.
2. Instruct students to write their estimations in their Arch Journals.
3. Inform the students that, according to the geologic time scale, the amount of time humans have actually inhabited Earth measures less than 1/16" on the yardstick. (Teachers: If Earth is estimated to be 4,600 million years old, then one inch equals about 127 million years. According to human paleontologists, humans are less than eight million years old, or less than 1/16".)
4. Instruct students to write sentences comparing their estimations with the actual measurement.

EXTENSIONS

3–8:

- Research the human past according to evolutionary theory.
 - Research Native American creation stories for Montana tribes.
 - Write a creation story.
 - Research the history of calendars and different cultural measures of time.
- See: Extension Resources—Exploring Time

LESSON 2D—NARRATIVE: WHO ARE MONTANA'S ANCIENT PEOPLE?

Imagine studying the Civil War in history class and then sharing your knowledge with your family later that evening. Your grandmother tells you about her great-great-uncle who fought in the Civil War. In fact, she shows you copies of letters he wrote to his parents about his experiences and wartime conditions. The more we know about our family histories—about the **generations** that came before us—the more excited we get about learning even more about times gone by. Archaeologists often get just as excited when they study ancient people.

Archaeologists study the past to learn about ancient daily life. By studying artifacts and their contexts, they develop theories and beliefs about how people lived long ago. However, they sometimes discover that direct information about many details in ancient life is difficult or impossible to find. In hopes of finding such details, archaeologists turn to historical information and oral history from Indian people to help reconstruct the distant past. They study the **traditions** of American Indians—the folkways passed down over many generations—for clues to unravel the past. **Legends** are stories—told from one generation to another and handed down for hundreds of years—that describe events and beliefs of a particular tribe. Together, legends and traditions tell of a way of life of long ago, of how a tribe's ancestors spent their time on the earth. Tribal historians record these ancient stories for future generations.

The ancient people are ancestors of Montana Indians.

Archaeologists combine their knowledge of traditions and legends with their scientific studies of artifacts to reconstruct the past.

Archaeologists believe that most of the ancient people of Montana were **hunters and gatherers**. These people did not plant crops or build permanent settlements. Hunting and gathering people traveled in small family **bands**, or groups, as they moved across their territories hunting animals and harvesting wild plants. They were very familiar with the behaviors and patterns of the wild animals and plants they used for food and knew where, when, and how to find them. People may have formed larger groups at some times of the year as they joined with others to follow a particular herd of animals. They may have banded together, too, for safety from predators or unfriendly fellow humans. Ancient people held annual gatherings to visit relatives and friends, to trade, and to marry. But most of the time they lived in small groups and moved their camps with the seasons and according to the availability of food and other resources they needed (for example, water, wood, and stone.)

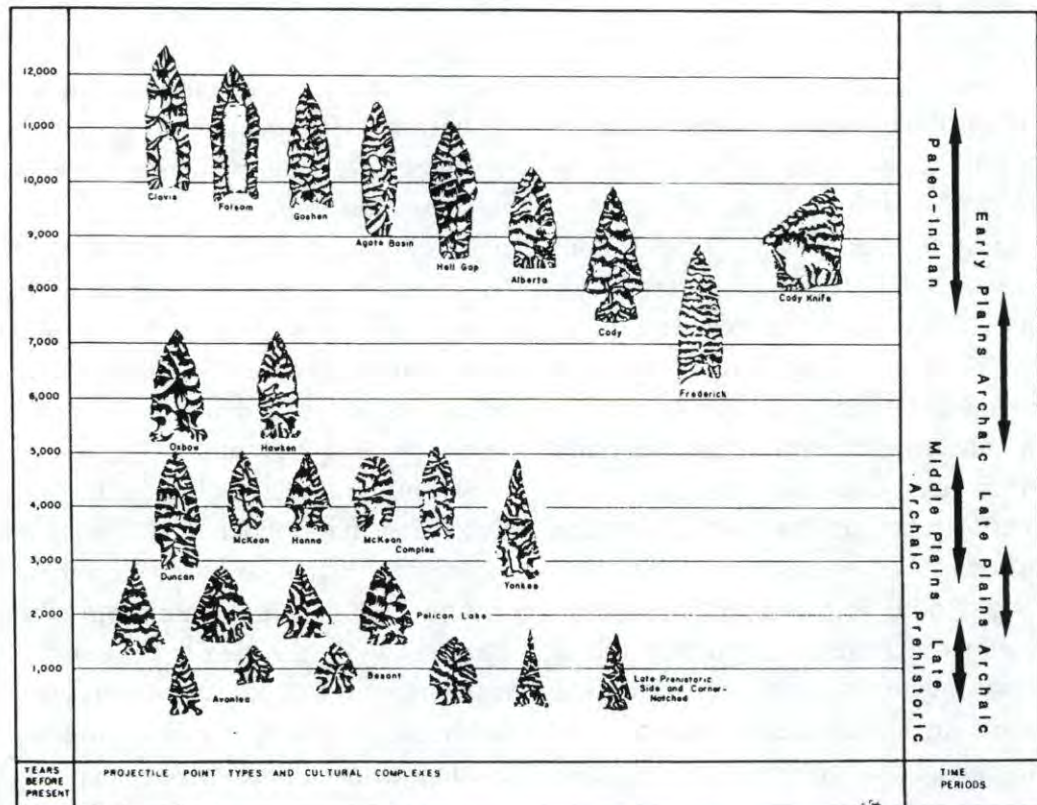
Montana's archaeological record, which goes back about 12,000 years, is quite young when compared to others in the Old World—which may be hundreds of thousands or even a million years old. When studying Montana prehistory, archaeologists divide the time of human presence into three major phases, or **periods**. Each

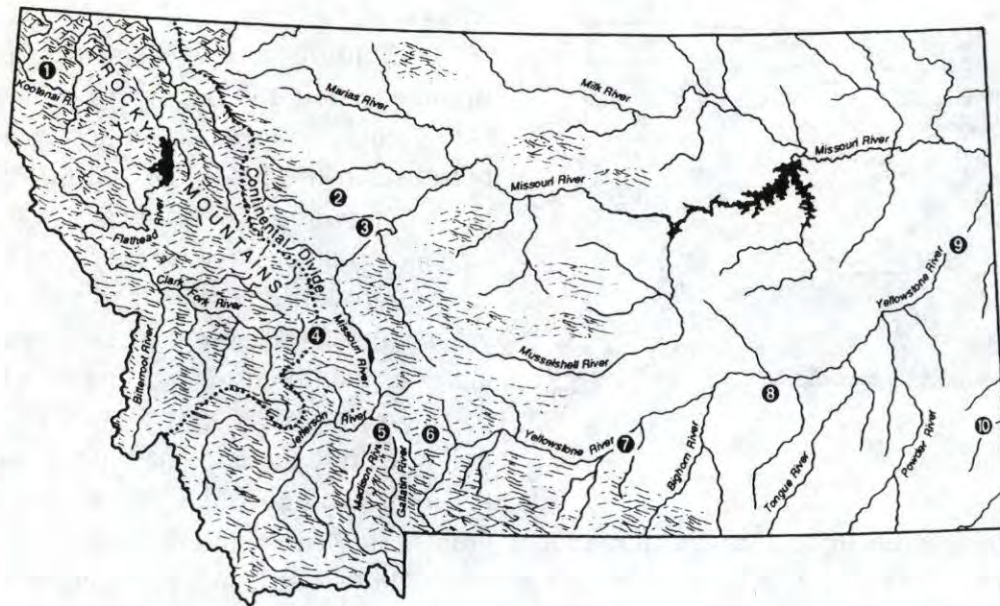
of these periods covers a distinctive time frame and is also generally distinguished by differences in **subsistence**, or the ways in which the people hunted and gathered their food. Other differences among these three periods can be found in the ways prehistoric people made their tools and weapons.

Evidence of the earliest people in Montana is found at a few sites identified as existing at around 9000 to 10,000 B.C. These sites were active at the beginning of the **Paleoindian Period**, which lasts until about 6000 B.C. This period is also sometimes referred to as the **Early Prehistoric Period**. The Paleoindian Period coincides with the end of the last glacial period of the Pleistocene Epoch and the beginning of the Holocene Epoch. Although no one knows how many,

few people are thought to have lived in Montana during this period. Most sites dating from this time are found east of the Rocky Mountains or in southwest Montana. People at this time are thought to have been very **nomadic**, moving often from place to place along the major river valleys and nearby uplands within a large territory. They moved their camps regularly during the year to find the best sources of food and needed supplies. To subsist, they hunted mammals, large and small. They probably hunted the mammoth until it became extinct in Montana sometime before 9000 B.C. after which deer, bison and smaller mammals became their primary sources of meat. They also gathered wild berries, nuts, and plants for food. A variety of animals provided the materials for their clothing. Direct evidence of Paleoindian

Montana archaeologists divide prehistory into chronological periods to help organize archaeological evidence according to time. Between periods, some things changed while others stayed the same. Projectile points are one technological characteristic that did change over time. *Courtesy GCM Services, Inc.*





A few of Montana's many important archaeological sites are marked on this map. They are as follows: (1) Pipe Creek Quarries (source of pipestone); (2) Sun River Medicine Wheel; (3) Ulm Pishkun State Park (buffalo jump); (4) MacHaffie Site (Paleoindian); (5) Madison Buffalo Jump State Park; (6) Anzick Site (Paleoindian); (7) Pictograph Cave State Park; (8) Armell's Creek Tipi Ring Site; (9) Hagen Site (earth lodges); and (10) Mill Iron Site (Paleoindian). *Courtesy Montana Historical Society.*

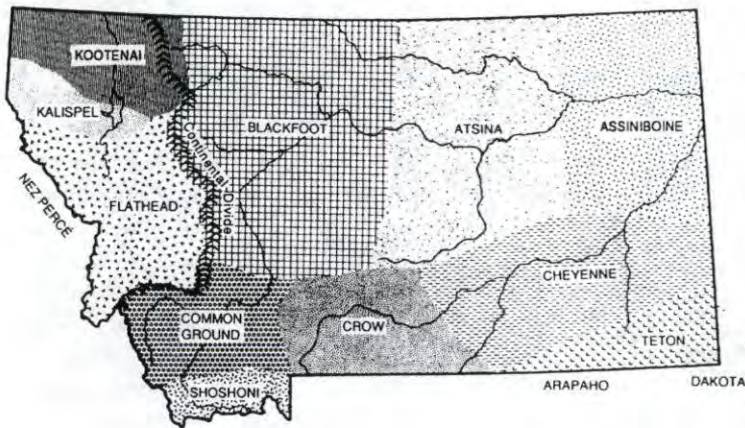
shelters has not yet been found in Montana. Based on evidence from other areas, archaeologists believe the Paleoindians lived in small dwellings with wooden pole frames covered with animal hides or wood. Occasionally, they also used caves and other natural shelters as well.

Stone, wood, and bone were the materials these early people used to make tools. The oldest known stone points are large, some measuring over six inches in length, and are thought to have been attached to hand-held wooden shafts or spears. Paleoindian points and other tools that archaeologists have found from this period show a high degree of craftsmanship and are often made of exotic or high-quality stone. The excavation of one ancient Paleoindian campsite, the Barton Gulch site near Ruby Reservoir in southwestern Montana, has provided much information about these first Montanans.

Gradual climatic changes in Montana developed as the Ice Age

ended. New flora flourished as the earth warmed and ice receded. Habitats evolved that were no longer suitable for megafauna, and several animals, including the mammoth, became extinct. Over time, Paleoindian people began to rely more heavily on a diversified diet of smaller animals and wild plants for subsistence. Later, increased numbers of grinding tools and baking hearths offer evidence that plant use increased at this time. This new period is called the **Archaic**, or sometimes the **Middle Prehistoric Period**, and it extended from about 6000 B.C. to A.D. 500.

At the beginning of the Archaic Period, some of the changes in settlement and subsistence may have been caused by a long duration of drought-like conditions, referred to as the Altithermal. This environment forced animals to seek shelter and forage in places where they could find water. Consequently, people followed the animals to these areas. Because they needed to stay near water, people



This map shows the distribution of Indian tribes in Montana at the time of Lewis and Clark, 1804-1806. Many other groups probably lived in the area of Montana during the twelve thousand years of prehistory. *Courtesy Montana Historical Society.*

probably remained in one location for longer periods and thus were less nomadic than Paleoindians. Little is known about early Archaic shelter, but archaeologists believe that small skin-covered wickiups, and later (after 3000 B.C.) tipis, were used. Also reflecting changes in Archaic lifeways were changes in technology. In addition to more plant processing tools, people in the Archaic Period made smaller projectile points. Archaeologists believe that these smaller, notched points were hafted to long darts and propelled with the help of a throwing stick, or **atlatl** (pronounced "at-LAT-l"). The atlatl allowed hunters to stalk game and kill animals from a greater distance than a spear did.

The **Late Prehistoric Period** (A.D. 500-A.D. 1800) began with the introduction of the bow and arrow in Montana. This weapon was easy to transport and accurate to use. Although bows and arrows are rarely preserved in the archaeological record, the smaller notched stone projectile points ("arrowheads") found at many Late Prehistoric sites indicate that people during this period used the **bow and arrow** as a hunting

weapon.

Coinciding with the end of the Archaic Period and beginning of the Late Prehistoric Period is an apparent increase in the bison (or "buffalo") herds. This was probably due in part to climatic conditions that were favorable for the growth of prairie and plains grasslands. Archaeological evidence indicates that the bison was important to the survival of many Montana Indian cultures, going back as far as Late Paleoindian times. In the Late Prehistoric Period, people built a way of life around seasonal bison hunting expeditions, hunting the vast herds as they roamed the plains. Horses were not available in Montana until about A.D. 1750, so Late Prehistoric people traveled on foot. They used dogs to transport gear with a **travois**, two poles lashed together for carrying household goods. Some Blackfeet elders today refer to this prehistoric time before horses as the "**Dog Days.**"

A most spectacular development during the Late Prehistoric period was the increased use of **buffalo drives and jumps**. Communal bison hunting at this time was on a scale seldom seen in the world before, or since. Late Prehistoric hunters systematically drove large numbers of bison from their grazing areas and stampeded them into traps and over jumps. The bison were then butchered and the meat dried and preserved for the winter season. Nearly every part of the buffalo was used, as implements and tools and for clothing and shelter. Montana has the highest concentration of buffalo jump sites in North America. Our plains and mountain foothills are

perfect places for stampeding buffalo off ridgetops and cliffs. The Madison Buffalo Jump and Ulm Pishkun are two places that Late Prehistoric hunters and gatherers used repeatedly as buffalo jumps.

Horses and guns had a profound effect on native lifeways. Most tribes acquired these items before they ever saw the Europeans who brought them to the New World. They obtained horses and guns from other tribes who had already begun trading with the newcomers. They quickly adapted this new technology to bison hunting and to warfare. Still, some of the old ways remained the same, including the use of the bow and arrow, tipis, and travois.

Although archaeologists know that some of the prehistoric groups are the ancestors of the tribes now living in Montana, it is not yet possible to identify specific Indian tribes of Montana during prehistoric times. This is because most of the artifacts that have been preserved (projectile points, tipi rings, hearths, etc.) were commonly used by different tribes. The archaeological record does not contain clear evidence of the languages, beliefs, and social customs that often distinguish one tribe from another. We do know that the Flathead, Pend d'Oreille, Kootenai, and Blackfeet were living in Montana before the historic period. Other tribes—the

Kiowa, Apache, and Navajo—may have lived in our area before migrating to the south. Some tribes moved into Montana as Euro-Americans settled the eastern United States and began pushing these Indians westward. These included the Crow, Sioux, Cheyenne, Gros Ventre, Chippewa, and Assiniboine. The Shoshone—who are a Great Basin tribe—are thought to have once expanded up along the Rocky Mountain Front as far north as Canada before being pushed back south by the Blackfeet.

As Euro-Americans explored and settled Montana during the 1800s, Indians were forced to change their lifestyles. The newcomers killed large numbers of bison, reducing the size of the herds dramatically. Settlers farmed and ranched land formerly roamed by the nomadic tribes. Cities and towns developed as the railways came through. The hunting and gathering way of life for Montana's Indians, which had existed for almost 12,000 years, came to an end.

Montana's tribes today work to preserve their past. Pow-wows provide glimpses of ancient ceremonies and long-standing traditions. Many tribes record their oral histories, stories, and languages for future generations. And many archaeologists work with Montana's Indians to help understand and preserve the past.

LESSON 2D—VOCABULARY: WHO ARE MONTANA'S ANCIENT PEOPLE?

Archaic/Middle Prehistoric Period _____

atlatl _____

bands _____

bow and arrow _____

buffalo drives and jumps _____

“Dog Days” _____

generations _____

hunters and gatherers _____

Late Prehistoric Period _____

legends _____

nomadic _____

Paleoindian/Early Prehistoric Period _____

periods _____

subsistence _____

traditions _____

travois _____

LESSON 2D—ARCH ACTIVITY: BUFFALO JUMP (USING THE LAND AS A TOOL)

Grades: 4-8

Time: two to three 45-minute sessions

Content Area: language arts, expressive arts, geography (land forms)

Who: whole class and small groups

* **Note:** Ulm Pishkun Buffalo Jump trunk is available from Cascade County Historical Society, in Great Falls at (406) 452-3462.

Materials:*

clay

sticks and branches

stones, rocks

cardboard box lids, 11 x 16"

Presentation Materials:

paper and pencils for lists,

butcher paper or newsprint,

markers, etc.

OBJECTIVE AND OUTCOME:

- Students will gain understanding of what a buffalo jump is, and what makes a good buffalo jump.

- Students will draw or make a clay model of a jump site and discuss its uses and characteristics.

- Students will synthesize their knowledge of buffalo jumps by developing a short presentation advertising their site.

- Students will be able to go to a buffalo jump site and understand what they are seeing and how jump sites were used.

ACTIVITY:

Have students read or listen to the attached story: "When Bison and the People Lived Together."

Part I: Making a Buffalo Jump

1. After reading or listening to the story, the class talks briefly about what factors make a good buffalo jump site (cliff/slope arrangement, direction, approach, grasses, wind, buffalo nearby, water, etc.)

2. Break up into small groups. Each group will create a buffalo jump out of clay (or, using trowels and gardening

tools, they may make one out of dirt and rocks in the schoolyard). Use sticks and rocks to indicate the natural environment of the jump site. Each buffalo jump should include approach, a gentle rise before the cliffs, dropoff, slope, processing area, and campsite.

3. Silent walkabout: The class silently walks around to view and privately evaluate each model buffalo jump, thinking about good ideas they see to incorporate into their own model. Students may return to their own model to adjust or improve it.

4. As a class, discuss each model. How do bison get to the cliffs? What grasses are there? Where are the people camped? How close is water? At this point, the teacher can provide more detailed information about buffalo jumps:

- Tipi rings often help identify where people camped at different times.

- Different parts of the cliff may have been used as kill sites at different times, depending on conditions and layout of the geography.

- Discuss seasonality of the hunts: Did people only hunt in the fall? What times of year would buffalo jump sites

be likely to be used? Archaeological evidence shows that jumps were most frequently used between late summer and early spring—even as late as February or March. How do they know? They looked at the development of fetal bones of unborn calves inside pregnant cows that were killed, and they also measured jawbones and tooth development of yearling calves. This told them how old the fetal and young animals were when they died. Assuming that buffalo are born in the spring, archaeologists can then tell what time of year the jump was used by the age of the fetal and yearling calves.

PART II: THE PRESENTATION

1. To the entire class, introduce the concept of the Jump Site Presentation (advertisement for their jump site) and establish criteria for a successful presentation. Criteria might be:

- a) Provide five reasons why this is a good jump site;
- b) Include a visual aid;
- c) Follow the format of a commercial: concise, fast moving, using jingles or slogans to reinforce message;
- d) Provide jump site with a name that tells something about it; and
- e) View some TV commercials in class and talk about what makes an ad effective.

2. Reconvene small groups. Each group gets to rework its buffalo jump model to incorporate any new information. Then each group develops its own advertising campaign—from the point of view of a group of hunters hoping to attract a bison herd to their jump site. Each advertising presentation should follow the criteria estab-

lished by the class and should be convincing and creative. The presentation should extol the virtues of the site: its design, how you would use it, what seasons you would like the bison to come, the features that make it the best jump site (ease of access for bison, rich grasses to offer, efficient processing area, and “a great archaeological dig site that will make you famous for generations to come!”

3. (May be done in a third session). Each group gives its presentation to the class. The class represents the community of buffalo on the Northern Plains, and everyone discusses the presentations.

EXTENSIONS:

4-8:

- Create a model archaeological dig at students' jump sites, using hand-made miniature bones and artifacts.
- Study bison biology.
- List other ways people use the land as a tool.
- Visit a buffalo jump in your area (Madison Buffalo Jump State Park and Ulm Pishkun State Park Visitor Center are the most accessible). You may want to have small groups present their advertising campaigns at the buffalo jump. (Teacher or parent might videotape presentations.)

This archaeology activity is adapted from a lesson plan created by Krys Holmes, Claudia Crase, and Geoff Wyatt for Montana Archaeology Week 1999, organized by the Montana Archaeological Society and sponsored by various federal, state, and private sources.

LESSON 2D—ARCH ACTIVITY: BUFFALO JUMP
STORY: WHEN BISON AND THE PEOPLE LIVED TOGETHER

Sometimes we were called buffalo, and sometimes we were called bison, but always we were important. We covered the Northern Plains in huge herds. In spring we moved into the bottomlands for their moist grasses. During winter blizzards, we huddled in the trees for protection. When fair winds blew, we spread out across the benches (a bench is a terrace or shelf of land) and buttes (buttes are small, isolated hills with steep sides), munching on the rich grassland and protecting our young.

The People lived among us, and they moved across the land just as we did. They needed us for food, for clothing, and for lodges, which they made out of our hides. And so they watched us very carefully. We watched only the lead female buffalo of the herd. Wherever she went, we went. When she ran, we ran. When she grazed, we formed a large circle around the little red calves to protect them, and we grazed.

Of all the People, there was one person we held in deep respect. That person was the Buffalo Runner. The Buffalo Runner was a very fast runner, a very brave soul, and he knew the buffalo herds and our ways. The Buffalo Runner had a special something in his heart, something no one else knew about. But the buffalo knew, and we respected the Buffalo Runner. Did I say "his"? Do you think the Buffalo Runner was always a boy? That is a secret. I will only say that each Buffalo Runner in each tribe was different. There were no two alike.

One day, out on the plains that you now call Montana, my herd was grazing along a low bench. There were hundreds of us! And our furry brown humps soaked up the autumn sun. We moved slowly, with the wind and the sun at our backs. We could smell water close by, a very pleasant smell. But because we were walking with the wind, we couldn't smell anything up ahead.

Out of the corner of my eye, I saw one of the calves trotting off up a slope. It made a funny bleating sound, like it was lost or hurt. Our lead female trotted up after it, and the rest of the herd followed her. We liked to stay together, and none of us can see well over long distances. Then I saw the odd little calf run off again in the same direction, making its hurt sound. The lead female became concerned, and this time, she ran after it. The rest of the herd was suddenly alert, and we all started trotting together.

Suddenly, the bulls from the back of the herd started running very fast, almost pushing us from behind. They had heard a wolf! We all put our heads down, and the whole herd started running, like a single animal with ten thousand hooves. We naturally followed the lead female. Where she swerved, we swerved, and where she turned, we turned. But she was following this little calf, which by now was running faster than any calf I have ever seen. And it was running upright on its hind legs.

It was the Buffalo Runner! It was



Fallen buffalo pictograph found in western Montana. This rock art may represent a buffalo jump.

not a calf at all, but a person with a brave heart and powerful legs and a calf's skin draped over his shoulders, running right in front of our speeding herd. We all ran together—the Buffalo Runner, the lead female, and the herd—as though we were one being. And behind us ran the wolf-like creatures—not wolves at all, but helpers of the Buffalo Runner, dressed in wolf skins. Together we raced, in one thundering movement, panicked by the surprise of it all, and herded along between two broken lines of rocks and branches laid out on the ground. Running between these lines of rocks, we skirted a little hill and came up over a small, rolling rise . . . And suddenly the Buffalo Runner vanished! The lead female was almost at his heels when she disappeared, too. I could barely see in the dust and the confusion, but it looked like they had fallen over a cliff. I tried to slow down, but the animals behind me pushed me forward toward the edge of the cliff.

Every animal around me was headed right for the edge. All we thought about was following the lead female. But one of the lines of rock guided us off to the side, splitting the herd into two sections. Most of the animals around me swerved as the rocks led us away from the cliff. Ahead of us spread a gentle slope. A few of the animals still plummeted over the edge. The rest of us thundered down the slope toward a field of grass below. There we slowed down and gathered as a herd again.

As the dust settled, we collected again, with much grunting and calling out between cows and calves.

Soon we could see hunters with their spears at the bottom of the cliff finishing off the animals that had fallen but hadn't died. Up among the rocks of the cliff, we saw the Buffalo Runner crouching on a ledge or stone outcrop. He hadn't fallen over the cliff at all, but had leapt onto this ledge where he watched the other bison cascade like a waterfall right beside him. We admired the Buffalo Runner for his bravery and agility.

Meanwhile the People were very excited. As the hunters killed the animals that had not died in the fall, the rest of the People moved in to clean and butcher them. Everyone worked very hard, even the children. The People spread out along the slope to do their part. The butchers worked near the base of the cliff, right where the buffalo had fallen, skinning the animals and carefully collecting their blood. They removed the meat and organs, saving the tongue and the backstrap for a special feast that evening. They cut the animals' bodies, their carcasses, into parts with edges of sharpened stone and carried the pieces to different work areas along the slope.

One group of people cleaned the heads and hooves. Farther down the slope, grandmothers cooked soup by heating rocks in a fire and dropping them into a stiff bowl made of buffalo hide. They dropped bones into the soup to cook the fat and marrow, the juicy material inside the bones. Before our eyes, the creatures that once were buffalo were transformed into hides, into food, into bone tools, into braided hair ropes, even into sinew—thread made from flesh or

muscle—for sewing and beadwork.

Our herd watched the People to make sure they did everything in the right way and were thankful. As the cows circled around the calves again and the bulls spread out across the valley, we put our heads down into the rich-smelling grass. Our herd felt strong and peaceful again.

All along the slope, between the kill site and the camp, the People worked together in groups, women and men, children and grandparents. The People celebrated their good fortune and praised the Buffalo Runner for a successful hunt. While they processed the skin and meat and viscera, or guts, they thanked all of us for working with them to make a successful hunt.

The autumn sun warmed the lush grasses of the meadow as our herd gathered again and began moving off toward the evening shadows. The Buffalo Runner went to his lodge, his heart full of thanks for our strong herd and for the well-being of his people.

Questions (to ensure that students can visualize the jump):

1. How did the buffalo get up on the cliff?
2. What did the Buffalo Runner do to get the herd to follow?
3. At this buffalo jump, a small hill rose up just before the cliff's edge. How was this hill advantageous to the buffalo hunters?
4. What was the purpose of the broken lines of rocks and branches? [Teacher note: The broken lines of rocks are called drive lines, and archaeologists are not certain exactly how they were used. They may have



been used in different ways on different occasions.]

5. Which way was the wind blowing? Why is that important?
6. How did the buffalo that were not killed get off the cliff?
7. Why would it be important for the People to have water close by?
8. What are five characteristics that make a good buffalo jump?

One artist's idea of a buffalo jump. Artist unknown. *Courtesy of the Museum of the Rockies.*

LESSON 2D—ARCH ACTIVITY: MONTANA INDIAN CULTURES

Grades: 3–8

Time: 40 minutes +

Content Area: history, writing, and
geography

Who: individual or small group

Materials:

writing paper

pencils

Montana maps

OBJECTIVE AND OUTCOME

- Students will learn the histories of and details about Montana's Indian tribes.
- Students will write letters to the Indian reservations in Montana, requesting information about the history of the people of that tribe. Students will locate Indian lands on a Montana map and identify geographic features.

ACTIVITY

1. Assign individual students, or small groups of students, to write to each Indian reservation in Montana requesting information about the history of the tribe.

2. Teach students the proper format for letters of request. See below for the addresses for Montana's Indian reservations.

3. Have students locate the Indian reservations on a Montana map and make a map of the reservations they chose to write to. They should include geographic features like rivers, mountains, and towns.

3. After the students receive the materials, have groups make presentations of what materials were sent and what they learned from them.

EXTENSIONS

3–8:

- Read literature about American Indians.
- Research other Indian tribes throughout the United States.

LESSON 2D—ARCH ACTIVITY: MONTANA INDIAN CULTURES (CONT.)
MONTANA INDIAN RESERVATION ADDRESSES

**Blackfeet Indian Reservation
(Blackfeet)**

Blackfeet Nation
P.O. Box 850
Browning, MT 59417

**Rocky Boys Indian Reservation
(Chippewa-Cree)**

The Chippewa-Cree Business Committee
Box 544, Rocky Boy Route
Box Elder, MT 59521

**Fort Belknap Indian Reservation
(Assiniboine, Gros Ventre)**

Fort Belknap Community Council
P.O. Box 249
Harlem, MT 59526

**Fort Peck Indian Reservation
(Assiniboine, Sioux)**

Fort Peck Assiniboine and Sioux Tribes
P.O. Box 1027
Poplar, MT 59255

**Flathead Indian Reservation
(Salish, Pend d'Oreilles, Kootenai)**

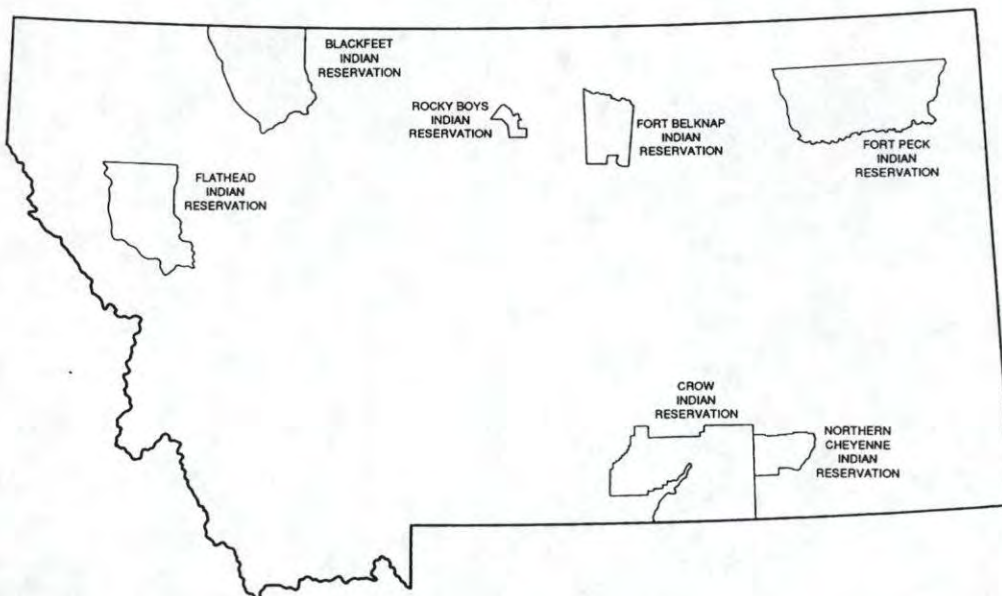
Confederated Salish and Kootenai
Tribes
P.O. Box 278
Pablo, MT 59855

Crow Indian Reservation (Crow)

Crow Tribal Headquarters
P.O. Box 159
Crow Agency, MT 59022

**Northern Cheyenne Indian
Reservation (Northern Cheyenne)**

Northern Cheyenne Tribe
P.O. Box 128
Lame Deer, MT 59043



This map shows the location of Indian reservations in present-day Montana. *Courtesy Montana Historical Society.*

LESSON 2E—NARRATIVE: WHO IS AN ARCHAEOLOGIST WHO STUDIES ANCIENT PEOPLE IN MONTANA?

Karma Cochran is an archaeologist who studies Montana's ancient people. As an enrolled member of the Gros Ventre Tribe, Fort Belknap Indian Reservation, Montana, Karma found becoming an archaeologist a choice she made easily. Her study of Native American people of the past allows her to preserve aspects of Indian culture lost through events in American settlement. She learns about tribal histories, then documents them for present and future generations. Karma says, "Native American people have been here a long time. Our history and culture is rich in tradition." Karma is proud of her heritage and shares it with others through her archaeological work.

Karma has been fascinated with archaeology for as long as she can remember, and she credits her mother for her interest. Her mother held a job with the Indian Health Service, providing health care to Native American people. The job required moving to various locations, and, her mother loved to travel. Karma recalls visiting museums and parks dedicated to archaeology and dinosaurs. As the youngest of ten children, she remembers her mom taking her everywhere! She saw some amazing places when living in Arizona near Canyon de Chelly National Park, an area very rich in cultural and archaeological sites.

Karma attended elementary and secondary schools in Montana, Arizona, and Wyoming. In 1997, she

Karma Cochran is an archaeologist who studies Montana's ancient people.

received her Bachelor's degree in Anthropology, and a minor in Native American Studies, from the University of Montana, Missoula. While in college she maintained good grades to participate in a cooperative education program with the Bureau of Indian Affairs (BIA). During summer and winter breaks from school, Karma received on-the-job work experience as a student trainee archaeologist. In return, the BIA helped pay her tuition and other college expenses. Upon graduation, she was hired full-time by the BIA. Karma is now working toward her Master's degree in Anthropology, and hopes to achieve a doctorate.

Karma's archaeological work with the Bureau of Indian Affairs covers Indian reservations in Montana and Wyoming. She has worked on all reservations in these two states. The artifacts and features she finds provide evidence of prehistoric and historic occupation, such as old houses dating back to the first homesteading. Karma has yet to work outside of the United States. She hopes to travel to South America and research the rich history of ancient people on that continent.

Karma finds all aspects of Montana's past and people intriguing. She prefers to study prehistoric archaeology because her people have inhabited this continent for thousands of years. She enjoys using historic archaeology to study cultural changes brought to Native Americans by contact with settlers, and she likes to

research early pioneer life.

Karma's favorite Montana site is Snake Butte, located on Fort Belknap Indian Reservation. Snake Butte provides an excellent representation and concentrated sample of Plains rock art. The images there range from handprints to a variety of animal forms. It is a good site for analyzing and comparison with other Montana rock art. Snake Butte also gives insight into elements important to early Native Americans, as well as their lifestyles and history. Other archaeological sites near Snake Butte offer more information that helps archaeologists interpret the area's use over time.

The most interesting sites Karma has found include those with both large rock alignments and tipi rings on Fort Belknap Indian Reservation. The rock alignments, or buffalo runs, are longer than any alignment she has seen. The tipi ring site includes over fifty rings and is, by far, the largest campsite she has surveyed. These sites provide insight into the area's inhabitation before reservations were established. They are located on Fort Belknap and confirm that early Native Americans used these places for hunting and camping purposes.

Karma states that one of her most exciting finds was not even archaeological. It was paleontological. She attended a class at Egg Mountain, near Choteau, Montana, where all kinds of dinosaur fossils are found. During a field trip, Karma noticed a bone sticking out of the ground. With help from the staff, she excavated the bone. She had found an adolescent duck-billed dinosaur leg bone or arm bone.

She thought it was pretty cool! But, what Karma would most like to find at a Montana site is archaeological: a mammoth bone with a Paleoindian Clovis point stuck in it. This would prove that humans occupied Montana and hunted these animals 12,000 to 14,000 years ago.

Karma's favorite method of analysis is to map sites using Global Positioning System (GPS) satellites. She likes the accuracy of pinpointing a site and using a computer to record information on the spot. GPS mapping offers an excellent look at the distribution of sites and features, and their patterns. Karma also likes experimenting with digital photography to record and analyze rock art sites. Storing the images in a computer provides a permanent record. This is important because rock art is fragile; erosion and vandalism can destroy these irreplaceable resources.

Karma is not sure if any of her job is easy, but she has the most fun doing archaeological surveys. She enjoys hiking in the mountains, looking at beautiful scenery, and working on her own. She also says it is great to work on the reservation she is from, and with Indian people on other reservations.

The most difficult part of Karma's duties is surveying when it is hot and she is tired from working all day. She would like to sit in the shade and relax, but the projects have to be completed! Sometimes report writing can be dull. She also finds that knowing and learning the many laws that apply to archaeology, and implementing them, is demanding. At times, it is difficult for Karma being a Native American and being an archaeologist. It is hard to

balance what she knows is right, and how she feels as an Indian, with the established government system and policies. Those policies dealing with land ownership and resource management are especially tough.

When asked what she believes the future holds for archaeology, Karma says: "I hope to see more integration of tribes in the field of archaeology, bridging the gap between the two. Montana archaeologists deal with many aspects of Indian peoples' ways. I think it is imperative that we be involved; after all, it is our history and culture. As we become more involved, some stereotypes Native Americans have concerning archaeology are changing. New, positive ideas about archaeology are appearing. It is good to see."

Karma suggests studying the sciences of geology and biology, as well as English and writing if you are interested in archaeology. Archaeology requires a lot of report writing, and being understandable is very important. Knowledge of math is also helpful. Archaeologists must know the history and geography of a region before they can understand its people and their societies.

Her message to you is: "We are all rich in history and culture; it makes us who we are. Archaeology and the study of human culture in Montana gives us a greater understanding and appreciation of our early ancestors. It teaches us about their ability to overcome seemingly insurmountable odds, and about their perseverance. Because of our ancestors, we are here and have developed into who we are. Be proud of your own, and others', history. It is

all special and in some way sacred. Preserve and protect all cultures.

"Sure, archaeology is a science, and scientific information is wonderful. But archaeology is the study of real humans and cultures that existed in the past. It is about people. Be respectful in dealing with cultural resources and learn what you can. As I was told, this connection between heart and mind is vital, not just in your work, but to you as a person."

In her free time, Karma enjoys camping, reading, and especially fishing. Her catch of the season was a ten-pound, twenty-two-inch walleye, at Cooney Dam. Students interested in archaeology may contact Karma at:

Karma Cochran
Bureau of Indian Affairs
316 North 26th Street
Billings, Montana 59101
406-247-7911
e-mail: cochran@mail.bia.gov



Karma Cochran is an archaeologist who studies Montana's ancient people. She is also an enrolled member of the Gros Ventre Tribe.