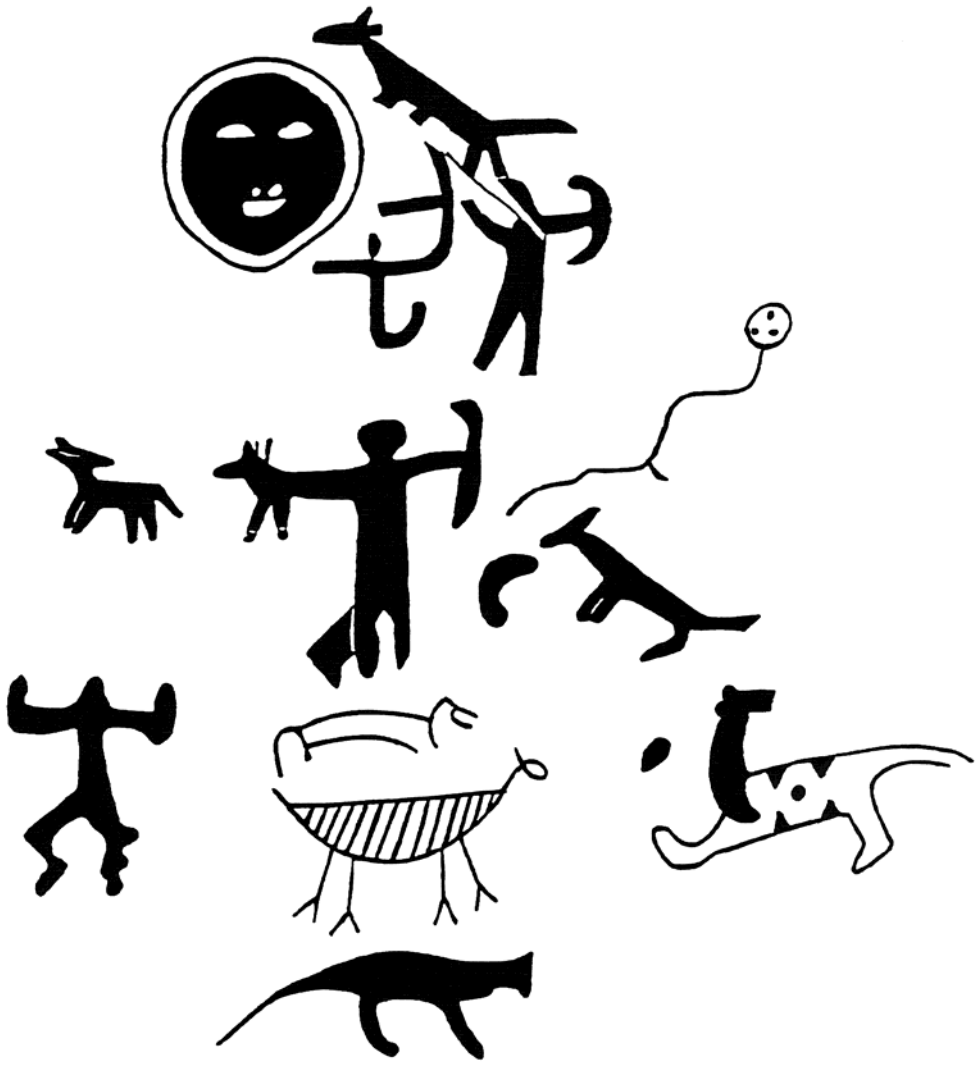
PROJECT ARCHAEOLOGY: PENNSYLVANIA

AN EDUCATIONAL STANDARDS BASED CURRICULUM FOR GRADES FOUR THROUGH EIGHT

LESSON PLANS

(FOR USE WITH STUDENT TEXT)



AN EDUCATIONAL INITIATIVE OF THE PENNSYLVANIA ARCHAEOLOGICAL COUNCIL EDUCATION COMMITTEE

THIS PROJECT IS SUPPORTED BY A GRANT FROM THE PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

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(FOR USE WITH STUDENT TEXT)

Project Directed and Edited by Renata B. Wolynec, Ph. D.

Contributing Authors:

Renata B. Wolynec, Ph. D.
Edinboro University of PA

Ellen Dailey Bedell, Ph. D.
Ellis School, Pittsburgh

Sarah Ward Neusius, Ph. D.
Indiana University of PA

Beverly M. Chiarulli, Ph. D.
Indiana University of PA

Joseph Baker
PA Department of Transportation, Harrisburg

Curriculum Development Specialist – Daniel J. Shelley, Ph. D., Robert Morris University, Pittsburgh

Project Illustrator and Text Illustration Coordinator – Bernard Werner
(Illustrations for Chapters 3, 11, 12, and 13 were provided by the authors.)

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October, 2003
Edinboro, Pennsylvania

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INTRODUCTION

About the Pennsylvania Archaeological Council The Pennsylvania Archaeological Council (PAC) is an organization of practicing professional archaeologists active in promoting public awareness about archaeology in Pennsylvania. This project is an important addition to the many public education projects undertaken by Education Committee members. These include co-sponsorship of PA Archaeology Month; an annual essay contest for students in Grades 4-9; a traveling exhibit series*; Project Archaeology: Pennsylvania, An Archaeology Curriculum for Grades 5-8*; and a traveling trunk and multimedia series to provide teachers with resource material for the curriculum.

Project History In 2002, Local History Project Support grant ME #230361 from the Pennsylvania Historical and Museum Commission (PHMC) was awarded to PAC for the development and production of Pennsylvania and national education standards based curriculum materials for students and teachers focused on Pennsylvania archaeology. The curriculum materials include a student reader, a separate lesson plan guide tied to specific standards, and a CD with all of the materials. To our knowledge, there is currently no archaeology based curriculum which addresses educational standards in Pennsylvania.

In keeping with the educational goals of the time, these curriculum materials address several needs. First, they were designed to facilitate reading comprehension. Second, they address powerful ideas, abilities, and issues which are identified by the state and national education standards. It is the position of the project team that Pennsylvania's archaeological past is interesting, exciting, and useful for addressing a variety of these standards.

The curriculum addresses four themes in 16 lesson plans and 13 student readings:

- Basic Concepts (Section One) -- archaeological methods, skills, and research;
- Pennsylvania Before the Europeans (Section Two) -- knowledge, attitudes, and values;
- Comparing Cultures (Section Three) -- similarities and differences among cultures;
- Stewardship of the Past (all sections) -- values associated with site protection .

Appendix A lists all recommended educational standards, whether or not they were specifically addressed. This recommended list may be useful to teachers who may wish to readapt these or other archaeology related materials to the standards. Appendix B provides a list of PAC archaeologists who are willing to address student groups and classes about archaeological issues.

How to Use the Materials The project team has attempted to produce student and teacher friendly materials. The student text is organized into short chapters with photographs and drawings where appropriate. A larger sized print was used to accommodate children with attention and vision problems.

The lesson plans were designed to minimize teacher anxiety in preparing and executing a lesson plan. The descriptive portion of the lesson plan includes the lesson title; recommended grade levels and content areas; recommended skills and standards to be addressed; a statement of the main concept; and materials and equipment needed. The actual lesson is divided into three sets of step-by-step activities:

- anticipatory set,
- procedure,
- closure.

Assignments, evaluation methods, adaptations, special suggestions, resources, and references are included. Whenever possible, visual aids in the form of copy-ready illustrations, exercises, vocabulary lists, etc. are included. A CD which includes all of the materials in electronic form is available as well.

Lessons plans 1 – 13 coincide with Chapters 1-13 in the student text. Lesson Plans 14, 15, and 16 are culminating lesson plans which are built on previous learning.

The actual lesson plans require an active collaboration between teacher and student. Active partnership in the learning process has been shown to enhance long term learning in students. Most lessons require that students read a particular portion of a chapter text, which is then discussed or considered in class. Students evaluate a few important ideas at one time, instead of trying to remember many unfamiliar ideas at once. Class discussion, cooperative group activities, as well as constructivist assignments will enable as many students as possible to be part of a discovery process. This will hopefully enable most students to not only learn in the short term, but remember the concepts under discussion.

The lesson plan format used in this project is somewhat unusual in that the student text portions are included in the body of the lesson plan. This will save the teacher time by eliminating the need to work with two books simultaneously. Illustrations are included in the lesson plan only if necessary for the teacher to present or understand a point. Because of many different levels of editing both books, there may be some editorial discrepancies between the student text and the highlighted text in the lesson plans. These have been eliminated as much as possible. If they exist, they do not alter content.

Whenever possible, the lesson plan tries to provide special "notes" for teachers, imbedded in the lesson plans. These "notes" may provide possible student answers to questions; provide guidelines for leading class discussion; or provide clarifications of the material under discussion. The team has assumed that many teachers have not studied archaeology or anthropology, and may therefore be uncomfortable using such material in class. The "notes" were created to provide teachers with much of the basic material needed.

Choosing the Lesson Plans Each lesson plan can be used singly or in combination with other lesson plans in the curriculum. A teacher may choose one, some, or all of the lessons depending upon the needs of the class and school. Although the team designed a

curriculum package of complementary lessons, each lesson plan can stand on its own if so needed.

Concurrently, a teacher can also choose which parts of a lesson plan to use in class. Once again, the activities for each lesson plan were designed to build upon each other. However, a teacher may still decide to use some of the activities and not others when considering the needs of the specific class of students. Every class has different needs, as does every teacher. Hopefully, there is sufficient flexibility to accommodate as many needs as possible.

Production Staff Dr. Daniel Shelley (the curriculum development specialist) identified the possible education standards to be addressed, suggested possible topics for the lessons, and developed a format for the lesson plans. Project director, Dr. Renata Wolynec refined these in consultation with Dr. Shelley and the writing team. Members of the writing team included Dr. Renata Wolynec, Dr. Ellen Bedell, Dr. Sarah Neusius, Mr. Joseph Baker, and Dr. Beverly Chiarulli. Writing assignments were made according to the expertise of each person as well as available time for the project. Draft student texts and lesson plans were reworked by the project director as needed. Each author's individual writing style was maintained as much as possible. Both student text and lesson plan draft manuscripts were submitted for evaluation to Mr. William J. White and Mr. Christopher A. Triola, of Parker Middle School in Edinboro, PA for their comments. Final drafts were submitted to Bernard Werner for the purposes of illustration and final assembly.

The archaeology curriculum will be made available to teachers at special workshops held at science, art, and social studies teachers' conferences as well as at teachers' in-service activities throughout the state. It is PAC's intention to eventually revise the next edition with teachers' comments and suggestions in mind, as well as to update any parts of the text.

Project Archaeology: Pennsylvania, An Educational Standards Based Curriculum for Grades Four Through Eight is a unique educational tool because it was produced by a partnership of archaeologists and educators. Each lesson plan and chapter provides teachers and students with up-to-date interpretations of the archaeological record, in a language easily understood by them, in a format easily used by them in the classroom. It is also unique because it focuses on what archaeologists have learned about the life of people in the past and not on a few select objects made by these people. It is hoped that this project will provide Pennsylvania's teachers and students with a useful and needed solution to three important questions:

- Who were the people who lived in Pennsylvania before the Europeans?
- How does archaeology help discover information about these people?
- Which educational standards are addressed by answering the first two questions?

Acknowledgements This project has been a true collaborative effort. Members of the writing team (Wolynec, Bedell, Neusius, Baker, and Chiarulli) gave generously of their time and expertise. The curriculum development specialist (Shelley) provided invaluable guidance in providing needed materials, without which this project would have been impossible. Consulting teachers (White and Triola) gave generously of their time in the midst of a very busy school year. Artist and illustrator (Werner) spent more hours than anyone can possibly imagine adapting images forwarded by the authors and creating new images for a visually appealing and learning friendly text.

Ariana K. Wolynec-Werner, a graduate student at the University of Chicago, spent many hours reading and editing the student texts. She focused her efforts on student understanding and engaged the project director in lengthy and vigorous discussions about possible misunderstandings which might arise from poorly worded ideas.

Dr. Ira F. Smith, III provided understanding and support whenever confronted with the project director's e-mails. The Pennsylvania Historical and Museum Commission provided major funding for this project. Dr. Mark A. McConaughy, PAC treasurer, was timely, as always, in the distribution of the funds.

Edinboro University of Pennsylvania provided the space and basic technical support for the initial production of the student text and lesson plans. Indiana University of Pennsylvania provided low cost duplication services which enabled the project to produce more copies of the materials than would otherwise have been possible.

Last but not least, all members of PAC and other members of the Pennsylvania Archaeological community must be acknowledged for their commitment to quality archaeological research in the state of Pennsylvania. Without their efforts and dedication there would be no information about the archaeological past of Pennsylvania.

Renata B. Wolynec, Ph. D.
Project Director

Edinboro, Pennsylvania
October 18, 2003

Setting the Stage

A **time line** is a very useful way of visualizing portions of time. Time lines help students remember dates. Today, when so many students are visual learners, a time line is a very useful learning tool. Students also learn well when they are partners in the discovery process which leads to learning. If a time line is so useful, why is there no time line in this curriculum?

There is no time line because teachers and students, together, will create the time line. It will be created throughout the lessons of Sections Two and Three. As you will discover, a simple time line would be inadequate for expressing the complexity of human behavior at any time people lived on this earth. By building a multi-continent time line, students will begin to glimpse just how complex and varied human behavior really was at given points in time within the past. It is a puzzle which they will assemble as the following lesson plans unfold, one culture at a time. When completed, students will have created a valuable cross-cultural visual learning and teaching tool.

Lesson Plan 16 will detail how this can be done. It is a lesson which both begins and ends this curriculum.

SECTION ONE -- BASIC CONCEPTS

Lesson Plan #1

Title of Lesson: What is Anthropology?

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social sciences

Skills Addressed: Reading, writing, oral communication, research, and cooperation

Main Concept: Anthropology is a science that studies people.

Objective(s): Students will be able to define anthropology, understand the holistic approach, identify and define the four parts of anthropology, and become aware of cultural diversity.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies - I.a., I.c., I.d.; II.d.; III.g.; IV.e.; V.a.; V.b.
Grade 5 Social Studies - I.a., I.c., I.d.; II.b., II.d.; III.g., III.h., III.k.; IV.c., IV.e.; V.a.,V.b.
Grade 6 Social Studies - I.a., I.c., I.d.; II.d.; III.g., III.h.; IV.c., IV.e.; V.b.

Pennsylvania Department of Education (PDE):

Grade 7 History - 8.1.9 A and 8.1.9 B
Grade 8 History - 8.1.9 A and 8.1.9.C

Materials/Equipment:

*Student Text: "What is Anthropology?" (Chapter 1)
*Blackboard, whiteboard and/or overhead projector
*Blank transparency, dry erase marker, and/or chalk
*Vocabulary transparency or individual student copies of vocabulary
*Four fields of anthropology transparency
*Cake model transparency
*Internet and computer access for students (optional)
*Library
*Poster board (one for each cooperative group – assignment option 1)
*Poster or drawing paper (ten for each cooperative group – assignment option 2)
*Crayons or magic markers (one set for each cooperative group)
*Glue (one for each cooperative group)

*Scissors (two for each cooperative group)
*Materials for writing short essays (for each student)

Anticipatory Set:

1. Tell students that they will be learning about anthropology. Anthropology is the science that studies people.

2. Ask students, "What are the different things we can learn about people?"

3. As students respond, write these ideas on the blackboard or overhead transparency.

> **Note:** Expect responses such as diet, nutrition, resources used, family life, religion, government, clothes, tools, education, etc.

4. Ask students for examples of different cultures from the around the world.

5. Write their answers on the board or overhead transparency.

6. Ask students to write a short paragraph discussing why it is important to learn about people in other cultures.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) This can be done through silent reading, choral reading, or you can read it with them. The assigned readings are included for your reference. Each of the following sections will indicate the necessary student readings and a focus question to facilitate discussion and information that you, the teacher, will use to clarify and elaborate on the reading material. You may want to get some Cooperative Groups working together as the students become familiar with the concepts and terminology of anthropology.

1. Student Text # 1:

> By this time in your education you have learned a lot about science. Science is a way of studying the earth, stars, plants, animals, and so much more. You may be surprised to learn that there is also a science of people. **Anthropology** is the name we give to the science that studies people. Of course, there are other professions that can help us learn about people. Sociologists study how people work together as part of a society. Historians study written documents and the things that people remember in order to learn about their past. Biologists study the different parts of the human body and how these parts work. Philosophers study how people think about the world they live in. Psychologists study how the human mind works.

- Ask students, "Can you think of any other professions that study people?"

> **Note**: Expect responses such as teachers, doctors, economists, etc.

- Review the definition of anthropology from the vocabulary transparency.

2. Student Text #2:

> Anthropology uses a special way of studying people called the **holistic approach**. When anthropologists use the holistic approach they study people everywhere in the world, at all the times people have lived, and everything that people do and are. This means that anthropology does not choose only one kind of person, or one time in the past, or one kind of human behavior. This science studies everything about people**.**

- Ask students to imagine that humans are a layer cake made up of three separate layers of cake, glued together with frosting.

> **Note**: Draw the cake on a blackboard (or use the overhead transparency) as the explanation continues. It is best to draw the cake as the discussion proceeds. Students learn one step at a time. The bottom layer of the cake is human biology. The middle part of the cake is how the human mind works and learns. The top layer of the cake is how people live and work together as part of a society. The frosting covering the cake is how people think about the world they live in. Each of these layers of the cake can be studied separately. Biologists, physiologists, and geneticists study the bottom layer. Psychologists and educators study the middle layer. Sociologists, historians, political scientists, and economists study the top layer. Philosophers study the frosting. What do Anthropologists do? Anthropologists take a slice of the human cake and study how the different parts of the cake work together to form the slice of cake.

- Tell students, "Imagine that you are given all of the parts of the cake before it is put together. First you eat layer one, then layer two, then layer three, then the bowl of frosting. What if, instead, you get a slice of the cake already assembled with frosting?"

- Ask students, "Do you think each of these ways of eating the cake will taste differently?"

> **Note**: Tell the students that the parts are still the same, but a finished slice of cake will taste differently. By using the holistic approach, anthropology studies the relationship between the parts and therefore gets a very different "taste" about what people are. (A transparency of the cake is included as a model for the teacher to use.)

- Review the definition of holistic approach from the vocabulary transparency.

3. Student Text #3:

> Of course, it is impossible to study everything about people all at once. Therefore, the field of **anthropology is often divided into four parts**: cultural anthropology, physical anthropology, linguistics, and archaeology.

- Show transparency with the four sub-fields of anthropology and review the four parts.

4. Student Text #4:

> **Cultural anthropology** studies the cultures of living and historically known people. **Culture** is a way of life that is learned and shared by a group of people who live and work together and share a common territory. This group of people is called a **society**.

Because we are not born with our culture, we have to learn the rules of our culture while we are growing up. What we choose to eat, the clothes we wear, the tools we use and make, the houses we live in, our beliefs, the work we do, the language we speak, who we can call friend and family, and good manners are all part of the culture that we learn and share.

All human cultures are not the same. What may be good manners in one culture may be rude in another culture. For example, in the United States, we write thank you notes or say thank you to someone who has given us a gift. If we don't do this, the person who gave us the gift might think that we are rude. Among the !Kung San of the Kalahari Desert of South Africa, to say thank you for a gift is considered rude. It suggests to the person that gave the gift that somehow she is not generous and that you did not expect her to share. In both cultures, people enjoy receiving gifts, but the correct response to a gift is different.

We share our culture with people who are our ancestors (such as our parents), with the people we live with today, and with our descendants (such as our children). Yet, this is not always the same culture. Culture is always changing. Human needs, opportunities, tools, and attitudes change through time. Everyone has heard someone say: "well, when I was your age….." They are only saying that things were once different. Yet you probably share today's culture with them. In fact, you are sharing a changing culture with them.

Cultural anthropologists can study a culture as it exists in one time, or they can study how a culture changes. Both kinds of study provide us with knowledge about the nature of culture and its importance to people.

- Tell students that their own culture has changed as they have been growing up.

- Ask the students, "Can you give some examples of things that have changed?"

  Note: Answers can include such things as toys, cars, clothes, computers, electronic games, etc. Answers should be as specific as possible. For example, specific types of toys such as action figures (e.g. GI Joe) have gotten bigger; SUVs have become popular; etc.

5. Student Text #5:

Physical anthropology studies the biology of human groups (populations). Physical anthropologists are interested in describing and explaining our physical and genetic characteristics. Some study living people. They try to learn about human diseases, nutrition, and why there are differences among people. Others study people who lived in the past by studying their skeletons and fossil bones. They try to understand why people have changed through time. Still others work with the police to help solve crimes. Some physical anthropologists study monkeys and apes in order to discover how they interact with their environments. Others study how the environment affects human biology and human characteristics.

- Ask students, "Were people alive at the same time as the dinosaurs?"

  Note: Tell the students that dinosaurs disappeared 65 million years ago while the ancestors of humans first appeared about two million years ago. People like us may have appeared as early as 100,000 years ago.

- Ask students, "Do you think anthropologists study dinosaurs?"

  Note: The answer should be no. Anthropologists study people.

- Review the definition of anthropology from the vocabulary transparency.

6. Student Text #6:

> **Linguistics** is the study of language. Linguistic anthropologists study the sounds, rules, meanings, and relationship to culture of languages all over the world. Anthropologists estimate that there may have been as many as 2,000 languages that have been spoken by people. Many languages disappeared so long ago that we will never be able to study them.
>
> Babies are born with the ability to learn language. But the particular language they speak must be learned, just as culture must be learned. If you had been born in Japan to a Japanese family, Japanese would have been your first language. In some cultures, children learn to speak more than one language. A child born to the Arunta culture of Australia would learn both the Arunta language (the language of the native culture) as well as English (the official language of Australia).
>
> Language is an important tool for learning a culture. Some languages are written and spoken. Others are only spoken. Some languages, such as American Sign Language, use hand symbols. All are important tools for communication.
>
> There are many kinds of linguistic anthropologists. Some study how a particular language has changed through time or how the meaning of words has changed in a language. Others try to describe a particular language including its sounds and grammar. Most try to understand how a particular language meets the needs of a particular culture.

- Ask students "How many different languages are spoken in the United States, today?" "What are some of these languages?"

> **Note**: There are as many languages spoken in the United States today, as there are cultures from which our citizens or their ancestors came from. These languages include English, Spanish, French, German, Turkish, Farsi, Greek, Polish, Ukrainian, Mandarin Chinese, Hindi, Urdu, Arabic, Swahili, Navajo, Nootkan, and hundreds more.

- Tell students that some groups in the United States may have a special way of using words in a language.

> **Note**: For example, mashed potatoes, corn, Sierra cement, boiler plate, skree, and powder may not mean very much to us as a group of words. For the professional downhill skier, these words suggest different kinds of snow surfaces. Identifying the quality of snow may help save a skiers life because it will determine the kinds of tools and skiing style she may need to use. Inuit (Eskimo) use at least 10 different words for snow.

- Tell students that sometimes words change their meaning depending upon the situation they are used in.

> **Note**: For example, the word "mouse" may mean an animal or a tool for communicating with your computer. We may see the color "green" while an artist may call it something else. How many words for green can you identify in an artist's palette?

- Ask students, "Can you identify other professions that have special words?"

Note: Their responses might include doctors, football players, teachers, etc.

7. Student Text #7:

Archaeology is the study of past cultures from the things people have left behind. Historical archaeologists study people who have writing. Prehistoric archaeologists study people who lived before writing was invented. Over 99% of the time people have been on the earth occurred before writing. Although these people did not write, they left us clues such as their tools, houses, symbols, ceremonial objects, and trash. The places where these remains are found are called archaeological sites. By discovering these remains and paying careful attention to where they are located (context) archaeologists can learn about the history of a culture, the way of life of a people, their ideas, and how their cultures changed.

An archaeologist is a kind of detective, always looking for clues about cultures of the past. Archaeologists often work with scientists such as chemists, ecologists, zoologists, botanists, and geologists in order to discover how people interacted with their environment.

An archaeologist does not collect archaeological remains as a hobby. The scientists who are archaeologists try to solve research problems or answer questions about people who lived in the past by studying their remains.

Archaeological remains are very fragile and non-renewable. We have all learned about plants and animals that are extinct. They are gone forever. Archaeological sites that are not carefully studied are also gone forever. The people who created the remains are no longer alive. They cannot produce new remains. An archaeological site that is destroyed cannot be replaced. Therefore, archaeologists are very careful when they study sites and the things found at sites. Many archaeologists now work to help protect archaeological sites.

- Ask students, "Do you know of any archaeological sites in the community?"

- Tell students to write a short paragraph discussing why they think it is important to protect archaeological sites.

8. Student Text #8:

There are special anthropologists called **applied anthropologists.** They include anthropologists from all of the four areas of study in anthropology. They help people all over the world solve a variety of problems. For example, physical anthropologists work with medical scientists to help stop the spread of diseases. Linguistic anthropologists work with teachers to help immigrant children learn a second language. Cultural anthropologists work with doctors to help them provide medical services to immigrants from other cultures. Archaeologists work with the Pennsylvania Department of Transportation to discover archaeological sites that may be destroyed by a new road.

Today, anthropology is more than the science of people. It is a science that can help people live a better life today and in the future.

- Review the four fields vocabulary words from the vocabulary transparency.

Closure:

1. Ask the students, "What did you learn today?"

2. Write their answers on the blackboard or overhead transparency.

- **Option 1**: Lead a discussion by asking the question, "How can anthropology help us be better-informed citizens of the United States and the world?"

- **Option 2**: Ask students to write a short paragraph answering the question, "How can anthropology help us be better-informed citizens of the United States and the world?"

3. Ask students, "Why do you think archaeology is a part of anthropology?"

> **Note**: This question allows the students to prepare their thoughts for the next chapter about archaeology.

Assignment:

1. Divide students into cooperative groups (4-5 students per group).

2. Tell each group to study two cultures that are not theirs and compare how they are similar to and different from each other; how are they similar to and different from their culture?

> **Note**: Students may use the library or Internet to gather their information.

> **Note**: Approve the cultures in advance so that there are no duplications. Topics for comparison can include language, population size, geographic location, food, clothes, music, tools, family life, religion, government, etc.

- **Option 1**: Tell each group to present their results in poster form (one or multiple posters).

> **Note**: Posters can be exhibited in the classroom or library as an independent presentation or as part of a world cultures week presentation.

- **Option 2**: Tell each group to prepare an illustrated book (ten pages or so) describing and comparing the cultures.

> **Note**: The books can be made available to other students in the form of a cultural diversity library in the classroom.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials can be assembled in a student/group portfolio. A vocabulary list and content terminology can also be assessed through objective means. Compare the essay answers generated in the "Anticipatory Set" with the discussion or essay in point 2 of the "Closure." Success of the lesson can be ascertained by an improved quality of the discussion and essay in "Closure."

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

www.saa.org Society for American Archaeology

www.aaanet.org American Anthropological Association

Ember, Carol R., Melvin Ember, and Peter N. Peregrine. *Anthropology*, 10th edition. Prentice Hall, 2002.

Scupin, Raymond and Christopher R. DeCorse. *Anthropology: A Global Perspective*, 4th edition. Prentice Hall, 2001.

Transparency – Vocabulary

Lesson 1 – Vocabulary

Anthropology is the name we give to the science that studies people.

The **holistic approach** studies people everywhere in the world, at all the times people have lived, and everything that people do and are.

Culture is a way of life that is learned and shared by a group of people who live and work together and share a common territory.

A **society** is a group of people who live and work together and share a common territory.

Cultural anthropology studies the cultures of living and historically known people.

Physical anthropology studies the biology of human groups (populations).

Linguistic anthropology is the study of language.

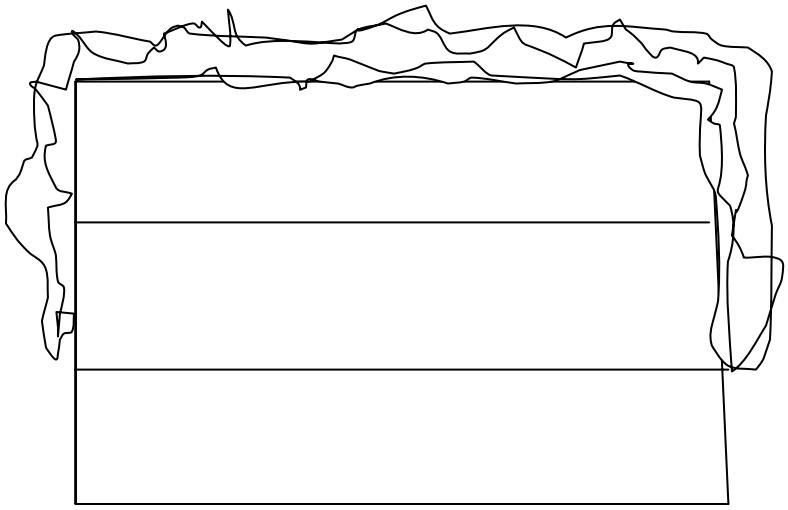
Archaeology is the study of past cultures from the things people have left behind.

Transparency – Four Fields of Anthropology

FOUR FIELDS OF ANTHROPOLOGY

cultural anthropology	physical anthropology
linguistics	archaeology

Transparency – Layer Cake Model



Key: Frosting: How people think about the world they live in

Top Layer: How people live and work together as part of a society

Middle Layer: How the human mind works and learns

Bottom layer: Human biology

Slice of cake: Draw two vertical lines on the cake showing the slice of cake

Lesson Plan #2

Title of Lesson: What is Archaeology?

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social studies and anthropology

Skills Addressed: Reading, writing, oral communication, critical thinking, and cooperation

Main Concept(s): Archaeology is the systematic study of the past, from the remains of human behavior, given certain specified objectives.

Objective(s): Students will be able to define archaeology, understand the different kinds of past studied by archaeologists, identify remains of human behavior which archaeologists study, and identify research objectives.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies – II.d.
Grade 5 Social Studies – II.d.
Grade 6 Social Studies – II.d.

Pennsylvania Department of Education (PDE):

Grade 7 History – 8.1.9. A-C
Grade 8 History – 8.2.9. B and C

Materials/Equipment:

*Student Text: "What is Archaeology?" (Chapter 2)
*Blackboard, whiteboard, and/or overhead projector
*Blank transparency, dry erase marker, and/or chalk
*Vocabulary transparency
*Drawing paper and crayons or colored pencils (one set for each student) (optional)
*Materials for writing a short essay (for each student)
*Internet and computer access (optional)
*Library (optional)
*Visiting archaeologist (optional)
*Teaching trunk (optional): stone tools, pottery, fire-cracked rocks, animal bones, shell, nut fragments, seeds, animal skins, and feathers (contact: wolynec@edinboro.edu)

Anticipatory Set:

1. Tell students that they will be learning about archaeology.

> **Note**: Most students have heard the word, have seen a television program, or have seen archaeological materials in a museum or at a site. They already bring an idea to the classroom. This idea has to be brought out.

2. Tell students to close their eyes and clear their minds, think of nothing! Then ask, "When you think about archaeology, what one or two words come to your mind?"

3. Go around the room and ask each student what their words are. Allow each student a chance to respond.

4. As the students respond, write these words on the blackboard or overhead transparency.

5. **Alternative**: Have students draw a picture of an archaeologist at work.

> **Note**: Collect pictures and keep them for the students because they will look at them later.

6. Ask students, "Why is it important for us to study the past?"

> **Note:** Expect responses such as the past is interesting; we don't want to repeat the mistakes of the past; etc.

7. Tell students that archaeology is a science, which studies people who lived in the past. It is part of a larger science called anthropology.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) This can be done through silent reading, choral reading, or you can read it with them. The assigned readings are included for your reference. Each of the following sections will indicate the necessary student readings, a focus question to facilitate discussion and information that you, the teacher, will use to clarify and elaborate on the reading material. You may want to get some Cooperative Groups working together as the students become familiar with the concepts and terminology of archaeology.

1. Student Text #1:

> Almost everyone has heard of **archaeology**. Newspapers and magazines often write about important archaeological discoveries. Television programs show us archaeologists at work or the places where discoveries have been made. Museums display the things archaeologists have found. Television news tells about old shipwrecks that have been discovered. In many cases the word archaeology is used. In the first lesson, you learned that archaeology is part of the science called anthropology. It is the study of past cultures from the things people have left behind. It is the systematic study of the past, from the remains of human behavior, given certain specified objectives. Let's explore some words in this definition.

- Ask students, "What does this tell us about archaeology?"

- Go around the room and ask each student his or her answer. If a student has nothing to say he or she should say, "pass."

2. Student Text #2:

> What is the **past**? The past is that part of time that has already happened. Archaeologists study three kinds of past: prehistoric past, historic past, and living past.
>
> The **prehistoric past** is that part of human time before the invention of writing. Archaeologists who study the prehistoric past try to learn everything they can about the people who lived before writing in every part of the earth. They study what the people ate, how and where they got their food, how they protected themselves, how they built their houses, how they interacted with their environment, how they made and used tools, what they believed, and more. Archaeology is the only science which has found a way to study people who lived before there was writing.

- Write the words prehistoric past, historic past, and living past on the board or overhead transparency.

- Ask students, "Do archaeologists study dinosaurs?"

> **Note**: Many of their responses will be based on TV and movies, which are misconceptions!

- Tell students that archaeologists study people. Dinosaurs lived at a time before there were people, over 65 million years ago. The earliest human ancestors appeared on the earth only three million years ago. Some movies about the prehistoric past show people fighting dinosaurs. They entertain us with a good story, but an impossible story. There were no people alive when dinosaurs roamed the earth.

3. Student Text #3:

> The **historic past** is that part of human time after writing was invented. Archaeologists use maps, diaries, journals, government records, business records, religious writings, poetry, books, scribbles, court documents, tax records, and more. They discover the details of human life that are missing from the written records. Archaeologists also discover if what was written actually happened and help solve mysteries about the past when no writing can be found.

- Ask students, "Why do we need archaeology to study the historic past if writing already exists?"

- Go around the room and allow each student a chance to respond.

> **Note**: Not everything is written down. Historical records are biased. Not everything has been saved. Not everything that is written is true. Not all writing is readable or understandable. Words change their meaning. Some writing has not yet been deciphered.

4. Student Text #4:

> The **living past** is that part of human time which each one of us creates by living our lives. We also use and make tools, interact with our environment, build houses, have beliefs, organize ourselves into a society, and protect ourselves. You started this lesson in the past, even if it was only five minutes ago. Some archaeologists study the landfills of our cities and how we change our environment and landscape to learn more about us. Others do experiments to see how people in the past made their tools, moved large stones, painted cave art, and more. They hope to learn how these things could have been done in the past.

- Ask students, "Why can't we just ask people about what they do in a survey?"

- Go around the room and allow each student to respond.

> **Note:** Tell students that social scientists have discovered that people don't always tell the truth about what they do. Sometimes they give the answer they think they should be giving. For example, almost everyone knows that some food is good for us while other food is not healthy. Yet, not everybody eats healthy food all of the time. However, when asked about their eating habits on a survey, people will often write about the food they should be eating and not what they actually eat. An archaeologist studying a landfill site will find the remains of food and be able to get a much more accurate idea of people's eating habits.

5. Student Text #5:

> All archaeologists study the things that people have left behind. They sometimes call these things the **remains of human behavior**. There are three different kinds of remains of human behavior which archaeologists study: archaeological sites, things found at archaeological sites, and archaeological context. All of these contain messages about the past, which the archaeologist tries to discover.
>
> An **archaeological site** is any place, large or small, where people have left something behind. It can be as large as a city or as small as an overnight campsite used only once.
>
> Do you think that a big site is more important to archaeologists than a small site? In Pennsylvania, a small site that is ten thousand years old may be very important because we know very little about the earliest Native American settlers**.**

- Write on the board or overhead transparency the words "remains of human behavior" and list under them archaeological sites, things found at archaeological sites, and archaeological context.

- Ask students, "Do you know of any archaeological sites in or near our community, or do you know of any archaeological sites elsewhere?"

- Make some suggestions to facilitate the discussion if necessary.

6. Student Text #6:

> **Things found at sites** include portable artifacts, non-portable artifacts, byproduct materials, and ecofacts. An **artifact** is anything that has been changed by people either by using an object or shaping it for a purpose. **Portable** means that it can be moved and carried without changing it. Examples of portable artifacts include tools, personal ornaments, ceremonial objects, and more.

- Write on the board or overhead transparency "things found at sites" and list under them portable artifacts, non-portable artifacts, byproduct materials, and ecofacts.

- Tell students to think of an example of portable artifacts.

- Allow each student to name at least one artifact.

> **Note:** Answers can include such things as eye glasses, pottery, dishes, soda cans, chewing gum wrappers, chairs, jewelry, earrings, backpack, shoes, arrowhead, etc. It is important that students do not focus on Native American materials or prehistoric materials only. They should recognize that they too use portable artifacts.

- **Optional:** Pass around stone tools and pottery from the teaching trunk.

7. Student Text #7:

> A **non-portable artifact** is sometimes called a **feature**. You cannot move it or carry it without destroying it or taking it apart. Features can tell us about human activities, how people used their land, how they organized their activities, and more. A hole in the ground is a good example of a feature. Can you pick up a hole in the ground? You can remove its contents. You can dig away the sides. But, you can't pick it up. A hole is, after all, just space. Yet there are many archaeological sites with evidence of holes in the ground. Other examples of features include houses, mounds, fences, and campfires.

- Ask students, "What can you put in a hole in the ground?"

> **Note:** Answers can include such things as a fire for warmth or cooking, a house (pit house or basement), food, an oven for cooking food, objects (to hide them), a fence post, water (pond, reservoir, well, irrigation ditch), human waste, etc.

- Allow the students some time to discuss and respond to the question. The answers should create a wide variety of possibilities!

8. Student Text #8:

> **Byproduct materials** are the remains that are created when people make or use artifacts. Food trash, stone flakes, wood ash, scratch marks, and blood are examples of byproduct materials. When you eat your chicken dinner, only the bones are left behind. When you use a knife, you scratch the knife surface. When you burn wood in a campfire, all that remains is wood ash and burned soil. When the butcher cuts meat, his tools may have some blood on them. When a stone spear point is made, bits of stone called flakes are removed from the piece of stone. All that remains after the spear point is taken away are the flakes. Blood on a spearpoint can tell us what kind of animal was killed. By studying byproduct materials archaeologists can learn about the actual activities, which produced them.

- Ask the students to think about the garbage they produce everyday.

- Ask students, "What kind of garbage do you and your family produce, what does the classroom (school) produce? If archaeologists find this garbage one hundred years from now, what will they learn from it?"

- Allow the class to discuss and respond to these questions.

- **Optional:** Pass around fire-cracked rocks, animal bones, and shell from the teaching trunk.

9. Student Text #9:

> You may be surprised to learn that archaeologists also study **ecofacts** or evidence of the natural environment. All people use and change their natural environment, everywhere in the world. They have to deal with the weather; collect and use plant, animal, and mineral resources; and need water. Because the natural environment is such an important part of everyone's life, it is important that archaeologists learn about the natural environments of past cultures. Archaeologists work with geologists (soil and mineral scientists), botanists (plant scientists), palynologists (pollen scientists), malacologists (snail scientists), zoologists (animal scientists), and others to answer questions about the environment. For example, by studying plant pollens, they

can learn about the climate and growing season. By studying snails in the soil, they can learn about the kinds of plants that lived in an area because certain snails like to eat certain kinds of plants and not others. Because knowledge of the natural environment is important, an archaeologist must collect ecofacts in addition to all of the other remains of human behavior. Without ecofacts, important knowledge of the past will be lost.

- **Optional**: Pass around seeds, seashells, bones, feathers, and fur fragments from the teaching trunk.

- Ask students, "How is the environment is important to us?"

- Allow the students time to respond and discuss the question. Try to direct the discussion to clarify facts and information.

- Next, ask students, " How do you think the natural environment was important to the prehistoric Native Americans of Pennsylvania?"

- Allow the students time to respond and discuss the question. Try to direct the discussion to clarify facts and information.

10. Student Text #10:

None of these remains are useful to the archaeologist without **context**. Context is a special kind of environment. Archaeological context refers to the environment within which sites and things found at sites are located. When you ask, "How old is it?" you are asking a question about the environment of time. When you ask, "Where did you find it?" you are asking a question about the environment of space. When you ask, "What did you find next to it?" you are asking a question about the environment of culture. Without context, even the most beautiful decorated pot and arrowhead are only things. Archaeologists can only measure them and describe them. They cannot be certain of the objects' age, where the remains came from, or what they were used for. For example, an antler found with pieces of wood charcoal, hammerstones, stone flakes, and a broken spearpoint might have been used as a soft hammer. That same antler found next to a skeleton in a burial might be something else. Archaeologists can only know the difference if they pay attention to context. Without context, objects are just "stuff." Without context, the archaeologist cannot answer important questions about the past. Therefore, archaeologists are very careful to record the exact location of every kind of remain of human behavior they collect.

- Tell the students to think about their bedrooms. Is there something in their bedroom that can tell us if they are a boy or a girl, about their interests, hobbies, collections, etc?

- Allow the students time to discuss and elaborate on the question. Be prepared for some interesting possibilities!

- Next, tell the students to imagine that somebody removes an important object from their room and puts it in his or her house.

- Ask students, "Can we still learn about you and your interests if we find that object in the stranger's house?"

- Allow time for the students to respond and discuss the question.

- Ask students, "What if someone removes all of the arrowheads from an archaeological site and puts them in their house. How will this effect what archaeologists can learn about the people at the site?"

- Have the students give examples of scenarios that might result because of this tampering with the past.

11. Student Text #11:

> What kinds of questions do archaeologists ask about the past? They ask questions about culture-history, lifeways, cultural change, and how people thought in the past. When they study **culture-history** they ask the questions: who were the people, when did they live, where did they live, and what characteristics define their culture. When they study **lifeways**, archaeologists want to learn about the day-to-day, year-to-year, season-to-season, and month-to-month patterns of activities of people. Archaeologists who study **cultural change** often study the natural and social environments with which a culture interacts. They want to learn not just what has changed, but why certain parts of a culture have changed. Archaeologists who study **how people thought** in the past try to understand the symbols people used, what they believed about their world, and how men and women interacted in the culture.

- Ask the students, "Can you give an example of how our culture has changed through time?"

- Allow the students time to respond and discuss the question. This may be a point were you can get some Cooperative Groups working together as the students become familiar with the concepts and terminology of archaeology.

- Tell the students to think about how the activities of their life change day-to-day, season-to-season, etc.

> **Note:** You can ask specific questions, such as the following, to trigger their thinking: "Do you eat special foods on certain holidays?" "Do you wear the same clothes all year round?" "What sports do you play in winter that you don't play in summer?" "Are your activities the same from summer to winter?" "Which are the same?" "Which are different?"

- Allow time for student responses, discussion, and/or group interactions.

- Ask the students, "How do you think Pennsylvania Native Americans who were hunters and gatherers or farmers changed their activities throughout the year?"

- Allow time for student responses, discussion, and/or group interactions.

12. Student Text #12:

> How do archaeologists study past cultures? They study the past **systematically**. This means that they study with a plan or **research design**. Their plan must have several important parts. First they have to decide what question they are trying to answer about the past. Second, they have to identify the best way to answer the question. This includes deciding what sites they will study, finding out what has already been learned, what remains they will collect, the best ways to protect these remains, what kinds of tools they will use, who will be part of the team, who will do the work, what other scientists to include, how to record the information they collect, how their collected remains will be studied, where they will be studied, and more. The third part is the

actual analysis or study of what they have found. The final part of the plan is to write a report about their work so that other archaeologists can learn from them.

- Ask the students, "What would you like to know about the Native Americans who lived in Pennsylvania before the Europeans came?"

- The students can respond to this question individually or, as a group. For variation, you may want the to write it on a card and place them on the front board and/or bulletin board.

- Ask the students, "What will happen to our knowledge of the past if archaeologists do not share their information by writing a final report?"

- Allow the students time to respond. This is a good focus question for a whole-class discussion.

- Ask the students, "Do you think that archaeologists should share their discoveries with you?"

- This question could make for some exciting and thought provoking discussion. You may want them to "role-play" a scenario were they are an archaeologist who has made a rare find. Should they share it? What if it is worth a lot on money? Does this change how they think about the find? Lead them to a discussion that has them thinking ethically about the issues!

> **Note**: Professional archaeologists do not buy and sell artifacts. This kind of behavior is defined as unethical by the Society for American Archaeology and other major archaeological organizations around the world.

Closure:

1. Review vocabulary words using overhead transparency or individual student copies of vocabulary. **Optional**: Show research design transparency on page 45 of this book.

2. Have the students write a short essay discussing what they think happens to remains such as house features, garbage, and ecofacts when someone digs a site looking only for arrowheads and pretty pottery? What kind of evidence of human activities is lost? Why is this evidence important?

3. **Optional**: Invite an archaeologist to class in order to discuss how he or she designed a particular archaeological project and what was learned.

Assignment:

1. Divide students into cooperative groups (4-5 students per group).

2. **Option 1:**

- Tell each group to find a site report or article about archaeological work using library sources or the Internet.

- Tell each group to summarize the article by identifying the questions archaeologists asked or problem they wanted to solve, the remains of human behavior they studied, how they did their work, and their conclusions.

- Students report their findings to the class in a short oral report, poster, written essay, or Power Point presentation.

3. **Option 2:**

- Tell students that they are archaeologists living one hundred years from now who have discovered the remains of their school.

- Tell each group to develop a research design or plan of study focusing on the kinds of research questions group members might ask, the kinds of remains they would collect, and who would be part of the team.

> **Note:** Students have not been given sufficient information to develop a data recovery plan.

4. **Option 3**:

- Tell each group to access the Society for American Archaeology website at www.saa.org. and summarize the information that is in the website in an oral report or poster, in order to discover what other things archaeologists are interested in, in addition to the material that was presented in the student text.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials and artifacts can be assembled in a student/group portfolio. A vocabulary list and content terminology can also be assessed through objective means.

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion: Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class.

Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

www.saa.org Society for American Archaeology

www.archnet.asu.edu Archaeology resources from Arizona State University

Renfrew, Colin and Paul Bahn. *Archaeology: Theories, Methods, and Practice*, 3rd edition. Thames & Hudson, 2000.

Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades.* United States Department of the Interior, Bureau of Land Management, 1993.

Local university Anthropology Department or contract archaeology company

Transparency – Vocabulary

Lesson 2 – Vocabulary

Archaeology is the study of past cultures from the things people have left behind.

Archaeology is the systematic study of the past, from the remains of human behavior, given certain specified objectives.

The **past** is that part of time that has already happened.

The **historic past** is that part of human time after writing was invented.

The **prehistoric past** is that part of human time before the invention of writing.

The **living past** is that part of human time which each one of us creates by living our lives.

Remains of human behavior are the things people left behind.

An **archaeological site** is any place, large or small, where there are remains of human behavior.

Things found at sites include portable artifacts, non-portable artifacts, byproduct materials, and ecofacts.

An **artifact** is anything that has been changed by people either by using it or shaping it for a purpose.

Portable means that an artifact can be moved and carried without changing it.

A **non-portable artifact** is sometimes called a **feature**. It cannot be moved without destroying it or taking it apart.

Byproduct materials are remains such as trash or scratch marks that are created when people make or use artifacts.

Ecofacts are sources of evidence about the past natural environment.

Context is the environment of time, space, and culture within which sites and things found at sites are located.

Culture-history is the study of past cultures in time and space where archaeologists ask the questions: who were the people, when did they live, where did they live, and what characteristics define their culture?

Lifeways are the day-to-day, year-to-year, season-to-season, and month-to-month patterns of activities of people.

The study of **cultural change** describes and explains why a culture has changed.

Archaeologists who study **how people thought** in the past try to understand the symbols people used, what they believed about their world, and how men and women interacted in the culture.

Systematically means that there is a carefully developed plan with which to study the past.

Research design is the name that archaeologists and other scientists give to the plan which guides their research.

Lesson Plan #3

Title of Lesson: Meet an Archaeologist

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social studies, anthropology, career development

Skills Addressed: Reading comprehension, writing, cooperation, and pattern recognition

Main Concept(s): Archaeologists come from many backgrounds, hold a variety of jobs, and have many interests.

Objective(s): Students will learn about the interests, education, and jobs that involve archaeologists.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies - II.d.
Grade 5 Social Studies - II.d.
Grade 6 Social Studies - II.d.

Pennsylvania Department of Education (PDE):

Grade 7 History - 8.1.9 A - C
Grade 8 History - 8.2.9 B and C

Materials/Equipment:

*Student Text: "Meet an Archaeologist" (Chapter 3)
*Blackboard, whiteboard, and/or overhead projector
*Blank transparency, dry erase marker, and or chalk
*Internet access and computers for each cooperative group (optional)
*Drawing paper and drawing tools for each student
*Poster sheets and crayons/or magic markers (one set for each cooperative group)
*Materials for writing short essays (for each student)
*Pennsylvania Archaeological Council's Speakers' List (Appendix B) (optional)
*Guest lecturer - practicing archaeologist (optional)

Anticipatory Set:

1. Have the students draw a picture of an archaeologist at work. **Alternative**: If students already drew a picture for lesson 2, return picture to each student.

2. Have the students share each other's pictures working in cooperative groups. Ask them to identify the following points suggested by the pictures: gender of the individual, activity, place, tools, clothes, etc.

3. Write the answers of each group on the board or overhead transparency.

4. Ask each group to write down three questions they would ask an archaeologist if one visited the class and write these on the board or overhead transparency.

5. Ask students, "What kind of training do you think an archaeologist needs before he or she can do archaeological work?"

6. Inform students that they will learn about actual archaeologists and their work. In fact, they will read about the archaeologists who created these lessons.

Procedure:

1. Divide students into cooperative groups (4-5 students per group).

2. Have students read the five interviews in their Student Text (Chapter 3), "Meet an Archaeologist."

- **Complete Student Text:**

Profile of an Archaeologist
Renata B. Wolynec, Ph. D.

Dr. Renata B. Wolynec lives in Edinboro, Pennsylvania. She teaches at Edinboro University of Pennsylvania (as Professor of Anthropology and Archaeology) and directs the Fort LeBoeuf Museum in Waterford, Pennsylvania. She has a B. A. and M. A. in Anthropology from State University of New York at Buffalo and a Ph. D. in Anthropology from Northwestern University in Evanston, Illinois. She lives with her husband, two cats, one dog, a flock of turkeys, a herd of deer, two foxes, and a very big snake (under the back porch). She loves to talk to her daughter on the telephone, in her spare time.

How did you become interested in archaeology?

When I was in high school, I did not like archaeology. I could not imagine anyone having a steady job doing what archaeologists did. I also didn't like bugs, snakes, and dirt. For some reason, every movie I ever saw always showed bugs and snakes at archaeological sites. Of course, I had never talked to an archaeologist nor had I ever visited a real archaeological site. My inner city school did not provide us with opportunities to learn about such things. When I went to college, I started my studies in engineering. During my second year, I took an archaeology class. This was absolutely the most interesting, wonderful, and awesome course I had ever taken. I immediately decided to change my major because I was sure that I was going to be very happy

studying archaeology and anthropology. I did eventually learn to catch scorpions at our excavations in Mexico. However, I still didn't know if I could get a job.

What kinds of archaeology jobs have you had?

As a university undergraduate student, I was involved in a number of projects in New York State and Mexico. Sometimes I worked at site excavations discovering new information. Other times, I worked in a lab where I washed, catalogued, and analyzed the remains we found.

In graduate school I was involved in more complicated research. While at Buffalo, I set up an obsidian hydration dating laboratory which allowed me to discover how old the obsidian (volcanic glass) tools we found in Mexico actually were. In Illinois, I analyzed over 1,000 archaeological features discovered at the Koster Site. These features included the remains of some of the oldest permanent houses ever found in North America. I was one of the first archaeologists in the country to use computers to analyze large databases. The oldest site I have worked at has remains over 16,000 years old. I someday hope to work on sites in Africa, which are over one million years old.

What are you doing today?

Today, part of my work involves teaching university students at Edinboro University of Pennsylvania about archaeology and anthropology. Another part of my archaeological work focuses on finding the location of a French fort, which was the site of George Washington's first mission at the age of 21 in 1753; discovering details of life at a Pennsylvania farm site from the 1800s; and recording information on tomb stones that are being destroyed by acid rain. I am also director of the Fort LeBoeuf Museum, which enables me to teach teachers and students about archaeology and colonial history in Pennsylvania (www.edinboro.edu/fortleboeuf/index.html).

What are your special interests?

My special interest has always been archaeological methodology. Methodology refers to the different ways archaeologists do their work: how they ask research questions or solve research problems; how they collect and study information about the past. For example, for many years, some archaeologists did not study archaeological features as carefully as they could. By inventing a new way of studying features, I was able to show that pit features can be a very important source of information about the past. Because my interest is in learning how archaeologists can improve the way they do their work, I am not tied to any part of the world. I have worked on archaeological projects in Mexico, Ukraine, Belize, Illinois, Pennsylvania, and New York. I have taken my students to study archaeology in England, Pakistan, and Morocco. Of course, wherever I am, I always work with people who are experts in the particular archaeological culture being studied.

I am now very interested in archaeology education and site protection. I spend much of my time working on projects such as this book. I want to teach students to value our past and to understand why it is important to save archaeological sites from destruction. Sometimes I teach teachers about archaeology so that they can share what they learn with their students. More recently, I have been teaching other archaeologists how to be good teachers. I also volunteer on public education projects such as Pennsylvania Archaeology Month, which is held in October every year.

You can learn more about Pennsylvania Archaeology Month at www.pennarchaeologymonth.org.

Are you glad you became an archaeologist?

For the past thirty-five years, I have had the most wonderful life because I became an archaeologist. I met my husband during an archaeological excavation. I have enjoyed the company of my daughter on excavations as well. I never get bored. There is always something

new for me to do and learn. I also know that I am doing something important. I am sharing what I know with others and helping them appreciate the importance of the past. I believe that the more people learn and know about the past, the more they will be willing to help protect archaeological sites from being destroyed. Saving the past is everyone's responsibility.

Profile of an Egyptologist
Ellen Dailey Bedell, Ph. D.

Dr. Ellen Dailey Bedell lives in Pittsburgh, Pennsylvania and teaches at The Ellis School, an independent all girls college preparatory school. She has a B. A. from Chatham College in Pittsburgh, Pennsylvania and an M. A. and Ph. D. in Mediterranean Studies with a specialty in Egyptology from Brandeis University in Waltham, Massachusetts.

How did you become interested in Egyptology?

When I was in college I worked part-time at the Carnegie Museum of Natural History. My job was washing and cataloguing artifacts in a large room in the basement of the museum called Room 13. In my spare time I looked around at all of the wonderful things stored in the basement, including a mummy case covered with hieroglyphs. I became obsessed with the hieroglyphic text and decided I wanted to learn how to read this mysterious language.

What kinds of archaeology jobs have you had?

In graduate school, I specialized in reading ancient texts (philology) but I also studied archaeology. My husband and I spent our honeymoon excavating at Tell Ashdod in Israel. The most exciting thing we found was a bathtub filled with perfume bottles and amulets. In addition to the Middle East, I have worked on excavations in Central America and the United States.

What are you doing today?

Today, I enjoy teaching students about archaeology and encouraging them to value our cultural heritage. I once visited a Maya site where I saw a young boy steal a Maya glyph from an inscription in stone. He removed an important piece of the puzzle. His act would make it difficult or impossible for Mayanists to read the inscription. What was lost? We may never know. I want my students to become defenders of archaeological sites.

What are your special interests?

I am interested in teaching students how archaeology works and what they can learn from it. Recently I designed a web site to teach students about underwater archaeology and about interconnections in the ancient Mediterranean World. The students visiting the site explore a shipwreck with the aid of a diver who moves over the site map and they analyze artifacts and draw conclusions. This is a Late Bronze Age ship that sank off the coast of Turkey. If you want to explore the shipwreck yourself, visit the following web site www.TheEllisSchool.org/shipwreck .

Are you glad you became an Egyptologist?

Yes, Egyptology and archaeology continue to fascinate me. In the last few years I have taken alumnae, from the school where I teach, to Egypt and I have been able to share my knowledge of Egyptian culture with them. What a wonderful job to have!

Profile of an Archaeologist
Sarah Ward Neusius, Ph. D.

Dr. Sarah Ward Neusius is a Professor of Anthropology and Archaeology at Indiana University of Pennsylvania. She has a B. A. in Anthropology from Beloit College, Wisconsin and both an M. A. and a Ph. D. in Anthropology from Northwestern University in Evanston, Illinois. She lives in Indiana, Pennsylvania with her husband, who also is an archaeologist and professor. They have two children in college.

How did you become interested in archaeology?

I took my first anthropology course when I was a senior at a high school boarding school in New England, and I was hooked! At the time it was just a senior elective that fit my schedule, but I will never forget the impact of that course. Until then, I had not been a serious student though I did okay in school. Most of the standard coursework I had taken was a little boring to me; anthropology was anything but boring! It looked at people elsewhere in the world and over great periods of time, and in doing so, seemed to call into question the conventions of American society that, like most teenagers, I found a little frustrating. That term I was looking seriously at colleges, and a close friend, who happened to be from the Midwest, mentioned that Beloit College in Wisconsin had an excellent program in anthropology. I looked at Beloit, liked it, and went there to begin studying anthropology.

Initially, I thought that I was most interested in cultural anthropology, but like most anthropology departments in the United States, Beloit required its anthropology majors to take courses in physical anthropology, anthropological linguistics, and archaeology, as well as cultural anthropology. I found all of these courses more fascinating than anything I had had before, and I actually became a top student because of it! While in college I spent a term working as a research assistant in cultural anthropology on a project run by a research psychologist based in New York City. This term convinced me that archaeology actually was the part of anthropology that interested me the most though I did not then acquire any field experience in archaeology, and I couldn't quite figure out if I was most interested in Mesoamerican or North American archaeology.

I spent two years out of school before I started graduate school in archaeology, during which I explored the possibility of social work, and even worked as a tax auditor for the Internal Revenue Service. However, in 1974, I began graduate school in North American archaeology at Northwestern University. The biggest shock of graduate school was that almost immediately my professors wanted me to define what specifically I was interested in studying. For someone who loved all aspects of anthropology and had only gradually settled on North American archaeology, this was a pretty tough question! However, I did remember enjoying a particular research paper I had done in college on the relatively new interdisciplinary field of zooarchaeology, the study of animal bones from archaeological sites, so I told my professors I wanted to pursue this in graduate school. Amazingly, this turned out to be a good choice of specialization, both because my professors wanted a student to work with them on this aspect of projects they were doing, and because I found that I really loved to work with collections of animal bones. Bone identification work is a little like doing a big puzzle. Explaining what the results mean can challenge your ideas about how people use animal products.

What kinds of archaeology jobs have you had?

Before becoming a university professor, I did a number of jobs in archaeology. I worked as a zooarchaeologist attached to a university research center and was in charge of the zooarchaeological part of a major cultural resource management project in the U. S. Southwest. I taught part-time at several universities. I also held a post-doctoral fellowship and organized a conference on early human adaptations in the eastern United States. Finally, I served as a staff

archaeologist at a small archaeological museum, studying artifact collections, running excavations, and interpreting the archaeology for the public.

All of this experience, as well as my love of all types of anthropology, has helped me be a better university professor in a small anthropology department. I began my current job at Indiana University of Pennsylvania in 1986. Since then, I have taught courses in general anthropology, archaeology, zooarchaeology, and physical anthropology, as well as conducted research projects, advised students, and helped my department grow and improve its program for undergraduates. I have gotten involved with state historic preservation efforts, providing archaeological expertise by serving on the Pennsylvania Historic Preservation Board. I also have been fortunate to have been an officer and an active member in both state and national professional archaeological societies, which allowed me to be involved in all sorts of decisions affecting archaeology, and helped me gain insights into all sorts of archaeology.

What are you doing today?

My research at the moment is centered in central Western Pennsylvania, and on the period from A. D. 1,000 to European contact. In the immediate vicinity of Indiana, we know relatively less about this period than to the south of here, where the Monongahela culture is thought to characterize the period. With the help of my students, I am slowly investigating a series of sites in order to understand whether the people here should be considered Monongahela or perhaps some other cultural group.

What are your special interests?

Besides teaching and researching, I am most interested right now in writing about the work I have done both for professional and student audiences. My biggest, and in many ways most fun, activity these days is writing a textbook on North American archaeology. This is a huge project that will probably take another two years to complete, but if you continue to study archaeology maybe you will read my textbook someday!

Are you glad you became an archaeologist?

As I hope you can tell, I think I have a wonderfully interesting job and career that allows me to do many different types of things within archaeology. Although I am still interested in all types of anthropology, I can't imagine being anything but an archaeologist. As I write this, several of my students, my husband and I have just returned from a two and a half week trip visiting mound and earthwork sites all over the eastern United States. We met and talked with dozens of archaeologists, saw many cool sites and artifact collections, and visited all sorts of archaeological museums. To me all of this somehow made camping in the rain seem worth it. It was fun to see my students learning about North America's past, and it was even more fun for me to experience the sites and museums myself. In short, I'm still hooked on archaeology and anthropology after more than thirty years!

Profile of an Archaeologist
Joseph Baker

Mr. Joseph Baker lives and works in Central Pennsylvania, where he grew up. He has a B. A. in Anthropology from Penn State University and an M. A. in Anthropology from the University of Montana.

How did you become interested in archaeology?

My interest in archaeology sprang from two places. When I was a teenager, I worked on a farm along the Susquehanna River, and from time to time, I used to find stone tools and pottery in the fields while I was picking tomatoes. My discoveries made me very curious about the people who

left these things behind. At about the same time, I was placed in a history class taught by a fabulous and inspiring teacher named Tom Nissley. Mr. Nissley was the first teacher I ever had who really challenged his students to debate and re-think history. He made the past come very close to the present, and I've never forgotten him or the lessons he taught me.

What kinds of archaeology jobs have you had?
Since 1979, I have worked for a variety of public agencies testing, excavating, studying, and managing archaeological sites that were in the path of large projects like roads, dams, or timber sales. Over the years I've worked for the US Forest Service, the Bureau of Land Management, the National Park Service, the Pennsylvania Historical and Museum Commission, and most recently, the Pennsylvania Department of Transportation. That work has taken me from Montana and Wyoming back to my home state of Pennsylvania with a few stops in between.

What are you doing today?

Today, I am producing publications, training, and developing workshops in archaeology for the Pennsylvania Department of Transportation. I manage their historic preservation website (www.penndotcrm.org) which has quite a few resources for young people. I also do volunteer work for the Appalachian National Scenic Trail, helping to evaluate and manage a Civil War battlefield on the Trail in Maryland (www.iuparchaeology.iup.edu/FoxGap/).

What are your special interests?

I have several. I am interested in how prehistoric people used plants (it's called paleoethnobotany). I actually minored in botany in graduate school. I have dug several battlefield sites, so I have an interest in military archaeology. Most importantly, I'm an author and editor, and I enjoy writing for and educating the public.

Are you glad you became an archaeologist?

There is no better job!

Profile of an Archaeologist
Beverly M. Chiarulli, Ph. D.

Dr. Beverly Chiarulli lives in Pittsburgh, Pennsylvania and is Director of an Archaeological Research Center at Indiana University of Pennsylvania (IUP). She also teaches classes at IUP in anthropology and archaeology. She has a B. A. degree from the University of Illinois in Champaign, Illinois and a M. A. and Ph. D. from Southern Methodist University (SMU) in Dallas, Texas.

How did you become interested in archaeology?

Even when I was in elementary school, I was interested in books and television shows about ancient civilizations and human ancestors. The Leakeys were featured in National Geographic books and television shows and I thought the work they were doing in Africa was exciting and fascinating. When I was in high school, I developed other interests and went to college planning to major in Journalism. I took a class in anthropology and discovered that I could major in this field and so decided to change my major to anthropology. At first, I was interested in physical anthropology and wanted to study monkeys in Central America. I went to my university's archaeological field school at Cahokia Mounds in Illinois, near St. Louis, and found that archaeology was exciting. We were excavating in a large pit that had been created over a thousand years ago when the people who lived at the site used the soil to build a large temple mound. Through time, the pit was filled with trash - broken ceramics, deer bones, corn cobs, and stone tools - which gave us a glimpse into the past.

I decided archaeology was a more practical choice for a career. I changed my focus and decided to go to graduate school. When I was in graduate school in Texas, I had the opportunity to work on archaeological projects there that investigated archaeological sites that were going to be destroyed by the construction of reservoirs, and work on a Maya site in Belize. I did my dissertation research on the stone tools from the Maya site.

What kinds of archaeology jobs have you had?

I have had a lot of archaeology jobs. I worked in graduate school for an archaeological research center that was part of the SMU Anthropology Department. After I left SMU, I moved to Pennsylvania and worked as an archaeologist for a company that designs bridges and roads and does environmental studies. Archaeologists are often needed to find and investigate sites that may be destroyed by new construction projects. These studies are required by federal and state laws. I then worked for another company that was hired by the Pennsylvania Department of Transportation to help with the construction of Interstate 279 through Pittsburgh, again on the archaeological sites, like the Pennsylvania Canal and a historic cemetery that were in the path of the highway. Next, I worked for the Pennsylvania Bureau for Historic Preservation, part of the Pennsylvania Historical and Museum Commission, as a regional archaeologist in the western part of Pennsylvania. My job was to find new sites that might be destroyed by strip mines and also to develop educational programs on archaeology. Six years ago, I changed jobs and came to IUP to direct Archaeological Services, our archaeological research center.

Even though my jobs have been in Pennsylvania and I have worked on Pennsylvania archaeological sites for the past 20 years, I have still continued to be part of archaeological projects in Belize. I go down every year and either work at the sites of Maax Na, Chau Hiix, or Cerros. This spring, I went to Chau Hiix near the village of Crooked Tree, in central Belize, where I studied all the stone tools that were found this year.

What are you doing today?

Today, I am driving down to Fort Necessity, a National Park in Fayette County, to meet with the staff and plan some archaeological investigations that we may do next year.

What are your special interests?

My special interests are stone tools, the use of technology to find archaeological sites without excavation, Late Prehistoric sites in Pennsylvania, and the Maya.

Are you glad you became an archaeologist?

Yes, I am glad I am an archaeologist. I have had the chance to work with really interesting people in many parts of the United States and Belize. Archaeology gives a way to touch the past. Every day, I study artifacts that haven't been seen or touched since they were lost by the people who made them hundreds or thousands of years ago.

For more information on the archaeological sites we investigate at IUP, visit our web site http://www.iuparchaeology.iup.edu/default.htm.

3. Tell each group to identify how the archaeologists are the same and how they are different.

4. Have each group make a chart or conceptual web showing the similarities and differences. The chart or conceptual web can include gender, education, place of work today, past work experience, tools, and special interests, among other choices.

Closure:

1. Tell students to compare their answers on the chart with their drawings.

2. Ask students to discuss how their ideas of "what an archaeologist is" have changed after reading the profiles.

3. **Optional**: Invite an archaeologist from the speakers list (Appendix B), a local university, or museum to class. Have the students interview the archaeologist using the questions they previously developed.

> **Note**: It is not a good idea for students to send E-mail to an archaeologist to ask the questions. The archaeologists will probably not answer because they are too busy.

Assignment:

1. Divide students into cooperative groups (4-5 students per group).

2. Have students access, read, and discuss "Frequently Asked Questions About a Career in Archaeology in the U. S." www.museum.state.il.us/ismdepts/anthro/dlcfaq.html.

- **Option 1**: Have each group make a poster focusing on archaeology as a career.

- **Option 2**: Have each student write a short essay discussing archaeology as a career.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion.

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion: Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of

relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

www.museum.state.il.us/ismdepts/anthro/dlcfaq.html. Frequently Asked Questions About a Career in Archaeology in the U. S.

www.saa.org Society for American Archaeology

Renfrew, Colin and Paul Bahn. *Archaeology: Theories, Methods, and Practice*, 3rd edition. Thames & Hudson, 2000.

Local university Anthropology Department or contract archaeology company

Lesson Plan #4

Title of Lesson: How Do Archaeologists Do Their Work?

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social studies and science

Skills Addressed: Reading comprehension, writing, critical thinking, and mapping

Main Concept(s): Archaeological research involves a carefully developed plan of research called a research design.

Objective(s): Students will learn the parts of a research design and how they guide archaeological work

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies - II.d.
Grade 5 Social Studies - II.d.
Grade 6 Social Studies - II.d.

Pennsylvania Department of Education (PDE):

Grade 7 History - 8.1.9 A
Grade 8 History - 8.2.9 B

Materials/Equipment:

*Student Text: "How Do Archaeologists Do Their Work?" (Chapter 4)
*Blackboard, whiteboard, and/or overhead projector
*Blank transparency, dry erase marker, and/or chalk
*Research design transparency
*Site grid transparency
*Broken pottery transparency
*One penny for every student
*Writing paper and writing and drawing tools (for each student)
*Ruler (for each student)
*Visiting archaeologist (optional)

Anticipatory Set:

1. Tell students that they will be learning about how archaeologists plan and do their research.

2. Ask students, "How do archaeologists do their research, that is, find evidence of human behavior?"

> **Note**: Expect answers such as digging (possibly most common), library research, radar, aerial photography, picking things from the surface, etc.

3. Go around the room and ask each student. Allow each student a chance to respond.

4. As the students respond, write these words on the board or overhead transparency.

5. Tell students that archaeologists plan their work by developing a research design.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) This can be done through silent reading, choral reading, or you can read it with them. The assigned readings are included for your reference. Each of the following sections will indicate the necessary student readings, and a focus question to facilitate discussion and information that you, the teacher, will use to clarify and elaborate on the reading material. You may want to get some Cooperative Groups working together as the students become familiar with the concepts and terminology.

1. Student Text # 1:

> Almost everyone knows that archaeologists excavate archaeological sites. What most people do not know is that excavation is only a small part of the toolkit which archaeologists can use in doing their research. You may be surprised to learn that some archaeologists never excavate a site at all, yet they still do important archaeological research. In Chapter 2 of this book, we learned that archaeologists study the past **systematically**. This means that their research is guided by a plan called a **research design**. Every research design has four important parts. By exploring these parts in more detail, we will learn how archaeologists do their work.

- Show the students the different steps in a research design from the overhead transparency or write them on the board and read them to the class.

2. Student Text #2:

> The first step in doing archaeological research is to identify the research question or problem. A necessary part of asking the research question is to discover what has already been learned about the subject. In other words, the archaeologist is trying to identify what he or she hopes to learn that has not been learned before. Research questions may be about individual sites or groups of sites. Other questions may focus on a region of Pennsylvania such as a particular river valley.
>
> In Pennsylvania, archaeologists ask many important questions. Who were the first people to come to Pennsylvania? How did a particular culture interact with its environment? What is the earliest

evidence of farming? How long did people live in a particular part of Pennsylvania? What was the life of coal miners like in central Pennsylvania? Sometimes, the questions are simpler. How big is the site? How old is the site? What are the boundaries of the site? How many sites are there in a particular part of Pennsylvania? There are probably more research questions than archaeologists can ever hope to answer in Pennsylvania.

Some archaeologists ask new questions about the past. Others look at old questions in light of new discoveries and new techniques. Some archaeologists try to answer questions about past behaviors by trying to reproduce these behaviors. These experimental archaeologists try to make and use the tools and features to discover more about the actual processes of manufacture and use.

- Ask students, "What would you like to learn about past cultures in Pennsylvania or other parts of the world?"

Note: Go around the room giving each student a chance to answer.

- Tell students that archaeologists are asking most of these questions and trying to answer many of them. Once they have identified their research question, archaeologists go to the second step in creating their research plan or research design.

3. Student Text #3.

The second step in developing the research design is to identify the best way to answer the question. First, the archaeologist must decide which remains of human behavior and environment they need to answer their question. For example, if they want to study how pottery was manufactured, they will look for sources of clay, pottery remains, the tools used to make pottery, and the features that were used in their manufacture, such as kilns. Archaeologists must always remember not to destroy other sources of data. Other archaeologists may need them for their research.

Next, archaeologists need to determine how and where they will find and collect the evidence they need. They may either find new evidence through survey and excavation, or they will study the remains found by other archaeologists. Universities, historical societies, and museums contain archaeological materials, which others can study. Some archaeologists may use different forms of radar and sub-surface detectors, which look below ground for remains of human behavior without disturbing the soil of a site.

Archaeologists find sites by looking for them. They may find them by looking at the records kept by the Bureau for Historic Preservation in Harrisburg, talking to landowners, looking at old records such as diaries and maps, reading archaeological reports, and actually walking the land (called a field survey). When walking the land, archaeologists look for evidence of human behavior such as trash, tools, stains on the surface of the ground, fallen foundations, depressions, mounds, and more. Sometimes they see something unusual such as a big pile (a mound) in a flat area or unusually healthy or unhealthy plant life.

If they plan to do a field survey, archaeologists must find a way of recording their discoveries. Making maps showing feature, artifact, and byproduct material remains is a common way to record what the surveyors find. Archaeologists should not pick up what they find and take it away unless they have recorded and labeled everything they remove.

The sites are then officially recorded in Harrisburg where they receive their own label. The Fort LeBoeuf Site in Waterford, PA has the label 36ER65. 36 stands for the state of Pennsylvania; ER stands for Erie County; and 65 means that it was the 65th site recorded in this system, in Erie County, PA.

Of course, archaeologists should never survey or excavate any land without the landowner's written permission. If they don't get permission, they are breaking the law. This is true for state and federal land as well. No one is allowed to remove any cultural material from state and national parks and forests, museum grounds, waterways, or game lands without permission.

- Tell the students that 36ER200 is the registration number for the Battles Farmstead in Girard, PA.

- Ask the students, "What do these symbols and letters mean?"

Note: 36 means Pennsylvania; ER means Erie County, PA; and 200 means that it is the 200th site recorded in this system in Erie County, PA.

4. Student Text #4:

If archaeologists plan to excavate to recover new data, they must carefully plan every part of the excavation. They must organize the site excavation in such a way that context is preserved and recorded.

Usually archaeologists start by placing a grid of squares over the entire site. They build this grid from a reference point called a datum. The squares are usually one or two meters on each side. Every corner of every square is measured exactly using a tool called a transit. Wooden stakes or metal rods are placed at each corner and then connected with strings. Each square is given a label. This label is usually the distance and direction of the southwest corner of the square from the datum. For example, 2S4W means that the southwest corner of the square is two meters to the south and four meters to the west of the datum. Each square is then excavated in small layers called excavation levels.

Notes and maps are kept for every level. Artifacts, byproduct materials, and ecofacts are measured, exactly where they are found. All are labeled and collected by site number, square label, level number, exact location, date, excavator initials, and other relevant information. It is important that excavators peal away the soil so as not to disturb the remains. Excavators must always have a "tag and a bag" ready before they remove the item. Everything must be mapped exactly before removal to the bag. All features must be measured and drawn on the map. Photographs are taken. All of the dirt that has been excavated is carefully screened to discover additional remains missed by excavators. These sifted materials are also labeled by site, square, level, etc. Without these techniques, archaeologists will loose important information about context. Remember, without context, archaeologists cannot understand what they have found.

You may be surprised to learn that every excavation destroys archaeological evidence. You cannot put things back the way you found them. Therefore, it is most important that every archaeologist find a way of recording what is found in order to preserve information about the site and its contents. If a site is recorded well, then another archaeologist, who has never worked at the site, should be able to understand exactly what happened and be able to analyze the remains.

- Show students a site grid on the overhead transparency and review how the squares are labeled.

Note: You can draw a grid of many squares and ask each student to come up to the board to identify the square label. Guide the students in their deliberations. First, review the four directions on the map, the scale, and the location of the grid datum. Second, let each student find the southwest corner of the square under consideration. Next, ask each student to identify the

distance and direction, either north or south, then the distance and direction, either east or west of the southwest corner of the square from the datum.

- Show students the grid on an artifact distribution transparency.

- Ask the students, "Do you see any patterns in the location of the pottery?"

  Note: Have them use the square labels to identify the locations. Students should identify a concentration and scatter of broken pottery.

- Ask students "What might you conclude from the concentration of broken pottery?"

  Note: Students might conclude that a pot broke in that location. They could test this hypothesis by seeing if the pottery pieces have the same design or fit together.

5. Student Text #5:

If archaeologists are finding new evidence, they will have to determine the best way of protecting and preserving these remains. For example, remains that have been submerged in water or swamps are especially fragile. In some Pennsylvania lakes, piles of woolly mammoth bones have been found under water. The water, darkness, and cold temperatures have protected them from decay for 14,000 years. If we were to pick them up out of the water, they would start to dry right away. Some bones would dry so quickly that they would fall to pieces in our hands. Others would take a little longer to crack and break apart. Any evidence of cut marks resulting from cutting away meat from the bone would be lost. Not only must the archaeologist anticipate the need to protect the remains during recovery, special steps must be taken to preserve the remains, such as these bones, in the laboratory.

All will have to choose the kinds of tools they will use. Archaeologists use tools ranging from mason's trowels, measuring tapes, sifters, and spoons, to satellites and nuclear reactors in discovering evidence about the past. Because so much archaeological work requires special knowledge, they will have to assemble a team to help them find and study the remains. It is not unusual for a botanist, zoologist, geologist, chemist, computer programmer, or physicist to be part of an archaeological project.

Archaeologists will have to pay special attention to recording the evidence which they find and study. Specially prepared field notes, careful measurements, maps, photographs, computer databases, and satellite images may be part of the recording process.

An archaeologist must consider all of these questions before data collection and study actually takes place. Archaeological data may be destroyed if this step is ignored.

- Tell the students that the research question will help determine the kinds of evidence to be collected.

- Tell students, “You are archaeologists whose research problem is to identify the diet of people who lived at a particular site. This means that you are asking at least two questions. 'What did the people eat?' 'What was the nutritional quality of the food?'”

- Ask students, “What kinds of evidence would you collect to learn about diet?”

Note: Expect answers such as plant and animal remains, bones, seeds, cooking tools, eating tools, food collecting tools such as arrow points and baskets, art, plant and animal impressions on pottery, chemical residues in pots, burned on food remains, human feces, etc. If students have trouble answering this questions, share these with them.

- Ask students, "What kinds of special scientists would an archaeologist include on the team if the research question involved diet?"

Note: Expect answers such as botanists, zoologists, palynologists (pollen specialists), nutritionists, chemists, etc.

- Ask students, "What tools would you use to find information about diet."

Note: Probably the most common answer will be that archaeologists will excavate or dig-up the evidence using digging tools such as shovels, trowels, spoons, and knives.

- Ask students, "How will you discover plant and animal remains as small as strawberry seeds and sardine bones?"

- Tell students that many food remains are very tiny. Seeds, tiny bones, and fish scales may be almost invisible in the soil. An archaeologist would use a technique called flotation to find as much plant and animal materials as he or she can. This technique is simple. Archaeologists put a metal tub, with a screen on its bottom, into a source of water. They then pour samples of soil into the tub water. The loose soil washes through the screen at the bottom. The plant and animal remains float to the surface of the water to be skimmed off with a tea strainer. The plant remains are sent to the botanist on the team, while the animal remains are sent to the zoologist on the team for analysis.

- Ask students, "What other questions about the life of these people could you ask?"

Note: Expect answers such as how people interacted with their environments, how much they moved to get their food, their level of hunting and collecting skills, whether or not they traded with others for food, what was their religion, etc.

6. Student Text 6:

The third step in a research design is to plan how the collected remains will be preserved and studied, where they will be studied, and more. Once again, the archaeologist must consider such matters as preservation, recording, and special knowledge.

The laboratory where the analysis takes place should have enough storage space for the archaeological remains. If some remains are fragile, special steps must be taken to keep them from falling apart.

Textiles must be preserved as should objects of metal. All organic materials must be protected from further decay. All field records including notes, maps, photographs, and field tags must be protected from mold, decay, and chemical disintegration. Archaeologists do not study things and then throw them away. They must take steps to preserve these remains for future archaeologists to study.

In the laboratory, remains of human behavior are prepared for analysis by cleaning, preserving, and cataloguing. Cataloguing involves numbering, measuring, weighing, and describing the object. These descriptions and numbers can be stored in card files or in computer databases. The remains are then studied by specialists using whatever tools they need to answer the research questions. Common tools for analysis include computers, cameras, microscopes, drawing tools, statistics, and measuring devices. Some laboratories are highly specialized. They are used for only one purpose such as determining a Carbon-14 date or studying plant pollens.

- Distribute one penny to each student.
- Tell the students to describe the penny in writing.
- Tell the students to draw both sides of the penny.

Note: Student descriptions should include the specific design on both faces of the coin (there is a miniature Abraham Lincoln inside the Lincoln memorial, although it is difficult to recognize), the material (copper), condition, dimensions (thickness and diameter), and weight (if a scale is available). Some students will say that it is Abraham Lincoln's profile. That is part of the description as well as an interpretation. If the students were from another part of the world, they would not know it is Lincoln.

7. Student Text 7:

The final part of the research design is to write a report about the work so that other archaeologists can learn from it. If an archaeologist does not write a report and does not share the analysis or conclusions, he or she has destroyed archaeological evidence and is no better than a treasure hunter.

Throughout this decision making process, the archaeologist is always aware that a bad decision may result in the destruction of archaeological remains, especially archaeological context. It is context that gives meaning to the evidence that archaeologists find. You cannot answer the questions about who, when, where, and what without collecting evidence of context (see Chapter 2).

Once the research design is completed, the archaeologist can work hard to make the project "come alive." The research design is an important guide for doing archaeological work. Sometimes, an archaeologist may have to change some parts of the plan as evidence is collected and analyzed. However, by following and changing the plan as needed, an archaeologist can be sure that he or she has tried to do his or her best in answering an important research question.

- Show the students the different steps in a research design from the overhead transparency or write them on the board and review them with the class.

Closure:

1. Ask the students, "What have you learned about how archaeologists do their work?"

Note: Let the students consider how they feel about archaeological work and whether it takes training in the form of education to do archaeological work.

2. **Optional**: Invite a professional archaeologist to class to discuss how they plan their work.

Assignment:

1. Divide students into cooperative groups (4-5 students per group).

2. Tell the students, "Let's pretend that each group is a team of archaeologists. You have learned that there is a fort site near your school."

3. Tell each group to develop a research design to learn more about this site.

> **Note:** Distribute a copy of the transparency showing the four parts of the research design to each group for reference or post it where everyone can see it.

4. Each group can prepare a written report or develop a chart to show their research design.

> **Note:** Students should follow the research design step-by-step. They can do additional research about archaeological methods on the Internet or at the library. If they start digging right away, they have missed the point entirely.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials can be assembled in a student/group portfolio. Compare the discussion generated in the "Anticipatory Set" with the discussion in "Closure." Success of the lesson can be ascertained by an improved quality of the discussion and in "Closure."

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the

hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

www.saa.org Society for American

Renfrew, Colin and Paul Bahn. *Archaeology: Theories, Methods, and Practice*, 3rd edition. Thames & Hudson, 2000.

Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades*. United States Department of the Interior, Bureau of Land Management, 1993.

Local university anthropology department or contract archaeology company

Transparency – four steps in a research design

Four Steps in an Archaeological Research Design

1. Identify the research problem or question.

2. Identify the data recovery methods.

3. Identify how the data will be processed and analyzed.

4. Identify how the results will be presented and shared with others.

Transparency – site grid

	6N4W	6N2W	6N0E	6N2E	6N4E	6N6E	6N8E
	4N4W	4N2W	4N0E	4N2E	4N4E	4N6E	4N8E
	2N4W	2N2W	2N0E	2N2E	2N4E	2N6E	2N8E
	0N4W	0N2W	0N0E	0N2E	0N4E	0N6E	0N8E
	2S4W	2S2W	2S0E	2S2E	2S4E	2S6E	2S8E
	4S4W	4S2W	4S0E	4S2E	4S4E	4S6E	4S8E
	6S4W	6S2W	6S0E	6S2E	6S4E	6S6E	6S8E
	8S4W	8S2W	8S0E	8S2E	8S4E	8S6E	8S8E

DATUM = SW corner of square 0N0E
DISTANCE = two meters

Transparency – site grid with broken pottery

	6N4W	6N2W	6N0E	6N2E	6N4E	**X** 6N6E	6N8E
	4N4W	4N2W	4N0E	4N2E	4N4E	4N6E	4N8E
	2N4W	**x** **x** **xxx** 2N2W	**x** 2N0E	**x** 2N2E	2N4E	2N6E	2N8E
	X 0N4W	**xxxx** **x xxxx x** **xxxxxxxx** 0N2W **xxx**	**x x** **x x xxx** **xxxxxxx** 0N0E **xxx**	0N2E	**x** 0N4E	0N6E	0N8E
	xxxx **x** 2S4W	**xxxxxxxx** **xxxxxxxx** **xxxxxxxx** **xxxxxx** 2S2W	**xxxxxxxx** **xxxxxxxx** **xxxxxx** **xxxxx** 2S0E	**x** **xxx** 2S2E	2S4E	**xx** 2S6E	2S8E
	Xx **Xxxx** 4S4W	**xxxxxxxx** **Xxxxxxxx** 4S2W	**xxxxxxxx** **xxxxxx** 4S0E	**xxxxxx** **xxxx** 4S2E	4S4E	4S6E	4S8E
	6S4W	**x** 6S2W	**xx** 6S0E	6S2E	6S4E	6S6E	**x** 6S8E
	8S4W	8S2W	8S0E	8S2E	**x** 8S4E	8S6E	8S8E

DATUM = SW corner of square 0N0E
DISTANCE = ——————
two meters

xxxxx = broken pottery (pot sherds)

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↑

Lesson Plan #5

Title of Lesson: How Old Is It?

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social studies and science (dating techniques)

Skills Addressed: Reading, verbal communication, critical thinking, research, and cooperation

Main Concept: Archaeologists use many ways to answer the important question "How old is it?"

Objective(s): Students will be able to identify major dating techniques used by archaeologists and learn how some of these techniques work.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies - II.d.
Grade 5 Social Studies - II.d.
Grade 6 Social Studies - II.d.

Pennsylvania Department of Education (PDE):

Grade 7 History - 8.1.9 A
Grade 8 History - 8.2.9 B

Materials/Equipment:

*Student Text: "How Old Is It?" (Chapter 5)
*Blackboard, whiteboard, and/or overhead projector
*Blank transparency, dry erase marker, and/or chalk
*Vocabulary transparency or individual student copies of vocabulary
*Stratigraphic profile transparency
*Stratigraphic profile exercise (one for each student or cooperative group)
*Any five thick books
*Pie chart transparency
*Sandwich transparency
*Tree cell growth and tree cross-section transparency
*Tree-ring skeleton graph transparency
*Dendrochronology exercise (one for each student)

*Poster board (one for each team of five students – assignment option 1)
*Materials for writing a short essay.
*Poster or drawing paper (for each team of five students – assignment option 2)
*Materials for writing a short essay (one for each student)
*Materials for writing a group report (one for each cooperative group)

Anticipatory Set:

1. Tell students that dating archaeological sites and the remains found at the sites is a very important part of archaeological analysis. When archaeologists date a site and the remains found at the site, they are asking the question "How old is it?"

2. Ask students "Why do you think archaeologists think this is an important question?"

> **Note**: This is a brainstorming session.

3. Write the answers on the blackboard, whiteboard, or overhead transparency.

4. Ask students "Do you know of any examples of the ways in which archaeologists answer this question?"

> **Note**: This is an opportunity for students to share what they already know with the class.

5. Write the answers on the board or overhead transparency.

6. Tell the students they will learn how some archaeological dating techniques work.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) This can be done through silent reading, choral reading, or you can read it with them. The assigned readings are included for your reference. Each of the following sections will indicate the necessary student readings, and a focus question to facilitate discussion and information that you, the teacher will use to clarify and elaborate on the reading material. You may want to get some Cooperative Groups working together as the students become familiar with the concepts and terminology.

1. Student Text #1:

> One of the most important questions, which archaeologists ask is, "How old is it?" When archaeologists study a site and things found there, they need to place what they find into the context of time. Therefore, "How old is it?" is one of the important questions, which archaeologists must answer if they are to understand the evidence they discover. Archaeologists use two different ways to date, or discover the age, of the remains they study: relative dating techniques and chronometric dating techniques. **Relative dating** techniques identify whether something is older than or younger than something else. These techniques cannot answer the question "When?" **Absolute dating** techniques allow the archaeologists to answer the question "When?" These techniques sometimes use "clocks" that exist in nature.

- Review the definitions of relative dating and chronometric dating from the vocabulary transparency.

2. Student Text #2:

> An important relative dating technique is called **stratigraphic dating**. This technique uses **stratigraphy** or the study of the layers of remains found at a site. All kinds of things can occur in layers. Soil, buildings, tools, pollen, bone, and trash are good examples of things that can be found in layers at a site. The important idea, which makes this technique possible, is that things that are at the bottom of a site are older than things on the top. Another way to say this is that the first layers to be deposited at a site are oldest, while the last layers to be deposited are the youngest. This is called the **Principle of Superposition**. This is not always true. Sometimes, people in the past dug so many holes into their campsites and villages, that they mixed-up the deeper and older remains with their own. However, this technique is useful most of the time. By itself, stratigraphic dating cannot tell us how old something actually is, or how much time has passed. It can only tell us whether something is older than something else.

- Review the definition of stratigraphic dating and Principle of Superposition from the vocabulary transparency.

- Make a pile of books by laying one book on top of the other on your desk.

- Ask students, "Which book came first, which came next, which came last."

> **Note:** This is a simple way of describing the Principle of Superposition and layering of remains. From oldest to youngest the order of the layers is as follows: A (oldest), B, C, D (youngest).

- Show simple stratigraphic profile on overhead projector.

- Ask students, "Which layer is the oldest; which came next; which is the youngest?"

- Point to the pit at the surface of the stratigraphic profile and ask students, "How can digging a pit at the surface change the layers at the site?" "How could this effect how archaeologists interpret the age of the materials?"

> **Note**: This is a simple brain storming session, which should give you some indication of whether or not the students have understood the concepts.

- Distribute the stratigraphic profile exercise to each student or to cooperative groups (4-5 students in each).

- Have students circle the letter representing a layer, in each group of two, which is the oldest of the two.

> **Note**: Review the definition of the Principle of Superposition before the students start the exercise.

- Ask students their answers and have them explain why they chose the layer that they did.

Note: Go around the room, asking each student or group to give an answer. The answer key is as follows: B is older than A; B is older than C; C is older than A; C is older than D; F is older than E; G is older than H. It is important to note that because a layer appears to be deeper than another layer, doesn't mean that it is older than a less deep layer. For example H is the bottom of a pit that was dug into layer G. H was dug below level G. However, G was already there when pit H was dug. Therefore, G is older.

3. Student Text #3:

Sometimes archaeologists can discover that some things are the same age. When two or more objects are found together in the same archaeological deposit, such as in a pit, it may be because they were buried at the same time. This is called dating by **association**. Archaeologists have to be very careful to show that the remains actually do belong together. For example, if pieces of wood charcoal are found together with pieces of burned deer bone and a fire-cracked spear point at the bottom of a pit feature, which has been covered with fire-cracked rocks and soil, archaeologists could conclude that these objects are from the same time period.

Sometimes archaeologists can date a site by comparing some remains to the environments they are found in. For example, if archaeologists find the bones of a woolly mammoth at a site in Crawford County, PA, they will probably conclude that this site may be an Ice Age site, because woolly mammoth did not live in Pennsylvania after the Ice Age was over. Sometimes they can compare chemicals that are found in bones, which have been discovered together, to determine if the bones are of the same or different time. For example, bones absorb fluorine and uranium from ground water. If the bones found in association have the same amount of fluorine and uranium, they are probably the same age. If they have different amounts, they were probably deposited at different times. This only works if the bones are found together.

- Review the definition of association from the vocabulary transparency.

- Ask students to list the objects in their desk drawers or backpacks.

- Tell students that these objects are found together at this time of their lives. If an archaeologist found their backpack as it exists today, they could be able to learn something about each of them.

- Ask students to discuss what they think archaeologists would learn about them from their backpacks and their contents. **Option**: Have each student write a short essay about what they think archaeologists would learn about them from their backpacks and their contents.

Note: Be careful when you do this. You do not want to embarrass students or invade their privacy. The option of writing an essay will allow students to think about the question while maintaining their privacy.

- Ask students, "If these objects were scattered all over the school, would archaeologists be able to discover something about you? Why not?"

4. Student Text #4:

> Cultural change is also useful in determining if something is older than or younger than something else. People often change the shape, raw material, ways of manufacturing, and decorations of things they use. When something is popular, more of it is used than if something is not popular. By studying many sites, archaeologists can discover the order in which certain remains such as tools and buildings have changed. The order of changes and their descriptions are called a **typology**. Archaeologists can use this information to identify where, in a sequence of change a site or object belongs.
>
> These and other relative dating techniques are useful for determining whether things are older than, younger than, or the same age as something else. They cannot give archaeologists actual calendar dates. To do this, we need to use chronometric techniques.

- Review the definition of typology from the vocabulary transparency.

- Ask students, "What objects, from your culture, have changed their appearance through time?"

> **Note:** Expect answers such as cars, houses, computers, action figures, dolls, etc.

- Tell students that if archaeologists of the future discover the order in which these objects changed, they will be able to use this information to discover which layers are older than or younger than other layers at a site.

5. Student Text #5:

> **Absolute dating** techniques are sometimes called **chronometric techniques.** They allow the archaeologists to answer the question "When?"
>
> Perhaps the most obvious dating tool is the calendar itself. A number of cultures in the past invented calendars. Because they kept track of time, archaeologists are able to find out when something happened. The coins in our pockets all have dates on them. These dates tell us when the coins were manufactured. European pioneers in North America may have lost a coin at a site we are exploring. The date will be useful in dating the coin. However, it may not help us date the historic site. If you look at the coins in your backpack or pocket, you will probably find coins with different dates on them. Sometimes people keep old things as souvenirs. If you look around your bedroom at home, you will find objects there from all the years of your life. An archaeologist looking at your room might be able to read a date on each object, but still not be sure when you lived in your room.
>
> Not all calendars measure time the same way. Not all calendars start in the same place. The Maya, Judaic, Chinese, Islamic, and Christian calendars are very different from each other. In the Christian calendar, it may be the year 2003 in April, while in the Islamic calendar it is the year 1424. Therefore, even though archaeologists may find a date from another culture's calendar, they still have the problem of figuring out how that date translates to the calendar they are using today.

- Review the definition of absolute dating techniques from the vocabulary transparency.

- Ask students, "What other problems might archaeologists encounter when they discover another culture's calendar?"

Note: Expect answers such as the language may be different, the writing system may be different, the year may not begin at the same time, the number of days in a year may be different, the number of months in a year may be different, the calendar may be based on the stages of the moon and not the sun, etc. If students find it difficult to answer this question, try to guide them by asking questions about each of these possibilities.

6. Student Text #6:

Some of the most useful ways of answering the question "When?" include clocks that are found in nature. The most useful of these radioactive clocks is **radiocarbon dating**. All plants and animals contain carbon-14. Plants and animals are called **organic remains**. This means that the element carbon is an important building block for plants and animals. When a plant or animal dies, a special kind of carbon called carbon-14 begins to change into something else. This kind of change of a radioactive material is called **decay**. Every 5730 years, one-half of the amount of carbon-14 in these organic remains decays. The time it takes for one-half of the carbon-14 to decay is called its **half-life**. By measuring the amount of carbon-14 left in a plant or animal, the archaeologist can determine when the plant or animal died.

- Review the definition of organic remains, decay, and half-life from the vocabulary transparency.

- Explain the meaning of half-life by using a pie graph. Use the transparency or draw the pie graph on the blackboard or whiteboard.

Note: Let's use a pie to explain how this works. It takes us 5730 years to eat one-half of the pie. We now have one-half of the pie left. It will take us another 5730 years to eat one-half of what is left. Now we have only one-quarter of the original pie left. It will take us another 5730 years to eat one-half of what is left, and so on.

- Tell students that archaeologists can date organic remains as old as 50,000 years using radiocarbon dating. If archaeologists find wood charcoal at the bottom of a pit feature, they can use radiocarbon dating to discover when the tree, which provided the wood, died. This will help date the pit and possibly the archaeological site.

7. Student Text # 7:

Other radioactive clocks are used to date rocks. Potassium-argon and fission-track dating are examples of dating techniques used to date rocks produced by volcanoes. These techniques are used to date very old sites. Archaeologists have to be very careful about the way they use these techniques. For example, a tool can be made from a rock that is two million years old. This does not mean that the tool is two million years old. The tool may have been made 10,000 years ago.

- Explain how this works using the analogy of a sandwich. Use the transparency or draw the "sandwich" on the board as you explain.

Note: Perhaps a sandwich will help us understand how a technique such as Potassium-argon is used. Radioactive isotope potassium-40 changes or decays to the gas argon-40. Its half-life is 1.3 billion years. That is, one-half of the amount of potassium-40 changes into the gas argon-40 every 1.3 billion years. Volcanic rocks contain a lot of potassium-40. Let us imagine that an exploding

volcano deposits a layer of volcanic ash in East Africa. By using potassium-argon dating we discover that this layer is 2.0 million years old. Once the ash cooled, people built a campsite on the surface for a few days and then left. The volcano exploded again, covering the campsite. By using potassium argon dating we discover that this layer is 1.9 million years old. Therefore, the campsite that is sandwiched in between the two volcanic layers is no older than 2.0 million years old, and no younger than 1.9 million years old.

8. Student Text #8:

One of the most reliable dating methods used by archaeologists is tree-ring dating. The special name for tree-ring dating is **dendrochronology**. This dating technique is very useful where people used wood for building and where this wood is still preserved. How does tree-ring dating work? Before we can answer this question, we have to learn where tree rings come from.

All of us have noticed that in the springtime trees grow very quickly. Overnight, we can see more and bigger leaves as the spring continues. Sometimes we are surprised at how quickly the leaves grow. At the same time the leaves are sprouting and growing, the tree trunk is getting thicker. This means that the tree is growing more wood, very quickly, in the springtime. By summer time, the tree is still growing, but very slowly. By the fall and winter, a tree stops growing. In the springtime, the tree starts growing very quickly again. If we were to look at the new wood, which has been grown during the year under a microscope, we would find that the cells grown in the spring are very big, while the summer cells are very small. In the winter, there are no new cells. Because the big spring cells are growing next to last year's slow summer cells, it looks as if there is a line in the wood.

If we looked at a cut in the tree, it would look as if the tree had grown rings of wood. Every year the tree grows rings on the outside, under the bark. By counting the number of rings, we can discover how old a tree is. Archaeologists can use this information to date sites in certain parts of the world.

- Review the definition of dendrochronology from the vocabulary transparency.

- Show students the transparency of yearly cell growth and tree-ring cross-section. The drawing of the cell growth is highlighted using a drawing of a magnifying lens.

Note: Point to the large cells, which represent spring growth. Point to the small cells which represent summer and fall growth. Point to the next spring's growth. Point to the boundary between the past fall's and spring's cells. This is where the ring appears.

- Point to the tree tree-ring section on the same transparency.

Note: Point to each ring and explain what happened in the life of the tree. The center circle is the first year of growth or the pith. The next year is the second year's growth, etc. The last ring nearest the bark is the final year's growth before the tree was cut down.

9. Student Text #9:

How much wood grows each year depends on how old a tree is and on the climate. An old tree will produce narrower rings than a younger tree. In dry climates, such as in New Mexico and Arizona, the amount of rainfall is different from year to year. If there is a lot of rain, the ring will be thicker. If there is little rain, then the ring will be narrower. Therefore, archaeologists can also use tree-rings to learn about the climate of people who lived in the past. Arizona archaeologists can identify when there was a drought and how long the drought occurred. A drought would

appear as several very narrow rings found together. In the temperate climate of Pennsylvania, sunshine and temperature will be more important in determining the size of a ring. If it is very cold in the spring, a tree will produce a narrower ring.

Archaeologists measure and plot the thickness of each ring on a diagram called a **skeleton graph**. Trees of the same species that grow in the same area, such as the Douglas Fir in Arizona, can be used to learn about the climate and date archaeological sites in the area. Before they can use the tree-rings for dating, archaeologists have to create a chart, called a **master chart**, which shows the whole pattern of changes in tree-ring thickness for the area. Because the climate can be different from region to region, a different master chart must be prepared for each region. They start by plotting the thickness of tree-rings of a living tree on a skeleton graph. Next, they find an older tree and do the same for that tree. They then match the thicknesses of the tree-rings to each other. They keep matching older and older tree-rings until they have a chart that shows the pattern of tree-rings for many hundred's and sometimes thousands of years into the past.

If archaeologists find wood showing tree-rings at an archaeological site, they can match the pattern of rings to the master chart and find out when the archaeological tree sample was cut down. They use this technique to determine when trees were cut down. They then use this information to discover when a site may have been occupied. They have to be very careful because people in the past often reused wood from older sites and buildings when they remodeled. Therefore, it is possible that an ancient house in New Mexico may have wood from trees which were cut fifty or more years apart. Even though dendrochronology is very accurate in dating the death of a tree or changes in climate, archaeologists still have to interpret what this evidence means when they are dating a site. Archaeologists are now trying to develop a master chart for certain kinds of oak trees in Pennsylvania. Even though they may be successful, it will still be difficult to use, because most very old wood in Pennsylvania has rotted away. Tree-ring dating is so accurate that it is used to check the accuracy of carbon-14 dating.

There are many other dating techniques which archaeologists are using today. There will be new techniques in the future. Archaeologists are always finding new ways of dating archaeological sites and things found at sites. They work together with chemists, physicists, geologists, and others to discover how we can use clocks found in nature to ask the question "How old is it?"

- Show the previous transparency of yearly cell growth and tree-ring cross-section.

- Explain how drought is indicated on the transparency of a tree-ring section.

Note: Show the rings, which are very close together. They can be found closer to the bark. In fact they are so close together that they are almost invisible. These rings indicate the time of a drought.

Note: Show some of the thickest rings. They can be found closer to the center of the tree. These rings represent the time when there was lots of water available to the tree.

- Show the transparency of a skeleton graph made of a tree-ring section.

- Identify the rings when there was little water. Identify the rings from a time when there was lots of water available to the tree.

Note: The lines, which are the shortest on the skeleton graph, are from a period of drought; the lines that are the tallest are from a period of plentiful water.

- Distribute the dendrochronology exercise to each student or to cooperative groups (4-5 students in each).

> **Note**: Have students identify the first year of life of the tree if it was cut down in 2003.
>
> **Note**: Have students identify the years when there was a drought.

- Ask students their answers and have them explain them.

> **Note**: Go around the room, asking each student or group to give an answer.

Closure:

- Ask students, "Why is the question, 'How old is it?' important to archaeologists?"

- Ask students, "If a site is disturbed in anyway, how can this effect the ability of archaeologists to date the site and the things found at the site?"

> **Note**: You can guide the discussion by reviewing the different ways a site can be disturbed (i.e. road building, a dam reservoir, housing development, treasure hunting, etc.). You can guide the discussion by reminding students of how important context is to archaeologists in understanding the remains of past human behavior (Chapter 2).

Assignment:

1. Divide students into cooperative groups (4-5 students per group).

2. **Option 1:**

- Tell each group to identify one group of objects they know from their culture that has changed through time.

> **Note**: Approve the categories in advance so that there are no duplications. Good examples would be specific kinds of cars such as Ford sedans, SUV's; toys such as GI Joe and Barbie; clothes; shoes, etc.

- Tell each group to create a chart showing the changes in the group of objects and when these changes took place.

- Display these charts in the room, so that other students can see what kinds of changes have taken place in the material remains of their culture.

3. **Option 2**:

- Tell each group to research one dating technique used by archaeologists, which has not been discussed in class.

Note: Approve the techniques in advance so that there are no duplications. Examples of dating techniques not discussed in class include: fission track dating, optical dating, thermoluminescence dating, electron spin resonance dating, obsidian hydration dating, amino-Acid racemization, cation-ratios and the dating of rock art, chlorine-36 dating, archaeomagnetic dating.

- Have each group prepare a written and oral report describing how each technique is used, why it works, and what its limitations are.

- Place each report in the classroom library.

4. **Option 3:**

- Tell each group to research one calendar other than their own which is used by someone in the world today.

- Have each group prepare a chart, along with a written and oral report describing how where, and by whom each calendar is used.

- Display these charts in the room, so that other students can learn from them.

Note: Approve the calendars in advance so that there are no duplications. Let each group discover what the different types of calendars are on their own. The Islamic, Mayan, Judaic, and Chinese calendars were mentioned in the text.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials can be assembled in a student/group portfolio. A vocabulary list and content terminology can also be assessed through objective means.

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands.

Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

Rapp Jr., George, Susan Mulholland, John Gifford, and Stanley Aschenbrenner. *Laboratory Exercises for Introduction to Archaeology*. University of Minnesota, 1984.

Renfrew, Colin and Paul Bahn. *Archaeology: Theories, Methods, and Practice*, 3rd edition. Thames & Hudson, 2000.

Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades*. United States Department of the Interior, Bureau of Land Management, 1993.

Transparency - Vocabulary

Lesson 5 - Vocabulary

Relative dating techniques identify whether something is older than or younger than something else. These techniques cannot answer the question "When?"

Chronometric dating techniques allow the archaeologists to answer the question "When?" These techniques often use "clocks" that exist in nature.

Stratigraphic dating uses **stratigraphy** or the study of the layers of remains found at a site to date the site.

The **Principle of Superposition** states that things that are at the bottom of a site are older than things on the top. Another way to say this is that the first layers to be deposited at a site are oldest, while the last layers to be deposited are the youngest.

When two or more objects are found together, in the same archaeological deposit such as in a pit, it may be because they were buried at the same time. This is called dating by **association**.

When something is popular, more of it is used than if something is not popular. By studying many sites, archaeologists can discover the order in which certain remains such as tools and buildings have changed. The order of changes and the descriptions are called a **typology**.

Chronometric techniques are sometimes called **absolute dating techniques.** They allow the archaeologists to answer the question "When?"

Carbon-14 dating (or **radiocarbon dating**) is an absolute dating method that measures the decay of the radioactive isotope of carbon (Carbon-14) in organic material.

The element carbon is an important building block for plants and animals, which are called **organic remains**.

A **half-life** is the time taken for half the quantity of a radioactive isotope in a sample to decay.

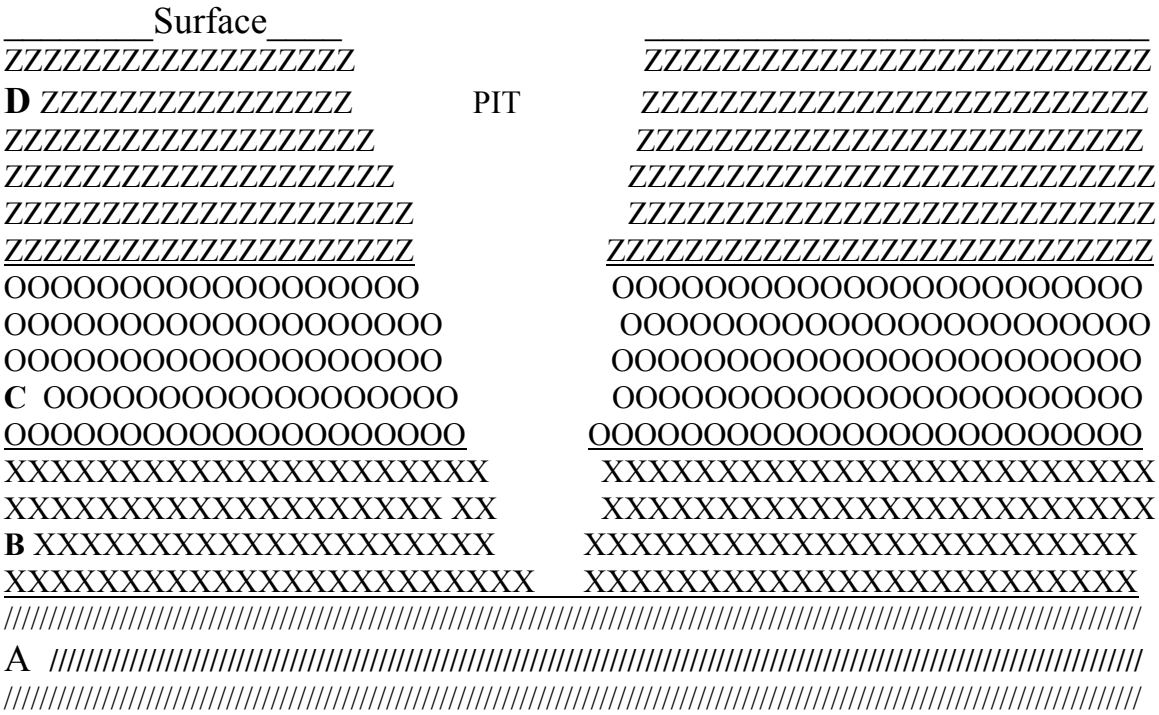
Decay is what we call the change when one radioactive isotope in a sample changes into another.

Dendrochronology is the name for tree-ring dating.

A **skeleton graph** is a diagram, which shows the thickness of each ring on a tree.

A **master chart** shows the whole pattern of changes in tree-ring thickness in an area.

Transparency – Simple Stratigraphic Profile



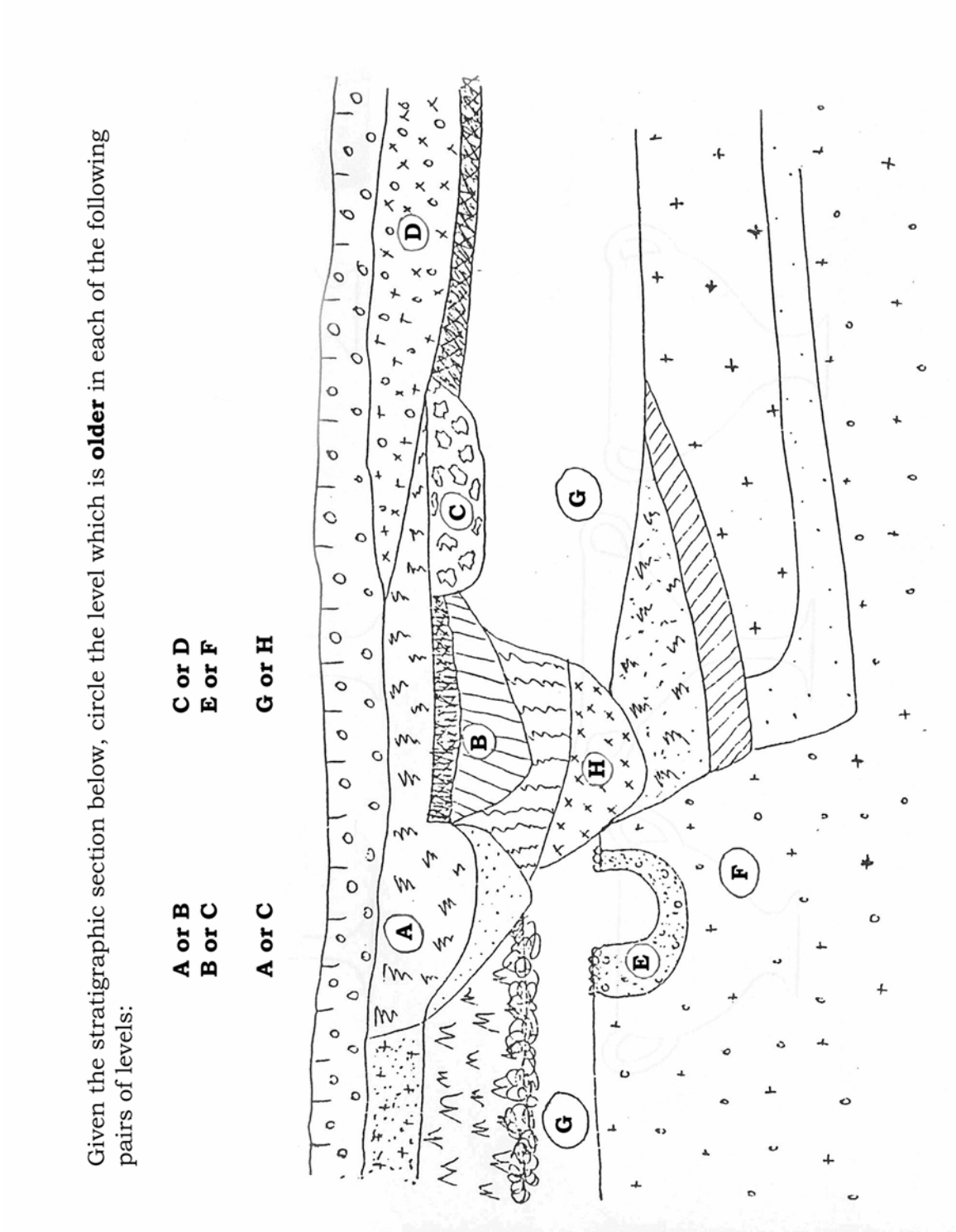
Stratigraphic Profile – Student Exercise

Given the stratigraphic section below, circle the level which is **older** in each of the following pairs of levels:

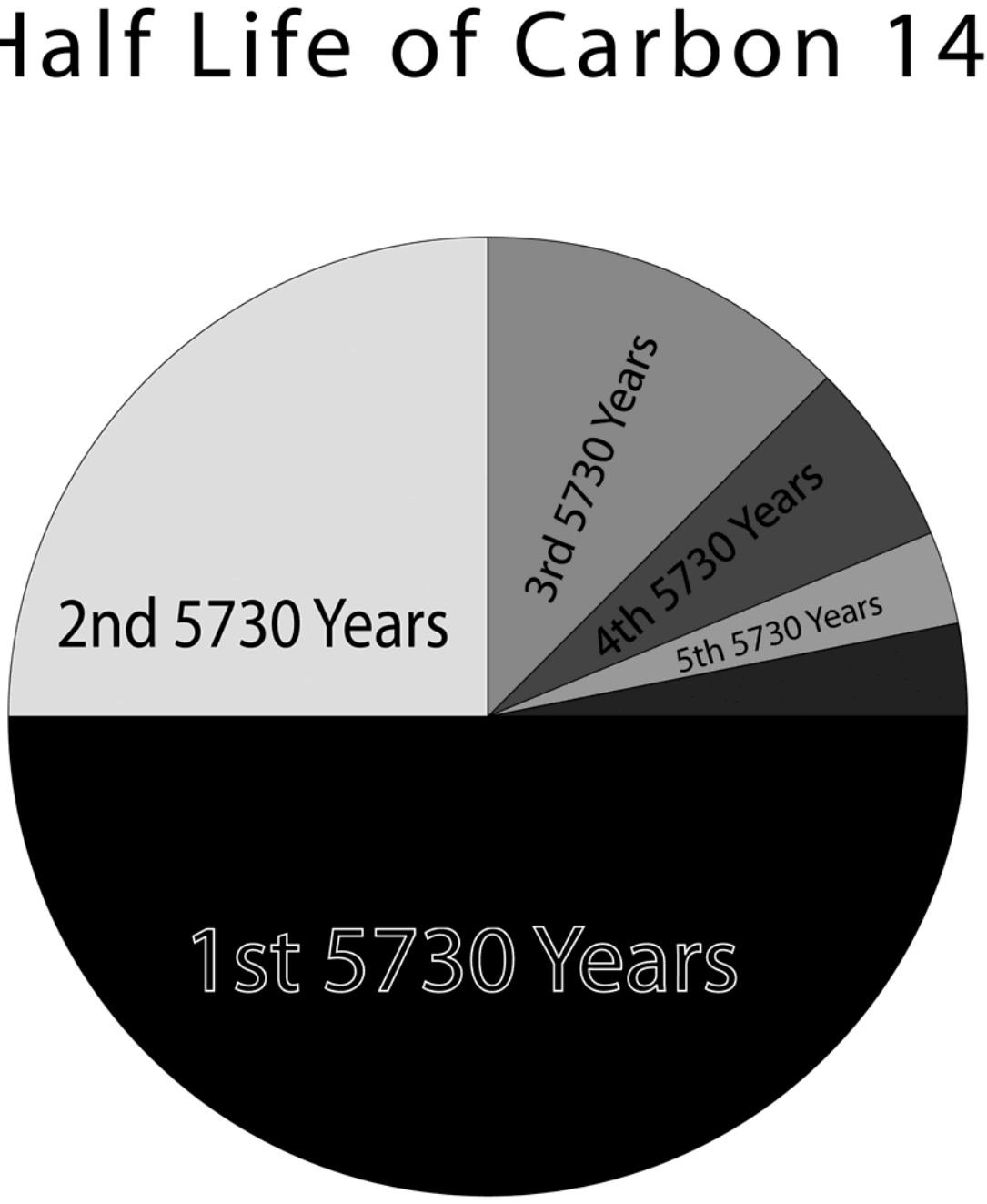
A or B **C or D**

B or C **E or F**

A or C **G or H**



Transparency – Pie Graph Showing Decay of Carbon-14



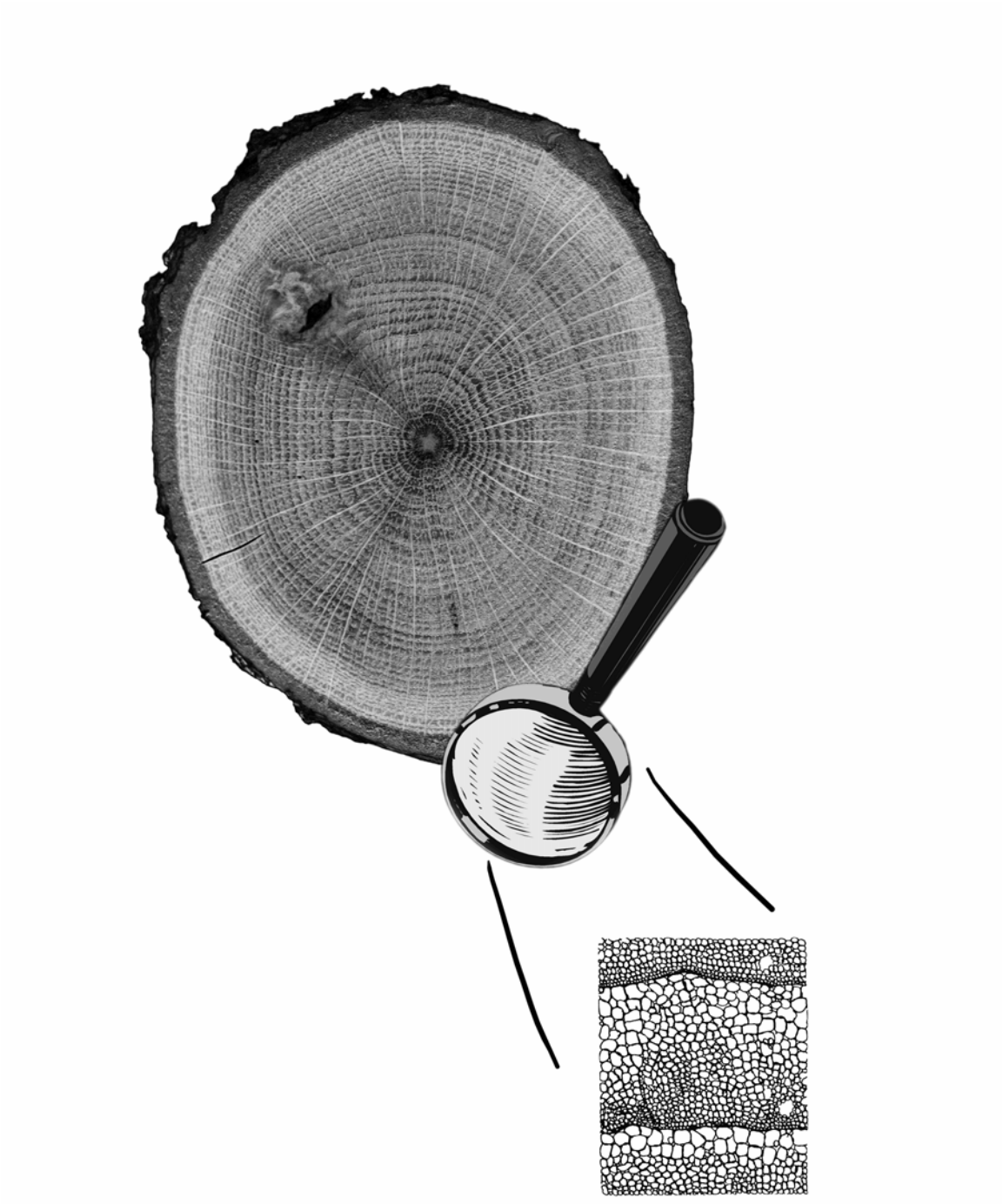
Transparency – "Sandwich" Showing Dating of Sites Using Potassium-Argon Dating

Layer 3 – volcanic ash – 1.9 million years old

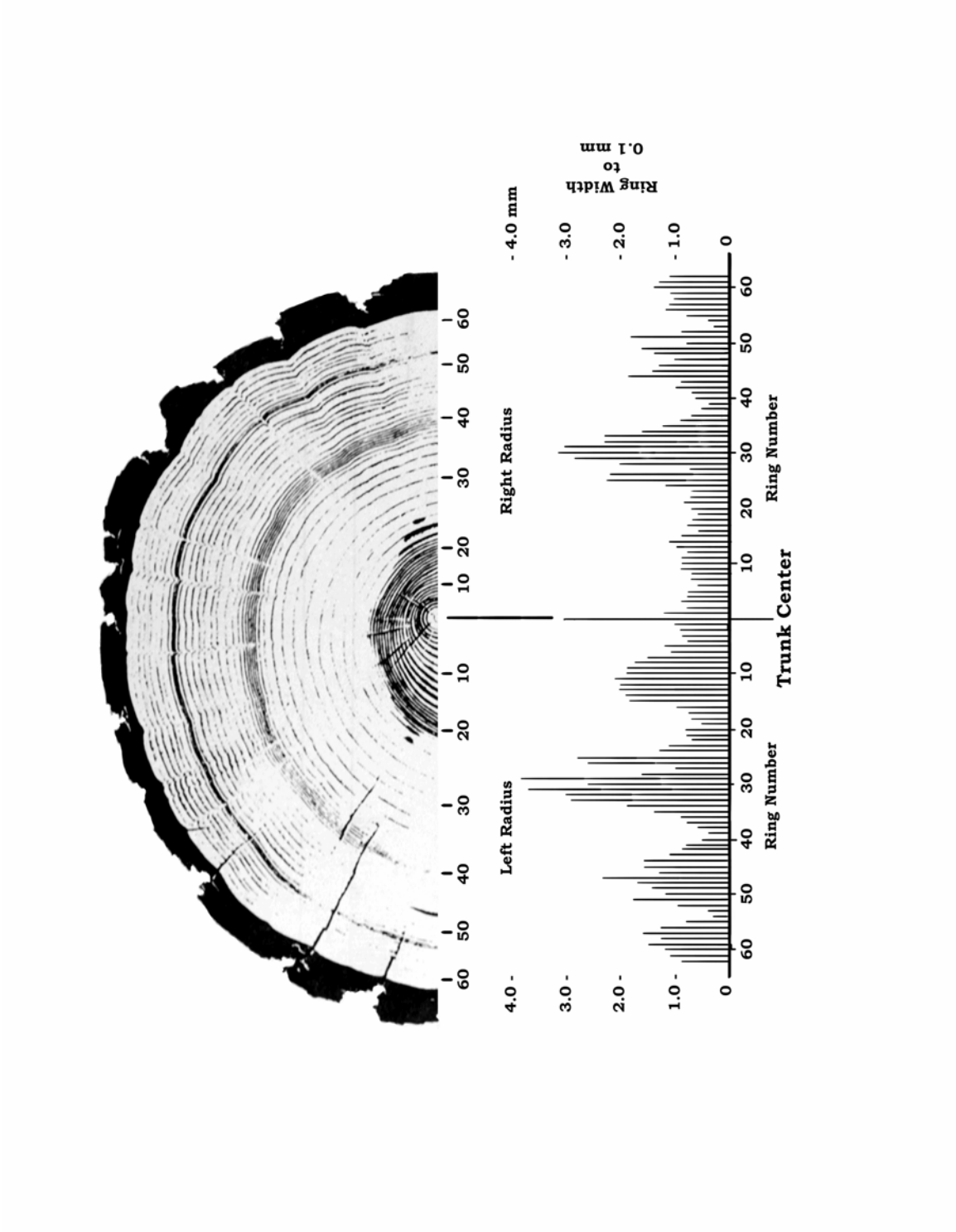
Layer 2 - human campsite XXXXXXXXXXXXXXXXXXXXXXX

Layer 1 – volcanic ash – two million years old

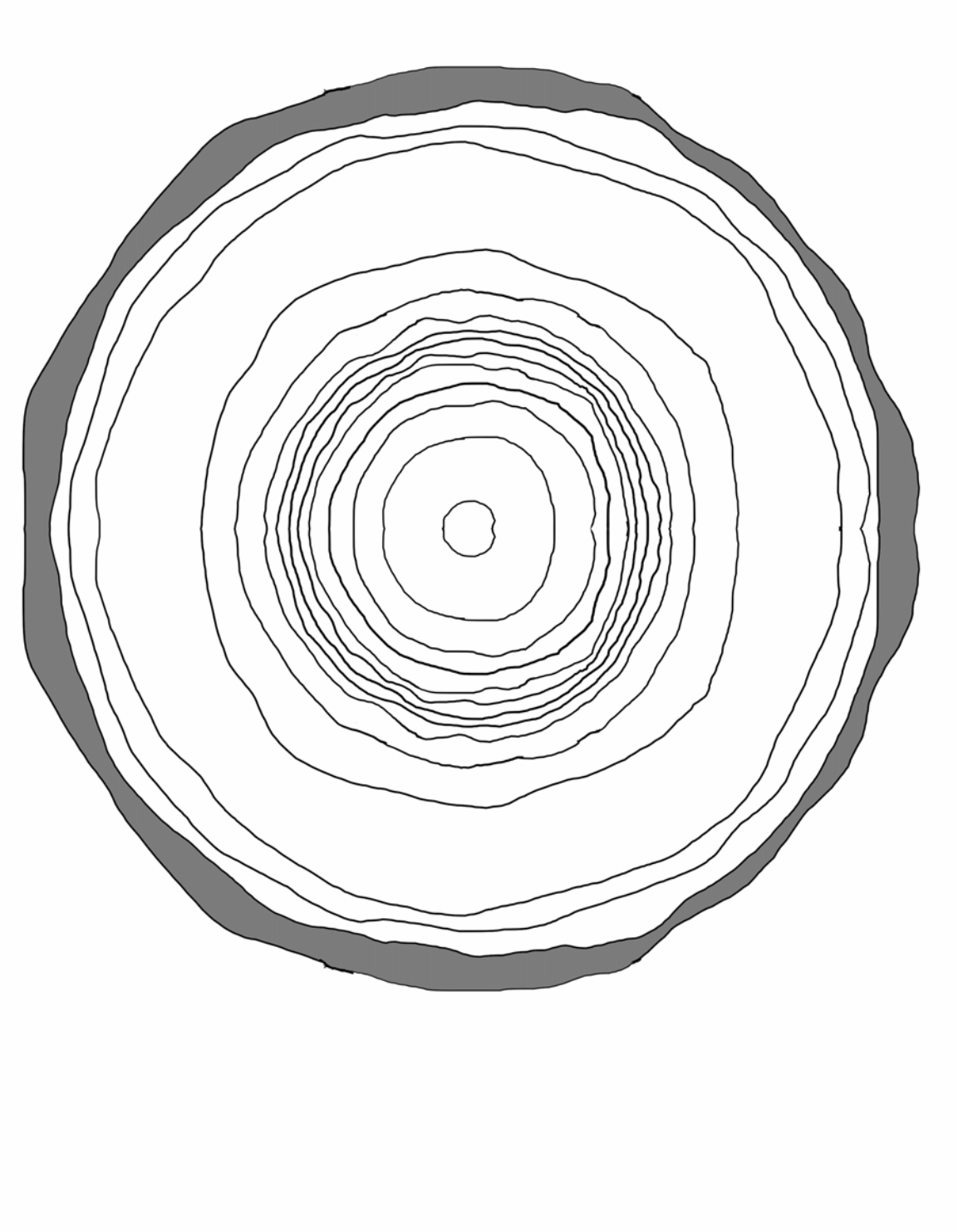
Transparency showing tree cell growth and tree cross-section



Transparency showing tree-ring skeleton graph



Dendrochronology exercise (one for each student)



SECTION TWO -- PENNSYLVANIA BEFORE THE EUROPEANS

Lesson Plan #6

Title of Lesson: History and Culture in Pennsylvania Place Names

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social studies (history, geography, and anthropology)

Main Concept: Place names contain important information about the history and characteristics of a place.

Skills Addressed: Reading comprehension, writing, oral communication, cooperation, and research

Objective: Students will learn that each place has a history; Pennsylvania has preserved Native American names; and that some names we use now were important to the Native Americans and settlers.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies I.a., II.c., III.g.
Grade 5 Social Studies I.a., I.c.; II.d.; III.g., III.h.; IV.b.
Grade 6 Social Studies I.a., I.c.; III.a., III.g., III.h.

Pennsylvania Department of Education (PDE):

Grade 7 History 8.1.9 B and 8.1.9.C
Geography 7.3.9 B
Grade 8 History 8.2.9 A, 8.2.9 B, and 8.2.9 C
Geography 7.3.9 C and 7.3.9 D

Materials/Equipment:

*Student Text: "History and Culture in Pennsylvania Place Names" (Chapter 6)
*Pennsylvania Map (one for each cooperative group)
*Local County Road Map (one for each cooperative group)

*Poster paper and drawing tools (one for each cooperative group)
*Internet access and/or library
*Speaker from local historical society
*Blackboard, whiteboard, and/or overhead projector
*Two blank transparencies, dry erase marker, and/or crayon

Anticipatory Set:

1. Ask students, "What could the names of places tell us about those places?"

> **Note**: Expect answers such as special characteristics (Hot Springs), names of founders, names of first and later settlers, importance of the place (i. e. Council Bluffs), etc.

2. Go around the room and ask each student his or her answer. If a student has nothing to say he or she should say, "pass."

3. Ask students, "Do you know what some place names mean?"

> **Note**: Since this may be obscure information, students answer by raising their hands

4. Ask students, "Are there any Native American place names in Pennsylvania, and if so, what are they, what do they mean?"

> **Note**: Since this may be obscure information, students answer by raising their hands.

5. Inform students that they will be discovering some messages about history and culture that are found in place names in Pennsylvania.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) This can be done through silent reading, choral reading, or you can read it with them.

1. Have students read the "History and Culture in Pennsylvania Place Names" in their student text.

- **Complete Student Text:**

> People all over the world give names to people, things, and places. A person's name might indicate that he or she has a particular characteristic, occupies a certain job, belongs to a particular family, is the descendant of an ancestor, or is the son or daughter of a particular person. In Japan, it was quite common for people to be named for the job they did such as porter, farmer, fisherman, or pilot. In Ukraine, a young woman's family name might be Stepanivna or daughter of Stephan.
>
> Things may be given names that indicate a purpose. When we hear the words "hammer" or "screwdriver" we think of tools made for a special purpose. Of course, not all names have to have

a connected meaning. A computer mouse has nothing to do with the small animal, except that some people think it has a tail. Some names are just invented names.

The name of a place may suggest an event, a characteristic, a person who settled there, or a place where settlers came from. A place called *Agua Caliente* may indicate that there is hot water, possibly from hot springs in the area. Because it is a Spanish name, it may also suggest that the people who named the place were Spanish speakers. English speakers might have called it Hot Springs. Waterford might mean that it was a good place to cross a stream or river.

In the United States, the names of places can come from many different languages. If you travel to Idaho, you may find French names such as Coeur d'Alene. Nebraska comes from an Oto Indian word meaning "flat water." New Jersey is named after the Isle of Jersey in England, and so on. The Wasatch Mountains in Utah are from a Ute word meaning "mountain pass."

Have you ever looked at a map of Pennsylvania and wondered why some places have the names they do? Some names represent Native American words, others European. Each name carries a message about the special characteristics of the place or its history. Pennsylvania is often translated as "Penn's Woodland." What does that mean? Just by looking at the name, we begin to suspect that maybe someone by the name of Penn was important enough to have this very big place named after him. We may be surprised to learn that it was not named after William Penn, but after his father Admiral Sir William Penn. Why was he so important that Pennsylvania refers to him?

The names of places in Pennsylvania can be important clues to the history of the people who lived there. Native American names are found throughout Pennsylvania, reminding us of the Native Americans who once lived throughout this state. Some of these cultures are now extinct or have moved elsewhere. However, we remember them through the names they left behind. The European settlers of Pennsylvania are now gone as well. By looking at the names they left behind, we can also learn about them, their beliefs, and their history.

In 1928, Dr. George P. Donehoo wrote a book called Indian Villages And Place Names In Pennsylvania. In this book, he gives many examples of why certain places have the names we see today. This book has been so popular that it has been reprinted several times. Let's take a look at some of the place names Dr. Donehoo wrote about.

The word Ohio may have come from a Seneca word which means "beautiful river." A community which has the English name "Canoe Place," may have that name because hundreds of years ago, early explorers or settlers discovered that local Native Americans used that location to put their canoes in the waters. These and other names remind us that hundreds of years ago Europeans and Native Americans were in constant contact with each other.

The Europeans often used existing Native American names instead of always inventing their own. Some names don't sound the same because some Europeans could not pronounce the Native American words. Sometimes Europeans just translated a Native American name into their own language. For example, Raccoon Creek, which enters the Ohio River in Beaver County, may be the translation of the Delaware name for the stream Nachenum-hanne or "raccoon-stream." At other times European settlers changed the name to a more familiar European name, which had no connection with its Native American name.

Sometimes, Native Americans gave their own names to European places. The City of Pittsburgh had several Native American names before it became a city. As early as the French occupation, the Delaware called the place Menanchk-sink, "where there is a fence" or a fort. They saw the French place and gave it their own name. In fact, by tracing all of the different names, which were used by Native Americans and settlers alike, Dr. Donehoo was able to write a short history of early Pittsburgh, just by discovering the different names for the area.

> Punxsutawney is known to everyone in America as the place where a ground hog predicts the weather. Have you ever thought why it has that name? According to Dr. Donehoo, it was once the name of a Delaware Village. Its name may have been originally Ponks-uteney or "gnat town." When we discover that a gnat is a biting fly, we can only guess at how unpleasant life might have been in such a place full of biting insects.
>
> Place names provide us with interesting clues about the people who named them, as well as about the places themselves. They can be a very useful source of information about the past.

2. Divide students into cooperative groups (4-5 students per group).

3. Distribute one Pennsylvania and one local map to each group.

4. Tell each group to make a list of ten place names from the Pennsylvania maps which they think are from Native American names.

5. Tell each group to make a list of ten place names from the Pennsylvania maps which they think are from European settlers' names.

6. Make a chart on the board or overhead transparency showing Native American place names in one column, European settlers' place names in the other column.

7. Have a representative from each group write five place names under each column.

8. Save these place names.

9. Have students discuss how these place names are the same or different from each other.

10. Tell each group to make a list of five place names from the local road map which they think are from Native American names.

11. Tell each group to make a list of five place names from the local road map which they think are from European settlers' place names.

12. Make another chart on the board or overhead transparency showing Native American place names in one column, European settlers' place names in the other column.

13. Have a representative from each group write two names under each column.

14. Save these names.

15. Have students brainstorm how and why these names are the same or different from each other.

16. Have students brainstorm what they think each name means, its history, etc.

17. Ask students, "What would you like to learn about these names?"

Closure:

1. **Option 1**: Invite a member of the local Historical Society to address the class focusing on the history of the name of the community as well as other local names.

Option 2: Visit the local historical society with the class to learn about local place names.

2. Have students discuss what the differences and similarities between Native American place names – after they have completed their assignments.

3. Have students discuss the kinds of messages about the people of the past they discovered from learning about place names.

Assignment:

1. Have each cooperative group research the name of two Native American place names and two European settlers' place names in Pennsylvania.

> **Note**: Students should use the Internet, library, or local historical society for their research. They can also use the first reference listed below, if available.
>
> **Note**: Have students pick these names from the blackboard or transparency list. Each group should pick different names with no overlap between groups.
>
> **Note**: Students can pick local names as well. Decide the number of place names to be researched as appropriate to the particular class and available resources.

2. Have each group give an oral presentation and create a poster about what they learned.

3. Display the posters in the classroom or in the hall for other students to enjoy.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials and artifacts can be assembled in a student/group portfolio.

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

Donehoo, Dr. George P. *Indian Villages And Place Names In Pennsylvania.* The Telegraph Press, 1995.

Lesson modeled after: Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. Chapter 27, "State Place Names." In *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades.* United States Department of the Interior, Bureau of Land Management, 1993.

Lesson Plan #7

Title of Lesson: What was Pennsylvania Like Before European Contact?

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social studies, anthropology, environmental studies

Skills Addressed(s): Reading comprehension, oral communication, critical thinking, and cooperation

Main Concept: Pennsylvania originally was a heavily forested land, abundant in resources, but even before 1492, the forests was altered through human settlement and growing of native seed crops as well as corn, beans, and squash.

Objective(s): Students will be able to describe the resources provided by Pennsylvania's forests; explain what the Eastern Agricultural Complex was; contrast the later corn, beans and squash agriculture with earlier gardening; and indicate how Native Americans modified the landscape in Pennsylvania.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies – I.a., III.h.
Grade 5 Social Studies – I.a., III.h., III.k.
Grade 6 Social Studies – I.a., III.h., III.k.

Pennsylvania Department of Education (PDE):

Grade 7 History – 7.3.9.B
Grade 8 History – 7.3.9.C and 7.3.9.D

Materials/Equipment:

*Student Text: "What was Pennsylvania Like Before European Contact?" (Chapter 7)
*Blackboard, whiteboard, and/or overhead projector
*Blank transparency, dry erase marker, and/or chalk
*Matching the Forest Habitat transparency
*Vocabulary transparency
*Pictures of plants and animals from Pennsylvania's forest (optional)
*Pictures of plants domesticated as part of the Eastern Agricultural Complex (optional)
*Poster paper and drawing materials (one set for each cooperative group)
*Library and Internet access

*Indian Recipes and ingredients (optional)
*Materials for individual student essays

Anticipatory Set:

1. Tell students that they are going to learn about the environment of the past and about the ways pre-European Pennsylvanians used it.

2. Ask students, "What does the word 'environment' mean."

> **Note**: By environment we mean the total surroundings in which people live.

3. Ask students to think about the environment in which they live.

4. Ask each student to name two things about their environment?

> **Note**: Make sure that their examples include natural, technological and social aspects of their environment. For example trees and rivers, highways and cars, friends and parents all are parts of their environment.

5. Make a list of items on one side of the board or on overhead transparency.

- **Alternative:** Have students draw a picture of the environment in which they live and then select several students to explain their pictures.

6. Tell students that the people who lived here, before Europeans settled Pennsylvania, also had an environment with natural, technological, and social aspects in it.

7. Ask students, "What do you think these pre-European environments and people were like?"

8. Make a list next to the previous list for comparison.

- **Alternative:** Students could also draw a picture of what they think past environments in Pennsylvania were like.

9. Tell students that they will be finding out how accurate their ideas about past environments and people really are.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) This can be done through silent reading, choral reading, or you can read it with them. The assigned readings are included for your reference. Each of the following sections will indicate the necessary student readings, and a focus question to facilitate discussion and information that you, the teacher will use to clarify and elaborate on the reading material. You may want to get some Cooperative

Groups working together as the students become familiar with the concepts and terminology of anthropology.

1. Student Text #1:

> Pennsylvania has changed in many ways since Europeans began settling here. Not only has the culture of the people living here changed, but Pennsylvania has changed environmentally as well. Today, much of Pennsylvania is a mix of cities, suburbs, and farmland. The landscape has changed so much that William Penn would hardly recognize "Penn's Woods" as Pennsylvania was once called. Think about this name. It reminds us of the most important feature of Pennsylvania before Europeans arrived: it was a forest.
>
> You've probably enjoyed a Pennsylvania forest when you have been on a summer picnic, gone on a hike, or attended a camp. Maybe you even live near a forested area of the state. However, keep in mind that most of the forests you can visit today are not original. They represent the new growth of a forest that was once cleared for lumber or fuel. One way in which the forests of Pennsylvania are different from those of the past is that they have a lot of shrubs and smaller trees in them. They have a much less open forest floor than the original forests in which the leaves of tall, old trees blocked the light from reaching the forest floor, making it hard for plants to grow below them. Another difference is that some species of trees and other plants are no longer present or are present in smaller numbers than they once were. For example, the American chestnut once was abundant in Pennsylvania's forests but has disappeared due to the chestnut blight, a fungus that was introduced at the beginning of the twentieth century.

- Ask students, "Did you know that most of Pennsylvania's forests are not the original ones that were here when Europeans arrived?"

- Ask students, "Have any of you ever visited an undisturbed forest in Pennsylvania?"

> **Note**: There are a few remnants of the virgin forest in Pennsylvania. One area in the Allegheny National Forest is called Heart's Content.

- Ask students, "How is forest that has not been cleared different from those forests that have regrown after logging?"

2. Student Text #2:

> Just because most of Pennsylvania was forested before modern times, doesn't mean that there was no variety in plants and animals throughout our state. In the first place, there was a difference between the low coastal areas, the mountain ridges, valleys, and the plateau regions of the state. Altitude, rainfall amounts, and average temperatures weren't the same everywhere, leading to three broad types of forest. The **boreal forest** consisted of mainly evergreen trees (**coniferous trees** like spruce and hemlock). It was found at the highest ridge tops. The **transition forest** contained both evergreens and tree species that drop their leaves in the fall (**deciduous trees** like oak and beech). This forest covered much of central and northern Pennsylvania. The **mixed deciduous forest** didn't have many evergreens at all. It was found in the western and southeastern part of the state. Each of these forest types had other plant and animal species usually associated with it.
>
> Second, rivers and other bodies of water, as well as clearings in which trees gave way to grass and shrubs, broke Pennsylvania's forests. In other words, within the forest types there was a variety of **habitats,** each with their own interacting **communities** of plants and animals. While large game

animals like the white-tailed deer would have been found in many of these communities, other animal species would only have been part of certain communities. Many species of plants also require specific amounts of water or types of soil and so would have been unevenly distributed through the forest.

Finally, within forest communities themselves there were vertical layers of life interacting together. These included the **soil layer** where all kinds of burrowing animals such as woodchucks, moles, and earthworms lived; the **forest floor** where there were plant species like ferns, mosses, and small wildflowers, as well as animals like mice, reptiles, and wild turkeys; and the **shrub layer,** with its thickets of species like the wild type of the rhododendrons that may grow at your house. The other forest layers were the **understory**, which contained small trees and animals like woodpeckers and squirrels; and the **forest canopy,** where tall trees lifted their leaves to the sun and hawks and owls as well as bats could be found.

As you can see, Pennsylvania's forests were complicated **ecosystems** that you could spend your life trying to understand, even if they hadn't been changed so much over the last few centuries. However, what is most interesting to archaeologists about these forests of the past is that humans were part of them. Attracted to the many kinds of plant and animal foods and other **resources**, humans settled in Pennsylvania's forests long before Europeans arrived here. Pennsylvania's forests made a good home for these people, who were the ancestors of the American Indians of Colonial times. The ways in which they used and changed the forest were both similar to and different from those that later Pennsylvanians adopted. Archaeology helps us make comparisons between these people and ourselves.

- Ask students, "What are some of the plants and animals found in Pennsylvania's forests?"

> **Note**: Students should answer with examples from the text and from their personal knowledge. Students in rural areas may be more familiar with plants and animals in each of these habitats than might urban students.

- Tell students that each of these kinds of plants and animals has preferences and requirements for survival that make it likely to be found in certain parts of Pennsylvania's forest rather than others.

- Show students the "Matching the Forest Habitat" transparency and review the associations.

- **Option 1**: Tell students you are going to see if they can associate various plants and animals with different parts of the forest. Hold up cards, show slides, or power point images of these plants and animals and have students tell you what layer of the forest they match with. Your school's science teachers may have the images you require for this option.

> **Note**: In some cases species may be found in more than one layer so more than one answer would be acceptable.

- Tell students that, as has been pointed out, Pennsylvania's forests have been changed by logging and other disturbances over the last two hundred years.

- Ask students, "Do you think Native Americans could also have affected the environment in which they live? How could they have done this?"

3. Student Text #3:

> You may think that modern people are the only ones who have changed the environment. Certainly, because of the large number of people living in Pennsylvania today, not to mention our advanced technologies, we have a great effect on the land in which we live, and we need to become more aware of the ways we are hurting the environment.
>
> However, you shouldn't think that the Native Americans who lived in Pennsylvania before Columbus didn't change the forests at all. Like people everywhere, they used the plants and animals around them for various reasons. In fact, they knew a lot more about these plants and animals than most of us do today. As a result, Native Americans were able to influence and change the habitats of the plants and the animals around them in desired ways. These practices didn't cause the degree of environmental destruction we worry about today, but they did change the forests in important ways.
>
> In fact, Native Americans may have caused some of the characteristics of Pennsylvania's forests found by the Europeans. Clearings within the forest were not just the result of natural factors, but also the result of clearing by natives for villages or to create fields and gardens. Indians used fire to clear their fields. They also used it to help various species of plants and animals they hunted and gathered. For example, plants that easily grew in disturbed areas produced many wild seeds that could be eaten. Burning off some of the forest meant that these plants had a better chance of sprouting. Deer, which was often used for meat by most of Pennsylvania's native people, also prefer open woodlands or the edge of clearings. This means that the numbers of deer in an area probably would have gone up as people cleared areas of dense forest. Archaeologists have evidence that Native Americans did some of this kind of changing of their environment, on purpose, long before the Europeans arrived.

- Ask students, "Do you think these practices of Native Americans were good or bad for the environment in general?"

- Make a list on the board or overhead transparency of positive and negative things about forest clearing.

- Tell students that you are now going to learn more about the ways Indians used their environment to get food and raw materials.

4. Student Text #4:

> The first humans to live in Pennsylvania, the Paleo-Indian, and Archaic people described in Chapter 9, were **hunter-gatherers** who used the large amounts of wild plants and animals in the forests for survival. At first, these people moved around a great deal, camping in one spot for only a short period. They hunted deer, trapped smaller animals like squirrels, took birds like turkey and ducks, fished and collected mussels in the rivers and streams, and collected nuts and berries. They made a variety of stone and bone tools and used animal skins for clothing. It was a good life, except at the end of the cold winter months when plant foods were uncommon and other animals were lean. Archaeologists think that this fact probably led people to store what food they could in pits and caches.

Over time, this way of life involved less and less moving around. Groups began to settle into small communities and population increased. These changes required many small adjustments in lifestyle, but one of the most important changes people made was to begin to encourage and then actually grow some of the wild plants they used. What's interesting is that many of these plants are ones you and I would probably pull out of our gardens. We don't recognize their food value, but early Native Pennsylvanians did. Long before the beginning of our current calendar, Native Americans began to grow these plants on purpose, altering them to increase the size and amount of seeds.

Archaeologists call the plants that people began to grow the **Eastern Agricultural Complex.** One important indication of cultivation is an increase in size of the seeds compared to wild varieties. Although evidence for this complex from Pennsylvania is incomplete, there is enough to believe that Native Americans here also began to use plants in this way. However, people in Pennsylvania and further north may not have begun this practice quite as early as elsewhere in the East. The first plant Native Americans began to cultivate was a gourd, which is a type of squash. By 7,000 years ago, people in some areas of the East were growing gourds probably for use as a container or maybe for use as a float on their fishing nets. A little later, at about 6,000 years ago, the sunflower was being grown as well. The weed species in this group are called sumpweed, chenopodium, maygrass, knotweed, and little barley. The seeds of these plants are either high in carbohydrates or in fat. They were probably important in native diets. By 4,000 years ago, an American variety of tobacco had been added to the complex.

Native Americans were farmers long before Europeans came here. However, you shouldn't imagine fields like you see in farmlands today. What these people were doing was much more like gardening. That is, they planted and tended a small number of plants of several of these species in small plots. Besides this planting, hunting and gathering continued. Therefore, native people had a **mixed economy** long after they began planting native seed crops. Although they were using burning and other methods to make room for their crops, they continued to rely on all the kinds of forest products that had been important for centuries.

- Ask students, "What was the Eastern Agricultural Complex?"

- Show students pictures of plants included in the Eastern Agricultural Complex.

- Ask students, "Which plants do you recognize as plants people grow today and which ones are considered weeds?"

    - **<u>Alternative</u>:** Have students do library or Internet research on one of these plants and they're nutritional value. Have them do oral written reports on what they find out.

- Ask students, "Why do you think people decide to grow some plants and not others? Why do these decisions differ between cultures?"

5. Student Text #5:

Farming among Native Americans changed again, throughout the Eastern Woodlands, somewhere between A. D.800 and 1,000. At this time, agriculture based on corn, beans, and squash became important. When Europeans arrived, nearly all Native Americans living in Pennsylvania grew these plants, although the earlier crop plants probably were still cultivated by some groups.

Neither corn (or maize) nor beans originally grew in Pennsylvania or even in nearby areas. These plants were imports from Mexico by way of the southwestern part of the United States. Corn was first brought to the East several centuries before this shift to corn, beans, and squash agriculture. Pennsylvania Native Americans first simply added it to the small garden plots they were already planting. Beans arrived in the area much later in time, but their importance is harder to figure out because they don't preserve as well archaeologically.

The Iroquois called corn, beans, and squash the "three sisters" because they grew them together in their fields. We know today that these plants complement each other in terms of nutrition and that they also work together to keep soils in better condition. You may have learned stories about Native Americans in other parts of the East teaching colonists to grow these plants. Certainly this type of agriculture was productive and efficient.

Thus, farming based on corn, beans, and squash yielded large quantities of food. Archaeologists link this kind of development with the presence of large numbers of people in big villages and towns. They also link the surplus food produced at this time with more complicated systems of political control, though not all Pennsylvania Native Americans fit this model.

Corn, beans, and squash agriculture required people to clear large fields. Archaeologists believe this was done through a version of **slash and burn agriculture**. This means that people cut down brush and burned it in field areas in order to clear the land. Fields prepared in this manner benefited from the nutrients in the burned brush and could be farmed for a number of years. People continued in this way by clearing fields around their villages, working them until they were not productive, and then clearing new fields (while the original ones were abandoned). Deer and other animals were attracted to the abandoned old fields and could be hunted there. Eventually, maybe every 20 to 30 years, villages had to be moved so that more land could be cleared. This process certainly opened up the forest, created new habitats, and established new plant and animal communities.

- Ask students, "How was corn, beans and squash agriculture, developed by A. D. 1000, different from the earlier mixed economies you read about in Student Text #4?"

- Have students research the complementary nature of the maize, beans, and squash (three sisters) through library or Internet research.

  Note: These plants can be complementary because they grow well together. They can be complementary because they supply necessary amino acids together. Answers can be presented in essay form in two paragraphs.

- Tell students that Native Americans continue to use these foods today, as do we.

- Share the Indian Recipe transparency with the class.

- **Optional**: Have the school cafeteria or the class prepare the foods found in these recipes and enjoy a feast with the class.

  Note: Be sure you have parental permission for this cooking and eating activity. Allergies, religion, and eating ethics might enter into consideration especially where pork is concerned.

- Ask students to explain how slash and burn agriculture works and discuss how this method of land use differs from what most farmers in Pennsylvania practice today?"

- **Alternative**: Have each student research slash and burn agriculture. Have them address the following questions. Is it still practiced today? What are its benefits? What are its drawbacks?

> **Note**: The results should be prepared as a formal essay.

Closure:

- Review the vocabulary transparency.

6. Student Text #6:

> In many ways, the Native Americans who lived in Pennsylvania before the Europeans arrived were not different from European settlers. Both groups relied on the land for farming and used the products of Pennsylvania's forests to meet their needs for food. Both groups changed the environment in the process of surviving. As you read about the lives of early European settlers in your continuing studies, think about their similarities with Pennsylvania Native Americans and try to make comparisons with what you have read here.

- Ask students to summarize what they have learned about Native American use of the environment in this section.

- Ask students, "Now that you have read this chapter, do you think early Pennsylvania Native Americans were more or less like us and why?"

> **Note**: Student discussion should focus on use of the environment and its resources.

- **Optional:** Have students write a short essay about what they think ,using examples from what they have learned in this unit.

Assignment:

1. Divide students into cooperative groups (4-5 students).

2. Have each group research the habitat requirements of a variety of plants and animals which live in Pennsylvania's forests using library and Internet resources.

3. Have each group make a chart listing or showing the plants and animals found in each of the three main types of forest mentioned in the text: boreal, transition and mixed deciduous.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials and artifacts can be assembled in a student/group portfolio. A vocabulary list and content terminology can also be assessed through objective means.

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion: Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

Wilbur, C. Keith. *Indian Handicrafts: How to Craft Dozens of Practical Objects Using Traditional Indian Techniques*. The Globe Pequot Press, Guilford, CT.

Transparency – Vocabulary

Lesson 7 - Vocabulary

A **boreal forest** consists mainly of evergreen trees (**coniferous trees** like spruce and hemlock).

A **transition forest** contains both evergreens and tree species that drop their leaves in the fall (**deciduous trees** like oak and beech).

A **mixed deciduous forest** doesn't have many evergreens at all.

A **habitat** is an environment where certain plants and animals prefer to live.

A **community** of plants and animals is a group of plants and animals who consistently live together.

A **soil layer** is a habitat where all kinds of burrowing animals such as woodchucks, moles, and earthworms live.

A **forest floor** is a habitat where there are plant species like ferns, mosses, and small wildflowers as well as animals like mice, reptiles, and wild turkeys.

A **shrub layer** is a habitat with plant thickets such as wild rhododendrons.

The forest **understory** contains small trees and animals like woodpeckers and squirrels.

The **forest canopy** is where tall trees lift their leaves to the sun and hawks and owls as well as bats could be found.

An **ecosystem** refers to a network of interrelationships between plants, animals, and other parts of the environment.

Resources are plant, animal, geographical, and mineral parts of the environment, which can be used for survival.

Hunter-gatherers are societies, which depend on large amounts of wild plants and animals for survival.

The **Eastern Agricultural Complex** refers to the variety of wild plants, which were cultivated.

A **mixed economy** occurs when people get food in a variety of ways including hunting and gathering of wild plants and animals as well as cultivating wild plants in small gardens.

Slash and burn agriculture occurs when people cut down brush and burn it in field areas in order to clear the land.

Transparency – Matching the Forest Habitat

Forest Habitat	Examples of Plants and Animals
Forest Canopy	Tree tops of tall trees Hawks, owls, and bats
Understory	Small trees Woodpeckers and squirrels
Shrub Layer	Rhododendrons
Forest Floor	Ferns, mosses, small wildflowers Mice, reptiles, and wild turkeys

Transparency - Indian recipes for corn

ASHCAKES:

Ingredients: Coarse cornmeal
Salt
Water
Dried berries (optional)
Fresh corn husks

Directions: Make a thick paste of cornmeal, salt, water and berries if included. Shape into cakes and wrap in fresh corn husks. Bake in the ashes for about 40 minutes, turning over once.

CORN PORRIDGE:

Ingredients: ½ cup of dried, hulled corn
Water
1 teaspoon salt
1 teaspoon honey or maple syrup

Directions: Cover dried corn with water and soak overnight. Drain water and add 1½ cups water, salt, and honey. Bring to boil and simmer for several hours, stirring occasionally and adding water if necessary. Serve thin pudding with butter and more honey or syrup.

SUCCOTASH:

Ingredients: Equal Parts Dried Kidney Beans and
Fresh Sweet Corn (scraped from the cob)
Diced Pork
Seasoning

Directions: Soak overnight and boil kidney beans with diced pork for several hours until softened. Add sweet corn and boil for 20 minutes until stew is thick. Season to taste.

Lesson Plan #8

Title of Lesson: Where Did the Ancestors of Native Americans Come From?

Grade Level: 4, 5, 6, 7, and 8

Content Area(s): Social studies, history, and geography

Skills Addressed: Reading, verbal and written communication, research, and cooperation

Main Concept: The ancestors of the earliest Native Americans crossed the Bering Strait land bridge to come to North America.

Objective(s): Students will be able to identify the location of the land bridge and consider the evidence for this crossing.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies - II.c.; III.h.
Grade 5 Social Studies - II.d.; III.h.
Grade 6 Social Studies - II.b., II.d.; III.d., III.h.

Pennsylvania Department of Education (PDE):

Grade 7 History – 8.1.9.A – C and 8.4.9.E
Geography – 7.3.9 B
Grade 8 Geography – 7.3.9.C

Materials/Equipment:

*Student Text: "Where Did the Ancestors of Native Americans Come From?"(Chapter 8)
*Blackboard, whiteboard, and/or overhead transparency
*Map of North America showing Alaska and North East Asia
*Transparency showing extent of glaciers
*Transparency showing location of land bridge
*Vocabulary transparency
*Poster board and drawing materials (optional) (one for each student)
*paper and writing materials for essay (one for each student)

Anticipatory Set:

1. Ask students, "Who lived in North and South America before the European settlers came?"

> **Note**: Expect answers such as no one or Native Americans.

2. Tell students that they will be learning where and how the earliest ancestors of Native Americans came to North America.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) This can be done through silent reading, choral reading, or you can read it with them. The assigned readings are included for your reference. Each of the following sections will indicate the necessary student readings, and a focus question to facilitate discussion and information that you, the teacher will use to clarify and elaborate on the reading material. You may want to get some Cooperative Groups working together as the students become familiar with the concepts and terminology of anthropology.

1. Student Text #1:

> Every culture tries to define and explain the universe in which it exists. Religion, philosophy, and science are all used to do this. In our culture, we often try to describe and explain the world we live in by using science. Sciences such as geology, astronomy, biology, medicine, and others provide us with evidence with which we can understand our world. For many people, religion is also used to define and explain the universe. If we were to ask some Native American religious leaders where their ancestors came from, they might answer, "We have always been here." They would be correct. The ancestors of the Native Americans were the very first people to live in the Americas. There were no other people who lived here before them.
>
> When the Europeans came to North America, they discovered a continent full of people. Archaeologists estimate that there may have been over 20 million people living in North and South America at the time of Christopher Columbus' voyage in 1492. All Native Americans were not the same. If you traveled across the continents, you would encounter hundreds of different languages and cultures. Archaeological evidence suggests that Native Americans and their ancestors have been in the Americas for over 15,000 years. Some archaeologists believe that the ancestors of Native Americans arrived in the Americas before 20,000 years ago. There are archaeologists hard at work today looking for evidence of these earliest Native American ancestors. Have you ever wondered where the ancestors of the Native Americans came from?

- Ask students, "Can you name some of the Native American cultures that exist today?"

> **Note**: Expect answers such as Woodland Indians, Plains Indians, etc. These are not the names of specific cultures. They are the names of ecological areas by which Native Americans are sometimes grouped. Other students will provide answers such as Navajo, Hopi, Lakota, Iroquois, etc. These are the names of actual native cultures.

- Tell students that cultures are always changing. Native American cultures of today are different from those of their ancestors at the time of earliest European settlement. Some cultures, such as the Erie, became extinct 350 years ago.

2. Student Text #2:

> Archaeologists, working with geologists, botanists, zoologists, human biologists, linguists, and others, have found evidence that the earliest ancestors of Native Americans may have come from northeast Asia. It may surprise you to learn that they may have walked from Asia to North America.
>
> If you look at a map, which shows northeast Asia and Alaska, you will see a body of water, called the Bering Strait, separating Asia from Alaska. If there was water there, how could people have walked across the strait? The surprising answer is that sometimes there was dry land. Where did the land come from? The land is still there, but covered by the waters of the Bering Sea and Arctic Ocean. To find a better answer, we have to look at the earth's climate.

- Show students the location of the Bering Strait on the map or transparency.

3. Student Text #3:

> For the past 100,000 years, parts of the earth were sometimes covered with large ice sheets called glaciers. When the earth's climate was very cold, for thousands of years at a time, glaciers would form, covering parts of many continents. When it warmed up again, the glaciers would slowly melt. Then, it would get cold again, glaciers would form again, and so on until today, when we are in a warming climate.
>
> **Glaciers** are made of ice, which is made of water. Where did the water come from? This water came from the oceans. Next time you watch the weather on television, take a look at where many rain clouds come from. They often form over a sea, lake, or ocean and move onto land, where the moisture falls in the form of rain or snow. Imagine a time, when it was so cold that the snow never melted. It was winter every day of the year. Year after year it snowed, but the snow never melted. After thousands of years, the snow pressed upon itself and formed ice which could be many miles thick. Geologists tell us that the glacier which formed Niagara Falls was over one mile thick. Now, let's look at the oceans at the time of the big glaciers. When the snow didn't melt, water did not flow back into the oceans.
>
> Huge glaciers covering large parts of a continent trapped the water on land. As a result, the ocean levels dropped, sometimes by as much as 400 feet and more all over the world. Shallow sea floors around the world became dry land. The Bering Strait Land Bridge was a good example of such an exposed sea floor. When it was very cold for thousands of years, the sea level dropped hundreds of feet. This drop in sea level exposed a land bridge, which was over 1,000 miles wide. When it warmed up, the land bridge was covered with water again. Sometimes the land bridge was completely covered, other times parts of the land were visible. Archaeologists suggest that people from Asia may have crossed this land bridge into North America. It is important to remember that the land bridge was not covered with glaciers. This was a real land bridge.

- Show students the ice sheet transparency and point out the extent of the glaciers.

- Ask students, "What else, besides ice and water can be found in a glacier?"

> **Note**: Glaciers can contain boulders, gravels, and finely ground up rocks.

- Tell students that when a glacier melts, the ice turns to water and flows away. Left behind are all of the gravels, boulders, etc. Geologists can tell how far a glacier extended by looking for and plotting the location of these remains. Moraine State Park in Pennsylvania is an example of a place where a glacier stopped, melted, and left huge piles of stone debris called moraines.

4. Student Text #4:

> Archaeologists have named this land bridge **Beringia**. Working with geologists, botanists, zoologists, and others, some archaeologists spend all of their time discovering what life was like on the land bridge. They suggest that once the land was exposed, plants and animals settled on the land and lived there for thousands of years at a time. They are trying to reconstruct the ecosystem of Beringia. An **ecosystem** is the way plants and animals interact with each other in an environment. This is very difficult work, since today the ancient land bridge surface is not only under water, but also under a layer of silt.
>
> Why did people cross Beringia? Archaeologists believe that they did so in their search for food. The plants and animals on Beringia could have been used by the hunters and gathers of northeast Asia as part of their food supply. Because the distance is only a little over 50 miles at the narrowest point, they could have easily traveled into North America and not known that they had left Asia. Some people may have lived all of their lives on Beringia and never entered either continent. Eventually their descendents traveled south until they occupied both North and South America.

- Review the vocabulary words from the vocabulary transparency.

- Ask students, "How does our climate today compare with that of Beringia and adjacent North America?"

> **Note**: Expect answers such as we have seasons including summer, it is not always snowing, we still have winter, etc.?"

5. Student Text #5:

> When did people cross Beringia? Archaeologists still don't know how many times different groups of people traveled from Asia across Beringia. They still don't know when the earliest people may have arrived in North America. It may have been as early as 25,000 years ago, since the land bridge was no longer under water at that time. These questions continue to be important research problems for archaeologists. Archaeologists are busy looking for the places where these early peoples lived in both northeast Asia and Alaska. They hope to find evidence of tools and byproduct materials, which will allow them to make a cultural connection between the people of the two continents. Everyone agrees that Native Americans were here for at least 15,000 years before the Europeans moved into the Americas.

- Ask students, "Why is it important to study archaeological sites in both northeast Asia and Alaska?"

> **Note**: If the same people traveled from Asia to Alaska and back over the land bridge, archaeologists might find evidence of similar tools, shelters, and foods. This would provide more evidence that people actually crossed the land bridge during the Ice Age.

Closure:

1. Ask students, "Are there any other sources of evidence which can tell us that the ancestors of Native Americans came from Asia?"

> **Note**: If they answer, they may suggest similarities in physical appearance, DNA, blood types, and language in additional to cultural information.

2. Tell students that physical anthropologist Christy Turner compared the shape of teeth of thousands of ancient and modern Asians and Native Americans. He observed that the teeth of some Native Americans are similar to some northern Asians. Geneticists have examined blood proteins and DNA. They also suggest a similarity between Native Americans and northern Asians. Other scientists are studying how similar or different Native American languages are to some northeast Asian languages.

3. Ask students, "Can you suggest any other ways of crossing from Asia to North America?"

> **Note**: Expect answers such as by boat or walking over winter ice.

4. Tell students that archaeologists continue to look for evidence of how and when the earliest ancestors of the Native Americans came to North America.

Assignment:

1. **Option 1**: Tell each student to write a story about a day in the life of a child living in Beringia.

> **Note**: Students can present this in essay form or in book form with illustrations.

> **Note**: The option to write a story about a child growing up in an archaeological culture will be available in the next chapter as well. If you choose this option, children will have an opportunity to compile their own book of stories.

2. **Option 2**: Have each student identify the plants, animals, and climate of Beringia from library and/or Internet resources and write a short essay detailing what they learned. **Alternative**: Have students make a chart or poster showing what they learned of life on Beringia.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials and artifacts can be assembled in a student/group portfolio. A vocabulary list and content terminology can also be assessed through objective means.

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

Fagan, Brian M. *Ancient North America: The Archaeology of a Continent*, 2nd Edition. Thames and Hudson, 1995.

Kent, Barry C. Discovering Pennsylvania's Archaeological Heritage, Revised Edition. The Pennsylvania Historical and Museum Commission, 1994.

Wolynec, Renata B., *et al*. *Project Archaeology: Pennsylvania – An Archaeology Curriculum for Middle School Grades Five Through Eight*. Pennsylvania Archaeological Council, 1995.

Transparency - Vocabulary

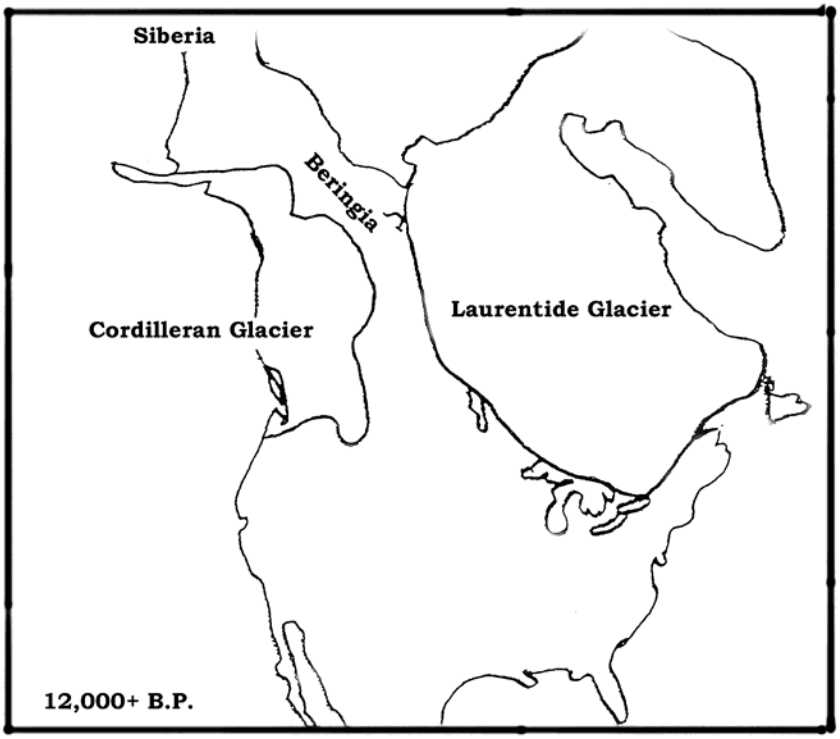
Lesson 8 - Vocabulary

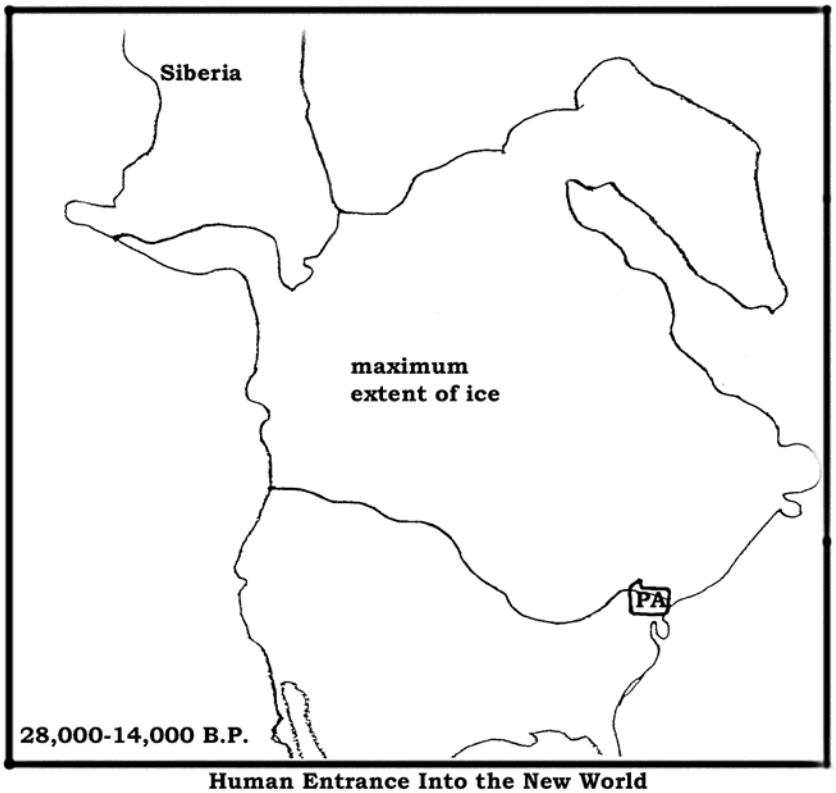
Glaciers are continent-sized sheets of ice.

Beringia is the name scientists give to the Bering Strait land bridge.

An **ecosystem** is the way plants and animals interact with each other in an environment.

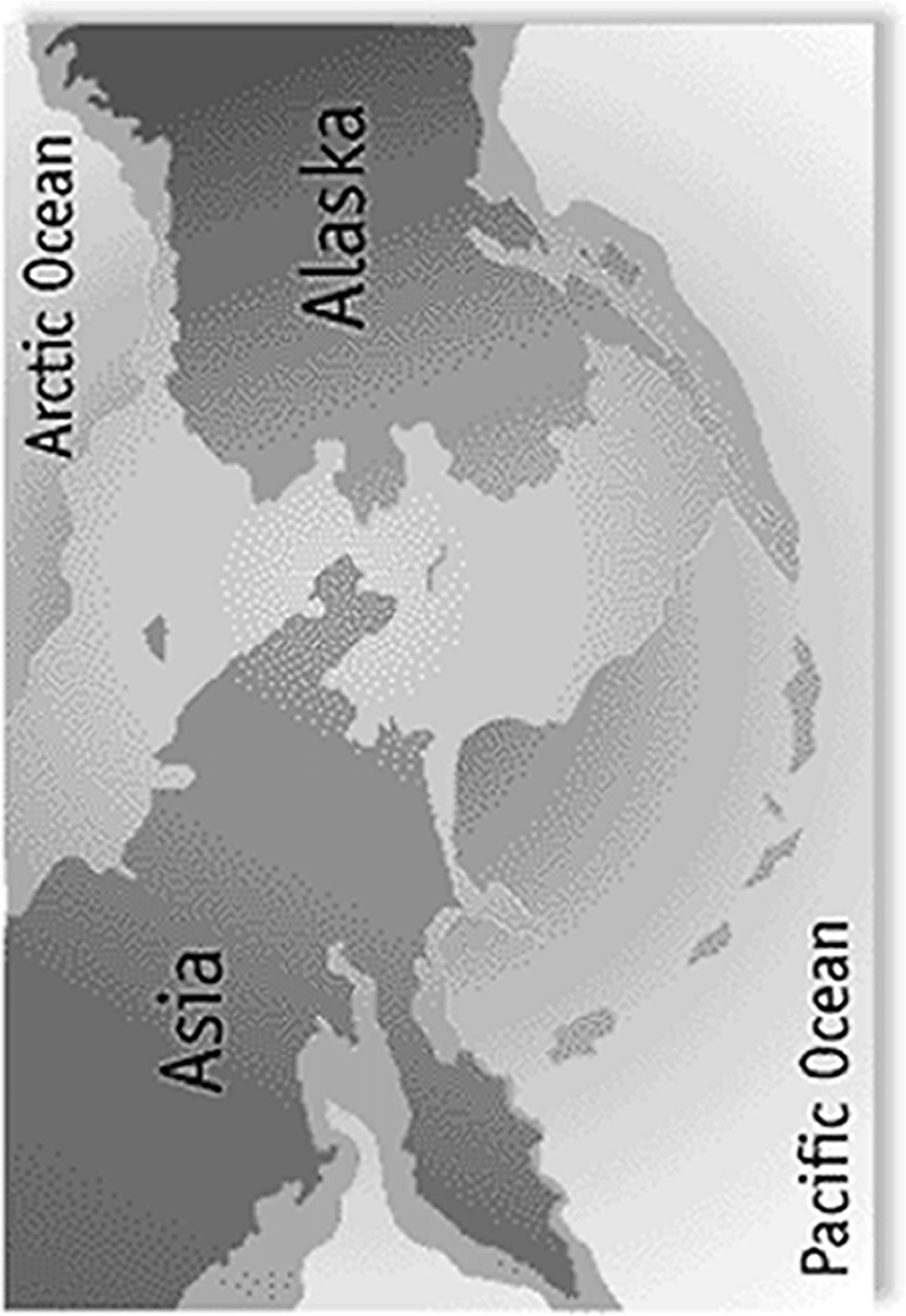
Transparency – Extent of Glaciers





Human Entrance Into the New World

Transparency – Land Bridge



Lesson Plan #9

Title of Lesson: Native American History in Pennsylvania Before The Europeans

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social studies and history

Main Concept(s): Native American history in Pennsylvania is the history of over 15,000 years of cultural change.

Objective(s): Students will be able to identify and understand the basic characteristics of Paleo-Indian, Archaic, and Woodland cultures in Pennsylvania

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies - I.a., I.d.; IIIg., IIIh.; IV.a., IV.c., IV.e.
Grade 5 Social Studies – I.a.; II.b.; III.a., III.g., III.h., III.k.; IV.b., IV.c.; V.b.
Grade 6 Social Studies – I.a., I.c., I.d.; II.b., II.d.; III.a., III.g., III.h., III.k., IV.b., IV.c., IV.e.; V.a.

Pennsylvania Department of Education (PDE):

Grade 7 History – 8.1.9 A and 8.4.9 C
Geography – 7.3.9 A and 7.3.9 B
Grade 8 History – 8.2.9 B and 8.2.9 C
Geography – 7.3.9 C and 7.3.8 D

Materials/Equipment:

*Student Text: "Native American History in Pennsylvania Before the Europeans" (Chapter 9)
*Vocabulary transparency
*Blackboard, whiteboard, and/or overhead projector
*Blank transparency, dry erase marker, and/or chalk
*Map of North America
*Map of Pennsylvania, which shows counties and adjoining states.
*Instructions for making cordage
*One piece of raffia for each student (at least 1.5 feet long)
*Clay or play dough (one or two fist sized pieces for each student)
*Popsicle stick (one for each student)

*Roll of twine (optional)
*Graphic organizer (one for each cooperative group)
*Poster board, glue, paper, and drawing materials (optional)
*Food (optional)
*Teaching trunk materials: fluted point, Archaic and Woodland points, knives scrapers, flakes, axes, adzes, celts, hammerstones, netsinkers, "Bob Moore Native American Craftsman." hide preparation video, "Memorial Park" video (to reserve a trunk contact: wolynec@edinboro.edu)

Anticipatory Set:

1. Ask students, "How long have Native American cultures lived in Pennsylvania?"

2. Ask students, "Do you know the names of some of the Native American cultures who lived in Pennsylvania?"

3. Tell students that they will learn something about the history and way of life of Native Americans who lived in Pennsylvania before the coming of the Europeans.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) This can be done through silent reading, choral reading, or you can read it with them. The assigned readings are included for your reference. Each of the following sections will indicate the necessary student readings, and a focus question to facilitate discussion and information that you, the teacher will use to clarify and elaborate on the reading material. You may want to get some Cooperative Groups working together as the students become familiar with the concepts and terminology of anthropology.

1. Student Text # 1:

> People have been living in what is now Pennsylvania for over 15,000 years. The ancestors of the earliest Native Americans in Pennsylvania may have crossed the Bering Strait Land Bridge as early as 25,000 years ago. The land bridge from northeast Asia to Alaska was open for travel from 25,000 to 10,000 years ago, during the last glaciations. Archaeologists are still looking for evidence of these early people. They are still not sure when the first people came to North America. Archaeologists do know that Pennsylvania history is at least 15,000 years long.
>
> During these 15,000 years, the people who settled this area successfully interacted with their environments, changing their way of life as the environment changed. This kind of change is called an **adaptation**. By studying archaeological sites, things found at sites, and archaeological context, archaeologists have identified three major cultural adaptations in this 15,000-year period. They do not know how many actual cultures existed here, nor do they know what the early Native Americans called themselves. Therefore, archaeologists have given names to the three major cultural periods: Paleo-Indian, Archaic, and Woodland. These same names are used by archaeologists throughout the Eastern Woodlands. Archeologists agree that the land, now called Pennsylvania, could be a good place to live because of the abundance of plant, animal, water, and mineral resources.

•On a map of North America, show the location of the Bering Strait Land Bridge with respect to Pennsylvania.

- Review the word adaptation from the vocabulary transparency.

2. Student Text #2:

> The earliest cultural period is called the **Paleo-Indian Period**. It begins when the first people traveled from Asia to North America and ends at the end of the last Ice Age, about 10,000 years ago. During the last Ice Age, glaciers covered the northern third of Pennsylvania until about 13,000 years ago. Life immediately next to the glaciers would have been very difficult. In addition to the extreme cold, very strong winds would have blown from the glaciers making life almost impossible. However, as one moved away from the glaciers, a more friendly and abundant environment was available for use by people. This Arctic environment could provide fish; migratory animals such as musk ox, mammoth, caribou, moose, and elk; in addition to a limited variety of berries. As the glaciers began to melt and move north, forests and grasslands replaced the Arctic environment. Plants and animals which preferred this new environment replaced those which preferred an Arctic environment.

- Ask the students, "How could people use the different animals found in the Arctic environment."

> **Note**: Expect answers such as meat for food, skins for clothes, sinews for rope, antlers for hammers, bones for tools, etc.

3. Student Text #3:

> Most Paleo-Indian sites in Pennsylvania have very few remains. Many include a few stone tools and pieces or flakes of stone, which resulted from the manufacture of these tools. Why are there very few plant and animal remains? There are at least three reasons. First, plant and animal remains are scarce because most of these would have decayed and disappeared. Because stone does not decay, it tends to be found at these sites. Second, the sites were often occupied for a short time by a very small number of people. Therefore, they may not have left much behind. Third, some of these sites were studied by archaeologists before they had the tools with which to discover evidence of plant and animal remains.

- Ask students, "Because Paleo-Indian sites are often very small and contain few remains, what do you think happens to the evidence of the people who lived there if somebody is treasure hunting on them today?"

> **Note**: The evidence may be completely destroyed, especially context.

- Ask students, "Do think every Paleo-Indian site is important to archaeologists?"

> **Note**: The answer is yes, because there are so few sites.

4. Student Text #4:

However, there are several sites in Pennsylvania, which provide more abundant clues. Archaeologists working at the Shoop site, in Dauphin County, have found rare evidence of blood remains on stone tools. Analysis of this blood residue has identified cervid blood. Cervids include deer, elk, moose, and caribou. Although they did not find actual bones, the presence of this blood on tools suggests to archaeologists that a variety of cervid meat was cut by the tools. At the Shawnee Minisink site, in Monroe County, archaeologists found fish bones and hackberry remains, suggesting that fishing and berry gathering were important at this site. Although there is very little evidence of food remains, archaeologists suspect that Paleo-Indian people in Pennsylvania hunted mostly small game and collected plant foods when available. Evidence of large game hunting is rare.

The most famous site in Pennsylvania is the Meadowcroft site, located in Washington County. This site may be as old as 15,000 years, making it the oldest continuously occupied site in the United States. Remains represent a series of hunting camps, which used this rock shelter for protection. These hunters probably hunted small game animals.

- Show the location of Dauphin, Monroe, Washington Counties on the Pennsylvania map.

5. Student Text #5:

Many Paleo-Indian sites in Pennsylvania are found near rivers. It is no surprise that these sites would be located along rivers. Water is a very useful resource. First, people need to drink water in order to stay alive. Second, many plants and animals live near or in the water. These would have been useful to people as food and as sources of raw materials. Third, water can be a useful tool in preparing food and in processing some raw materials such as plant fibers and animal skins. Fourth, rivers can be used as highways for easy travel from one place to another, for trading resources from one place to another. Finally, some river valleys can provide a more sheltered environment than high areas away from the valleys. Because most of the sites have very few remains, archaeologists can only make educated guesses about the importance of living along the rivers and the quality of life of these early people.

- Review the reasons why water is a very useful resource.

- Ask students, “How are rivers important to us today?”

6. Student Text #6:

Stone tools are among the most studied remains. In addition to a variety of cutting and scraping tools, archaeologists have found spear points, which they call **fluted points**. The oldest of these are called Clovis points, named after a site in New Mexico where they were first found. They are found in many parts of the United States. These spear points are longer than they are wide and are thinner in the area away from the point. This thinning is called a **flute**. Archaeologists suspect that this flute was used to attach or **haft** the stone spear to a wood or bone shaft. By experimenting with hafted fluted points which they made themselves, archaeologists suggest that they would be most useful as thrusting spears and not throwing spears. They have often been compared to a bayonet on a rifle.

- Show a fluted point from the teaching trunk.

Note: Because it is sharp, you may not want to pass it around without supervision. It may not be acceptable under "zero tolerance" for sharp objects/weapons.

7. Student Text #7:

Because fluted points are difficult to make, only certain types of stone were commonly used. Paleo-Indian people in Pennsylvania used the best quality stone they could get. Because this stone was not always available where they lived, archaeologists suggest that Paleo-Indian people often traveled to places where these types of stone were abundant. Some sources for a stone called jasper are near Allentown, in northern Virginia, and Delaware. Another useful stone called chert was found in eastern New York, western New York, and Ohio. Some archaeologists have suggested that the need for good stone to make spear points was so important, that Paleo-Indian people planned their yearly activities to include trips to the stone quarries.

- Show students the location of Allentown and the states of New York, Delaware, and Virginia on the Pennsylvania map.

8. Student Text #8:

Archaeologists suggest that overall population size was very small. However, people did not live the same way everywhere. They certainly did not stay in one place all the time. The way people move and settle over a landscape is called a **settlement pattern**. Paleo-Indian people planned their seasonal movements based on the need for food and resources such as high quality stone. For example, in southeast Pennsylvania, the sites are small and close to the jasper quarries of Pennsylvania, Virginia, and Delaware. In the center of the state, the sites are very large and near the chert quarries of New York State. In the Ohio River Valley of Western Pennsylvania, the evidence is still unclear.

There is no evidence which can tell us about the social life of Paleo-Indian people in Pennsylvania. However, by studying living hunter and gatherer groups around the world, archaeologists have learned that family life is a very important part of survival. Many hunter and gatherer groups are **patrilineal**. This means that the children of a marriage belong to the father's family and not to the mother's family. Brothers and their families might live together, while the mothers had to leave their families to live with their husbands and children. This may have been true of the earliest people in Pennsylvania.

Paleo-Indian people in Pennsylvania probably lived within groups formed of related families. Anthropologists call this kind of society a **band**. A child might live with his or her parents, brothers and sisters, and sometimes grandparents, cousins, aunts and uncles. This kind of extended family would include no more than 25 people at a time. That may not seem like many people, but think of how many plants and animals would be needed to supply the food for such a large group everyday! Each group would probably collect their own food and raw materials. Men, women, and children would all be involved in collecting food. They would share these among themselves. Sharing of food and resources would have been a very important part of their survival. Each group would also make its own tools. Occasionally, when they met with other groups for special activities such as marriage, sharing of knowledge, or other rituals, they might exchange or trade for other things they needed. The adults of the group would make the important decisions. There would be no government, only agreement among equal people after they had discussed a particular problem. This type of agreement is called **consensus**.

Life for Paleo-Indian people in Pennsylvania involved hard work every day. But, because they learned where to find important resources and how to get and use these resources, they were able to plan their activities. By planning their seasonal activities, they were able to survive not just the easier summer months, but the harder winter and early spring months. In fact, their lives probably followed a pattern of food and resource collection, movement, and social gathering year after year. However, this pattern was not exactly the same every year. As the Ice Age continued to end, changes in the environment continued to influence changes in this pattern of life.

- Review the terms settlement pattern, patrilineal, band, and consensus from the vocabulary transparency.

- Ask the students, "How is our way of life today similar or different from the Paleo-Indian cultures of Pennsylvania?"

Note: Make two columns on the board or transparency sheet and list the students' answers.

- Ask the students to brainstorm what their life may have been like if they were Paleo-Indian children.

- **Optional**: Tell each student to write a story about a day in the life of a Paleo-Indian child.

Note: Students can present this in essay form or in book form with illustrations.

9. Student Text #9:

The next cultural period defined by archaeologists is called the **Archaic Period**. It started at the end of the last glaciation, about 9,000 years ago, and continued to about 3,000 years ago.

By the time the glaciers retreated, and the last Ice Age came to an end, much of Pennsylvania was covered with forests. At first, when it was colder, spruce, pine, and hemlock trees were more common. As the climate became warmer, oak, hickory, and chestnut trees became more common. Mixed in with the forests were a variety of wetlands, rivers, and clearings. Animals such as fish, deer, rabbits, squirrels, foxes, bears, beavers, turkeys, ducks, geese, and others were abundant. Bush plants living in the clearings, were full of berries. Wetland plants produced edible seeds and fibers. Trees bore edible nuts and acorns in addition to wood. Rivers, lakes, and seashores areas were full of fish and shellfish. Pennsylvania was full of abundant useful resources. Archaeologists have discovered that Archaic people learned to use these resources very well.

Archaeologists have found a variety of food remains at sites. Burned deer bones, found in fireplaces called hearths, suggest that deer were an important source of meat. But deer were not the only sources of meat. Archaic people also hunted and trapped bear, rabbits, squirrels, birds, and rodents. Fish bones and the shells of shellfish suggest that fishing was important in some parts of Pennsylvania. Seeds from blackberries, raspberries, and wild grapes suggest that these were gathered when in season. Plant remains such as hickory nuts, walnuts, and acorns suggest these were collected in the fall. They are particularly important because they can be stored for use during the difficult winter and spring months.

Although Pennsylvania was full of useful resources, they were not the same everywhere across the state. Differences in rainfall, ground water, soil type, sunlight, temperature, growing season, altitude, and forest cover influenced what kinds of resources were available in a particular part of Pennsylvania. Food resources, in particular, were usually available during certain seasons of the

year and not others. For example, berries ripen in the summer and early fall, while hickory nuts and walnuts ripen in the late fall. Deer and turkeys may be available throughout the year. Large amounts of migratory birds such as ducks and geese may be available in the spring and fall, when the birds are flying north for the summer or south for the winter. In order to survive, Archaic people in Pennsylvania learned where and when food resources would be available during the different seasons of the year. In some parts of Pennsylvania, Archaic people had to cover a larger territory and move more often to get the resources they needed to live. In other parts, they used a smaller territory and moved less often. All Archaic people in Pennsylvania adapted to their environment by developing tools which helped them use the available resources and moved their camps whenever their needs for particular resources changed.

- Ask the students, "How did the environment change after the end of the last glaciation?"

Note: Expect answers such as the ice sheets melted, the kinds of plants and animals changed, the abundance of plants and animals changed, etc. Guide students to specific answers identified in the preceding student text.

10. Student Text #10:

Stone tools are still the most abundant tools found by archaeologists at Archaic sites. Wood and bone tools were also probably used, but most of these have decayed or dissolved in the acid soils of Pennsylvania. Stone tools were made by either chipping the stone or grinding and polishing a stone. Chipped stone tools such as spear points, knives, scrapers, and drills are common stone tools. These continue to be made from high quality stone such as chert or jasper.

These tools are made by hitting a stone with a stone, bone, or antler hammer in a planned way. Pieces of stone called flakes are removed until a particular shape and sharp or dull edge are produced. The spear points do not have flutes anymore. They either have a stem or notches in the sides for use in hafting them onto wooden shafts. Archaeologists suggest that these were thrown spears using a special tool called a spear-thrower. By using a spear-thrower, a hunter could increase the force with which a spear entered the body of an animal. The spear's point would enter the body more deeply than a spear thrown without a spear-thrower. Animals could also be trapped. Knives would be used for cutting anything that needed to be cut. Scrapers could be used to scrape fat from animal hides as they were turned into useful leather. Stone drills could make fire or make holes in skin, wood, shell, or bone.

Ground stone tools were made by pecking, grinding, and polishing a softer stone. Many woodworking tools were made in this way. These tools included axes for cutting down trees and adzes, celts, and gouges for shaping the wood. If you go to a hardware store, you will see woodworking tools made of metal that are used in a similar way to make things of wood. Wood is a wonderful resource. You can use it to build more solid houses. You can make bowls, boxes, spoons, fishing poles, and other useful items. You can burn it to make fire. You can carve a spear-thrower from wood. Although archaeologists have found very little evidence of wood, the presence of woodworking tools at sites suggests that wood was a very important resource.

Ground stone tools were also used to crack nuts, grind seeds, or grind colored rocks for use in paints or tattoos. Netsinkers are ground stone tools, which are found, at many Archaic sites. Netsinkers are flat stones which have notches on each side. They were used to sink fishing nets. A fishing net will float on the surface of the water and catch no fish. When it is weighted down with netsinkers, a net can be stretched across a river to catch many fish. Fish may have also been caught be spearing or with hooks and line.

Near the end of the Archaic Period, some people in Pennsylvania began to make stone pots. These were carved from a very soft stone called soapstone or steatite. The pots were heavy and could not be carried easily. This suggests to archaeologists that in some parts of Pennsylvania, Archaic people were able to stay in their camps for a longer amount of time. Perhaps they had all of the food they needed nearby for much of the year. Steatite is found in southeastern Pennsylvania and northeastern Maryland. Because it is found at sites in other parts of Pennsylvania, archaeologists suggest that steatite was traded across the state.

- Ask students, "How do the tools used by Archaic people different from those used by Paleo-Indian people?"

- **Optional**: Show or distribute artifacts from the teaching trunk.

  Note: The teaching trunk contains Archaic spearpoints, knives, scrapers, flakes, axes, adzes, celts, hammerstones, and netsinkers. You will need to decide if it is safe to distribute these items.

- Ask students, "What did early Native Americans use scrapers for?"

  Note: Expect answers such as scraping skins, shaving wood and bone, etc.

- **Optional**: Show video "Bob Moore Native American Craftsman."

  Note: The video shows the different steps in deer hide processing. This part has no narration. It is a wonderful opportunity for students to work in cooperative groups to discuss what he was doing. By the way, the yucky stuff in the can is deer brains which are used in the tanning process. (The second part, which shows bead embroidery, is narrated. It is interesting but not appropriate to this section.)

11. Student Text #11:

Of course, there are the many tools made of plant and animal materials, which archaeologists do not find because they have decayed. Baskets, strings and rope, nets, leather clothes and shoes, bone needles, and other tools would have been made and used by Archaic people. These are sometimes found in other parts of the Eastern Woodlands.

- Ask students, "What can you make out of a grass cord or rope?"

  Note: Expect answers such as fishing nets, belts, clothes (woven or knotted), pouches for carrying things, fishing lines, baskets, shoes, etc.

- Tell students they will make a simple rope or cord.

- Distribute one long piece of raffia to each student and then demonstrate how to make the cord.

  Note: Practice making cord using the attached instructions before you attempt to demonstrate this to the students. Allocate enough time for each student, if possible. Go from student to student to help each student out.

- Tell students that making rope or cord allowed people to socialize, have conversations, and tell stories while they were doing this task. People who practiced making cord for years, could do this almost without thinking about it. "Their fingers remembered what to do."

12. Student Text #12:

> Campsites were not the same throughout Pennsylvania. Some camps were occupied seasonally. They were occupied only during the time needed to collect a particular resource. Some of these sites are stratified. They show evidence that people returned to the site year after year during an important season. There are no substantial houses found at these sites. Some camps were found near important sources of raw materials or near good locations for getting food. In a few rare places, sites contain more permanent-looking houses and pits for storing food. These camps may have been occupied for a longer period of time. People may have left these sites to hunt and gather nearby. They may have occasionally spent a night away from camp at a temporary camp.
>
> Archaic people in Pennsylvania learned to schedule or plan their activities around the resources which were available. For example, if they knew that the fishing season was coming soon, they could make new nets and fix old nets in time to take advantage of the good fishing. When berries and nuts were available, they could spend much of their time gathering these food resources. They planned their daily activities and work around a seasonal cycle. They moved their camps as they needed to gather the food and raw materials. They hunted and gathered foods that were available seasonally. They continued to live in family-based bands. They shared their food, made their own tools, and traded for needed raw materials. Sometimes when food was abundant, one family group would meet with other family groups a form a larger temporary community. This was a time for ritual, marriage, friendship, sharing of knowledge, trade, and other social activities. By 3,000 years ago, people in Pennsylvania were ready for important changes in their way of life.

- Ask students, "What seasonal activities do you and your families participate in? Are there special tools, objects, foods, or places that are part of these activities?"

> **Note**: Expect answers such as Thanksgiving, hunting, school, hockey, football, food canning, picking strawberries, etc.; football equipment, schools, cherry pitters, turkey, etc. The answers will depend upon the background of each student and student community. Urban and rural students might have some different answers.

- **Optional**: Tell each student to write a story about a day in the life of a child who lived during the Archaic Period in Pennsylvania.

> **Note:** Students can present this in essay form or in book form with illustrations.

13. Student Text #13:

> The **Woodland Period** in Pennsylvania started 3,000 years ago and ended a little after the first Europeans came to Pennsylvania 400 years ago. It is a time of important cultural changes in the way people get their food, the tools they use, and in the way they organize their communities. Because these changes did not happen all at once, archaeologists find it useful to divide the Woodland Period into three parts: Early, Middle, and Late.
>
> Early Woodland (1,000 - 300 B. C.) Life in Pennsylvania during the Early Woodland Period was similar to the late Archaic way of life. People were still hunters and gatherers. They still planned their activities and movement around the need for certain types of foods and other resources.

They continued to hunt deer, bear, wild turkey, squirrel, raccoon, groundhog, and other animals. They collected edible roots, berries, nuts, wild seeds, and acorns. Roasted nuts, wild seeds, and acorns could be ground into flour which could then be baked into a cake or boiled with water to make a gruel. Dried meat, nuts, and acorns could be stored for use in the winter and spring. This does seem very much like the Archaic way of life. What were the differences?

One important change was the way Early Woodland people took care of some wild plants. They were still gathering wild plants for food. However, they were cultivating the soil and weeding around the seed plants, which they liked to collect in the wild. These seed plants included chenopodium (lambs quarter), amaranth (pig weed), and polygonum (knot weed). These wild plants were healthier and produced bigger seeds because people were taking care of them. After a while, some people began to collect the seeds for planting new plants and not for eating right away. This was the very beginning of what eventually became a farming way of life. Even though they were taking care of some wild plants, Early Woodland people in Pennsylvania were still hunters and gathers who got their food from wild plants and animals.

- Ask students, "What was the most important difference between the way of life of Early Woodland people and Archaic people?"

14. Student Text #14:

Early Woodland people in Pennsylvania began to make baked clay containers called pottery. These pots were very simply made with thick walls. They could have been made by pinching the clay or by smoothing out coils of clay and then baking the clay until it became as hard as stone. Pots were very useful. They could be used for storing things and for cooking food. These pots were often heavy, broke easily, and were hard to carry over long distances. The use of these important tools suggests to archaeologists that Early Woodland people did not travel from place to place as much as the Archaic people did. They began to live in small villages, composed of several families, in order to take care of their wild plant gardens. As more and more people began to live together for a longer time, ideas about social organization and their place in the world also changed.

- Distribute clay or play dough to each student.

- Have students experiment with making small pots using both pinching and coiling techniques.

Note: To make a simple pinched pot: 1. Roll the clay into a ball. 2. Stick your thumb into the middle of the ball but not all the way through. 3. Start moving the ball around in the hand while you are squeezing the thumb and fingers into the clay. To make a simple coiled pot: 1. Divide the clay into two parts (¾ and ¼ of the clay). 2. Make a small flat disc with your hands from the smaller piece of clay. 3. Make a long rope from the larger piece of clay. 4. Connect one end of the clay rope with the base and begin to coil the clay rope so that it forms walls. 5. Smooth out the coils.

Note: There are several varieties of clay which eventually harden. These might be more transportable by students than permanently soft clay.

Note: This may be a great way to get your art teacher involved. Most art teachers are familiar with simple pinched and coiled pot manufacture.

15. Student Text #15:

In western Pennsylvania, along the Ohio and Monongahela Rivers, archaeologists have found evidence of an Early Woodland culture, which they named Adena. Evidence of the Adena culture is found in Indiana, Ohio, Kentucky, and West Virginia. Adena people are different from other Early Woodland people in Pennsylvania because they built large cemetery mounds. Not everyone was buried the same way. The bodies of some people were burned (cremated). The bodies of others were left out in the open, so that after a time only the bones remained. These ashes and bones were then buried in the mounds. Still others were buried in specially prepared stone or log tombs in the middle of the mounds. Sometimes burials included grave goods, or objects, which were buried with the dead. These objects included stone tools, carved stone smoking pipes in the shape of animals and people, and carved stone jewelry. Archaeologists suggest that differences in burial and grave goods provide evidence that not everyone who lived in Adena culture was equal to everyone else. Some people may have been more important than others when they were alive. This suggests that people no longer live in a band level society. Because they spent a lot of energy and time burying their dead, Adena people must have believed that this was important. Some archaeologists have suggested that the Adena people practiced a religion, which involved special treatment of their ancestors.

- Show the Ohio and Monongahela Rivers on the map of Pennsylvania.

- Ask students, "Can we look at the things that people own to learn something about them?"

Note: Lead the discussion to things such as special items of clothing with identifiable labels, buying cars not because they work but because someone is trying to convey a special image, etc.

16. Student Text #16:

Middle Woodland (300 B. C. - A. D. 900) In most parts of Pennsylvania, the life of Middle Woodland people was similar to the Early Woodland people. People were still hunters and gatherers who kept small gardens and lived in small villages. Pottery was still important. But as people learned more about pottery-making, they made pottery that was harder and had thinner walls. It was also more decorated. Archaeologists call this pottery, cord-marked pottery. While the clay was still soft, the surface of each pot was hit with a paddle, which was covered by a rope or cord. This left marks on the surface of the clay in the shape of the rope or cord. The clay pot was then baked so that the pot became hard as a stone. By studying some of these marks, archaeologists have discovered how the cord was manufactured.

- Repeat the pottery making activity but tell students to make their pottery walls thinner.

- Wrap the cordage made previously (or new cordage) around a flat stick such as a Popsicle stick.

Note: If no student-made cordage is available, use a ready made twine to wrap the stick.

- Use this wrapped cord to press the design of the cord into the soft clay.

17. Student Text #17:

In western Pennsylvania, Adena culture continues until it is replaced by a new culture which archaeologists call Hopewell. Hopewell people lived throughout the Midwest but especially in Illinois, Indiana, and Ohio. Hopewell people also buried their dead with special grave goods. The raw materials of these objects often came from many parts of the continent. Mica from the Carolinas, obsidian from northwest Wyoming, copper from the Lake Superior region, fresh water pearls, and precious metals and stones all found their way into burials in the form of carved figurines, tools, and jewelry. Evidence of Hopewell people has been found in the Allegheny Valley of Pennsylvania. Archaeologists have discovered small villages, burial mounds, and grave goods similar to those found in Hopewell sites in Ohio.

- Repeat the sources of raw materials by showing them on the map of North America.
- Show the Allegheny Valley, Illinois, Indiana, and Ohio.

18. Student Text #18:

Late Woodland (A. D. 900-1,600) Changes in tools and food brought about changes in the lives of Late Woodland people. First, the bow and arrow was introduced. For thousands of years, Pennsylvania hunters used spears and spear-throwers to kill game animals. Although these were very good hunting tools, the bow and arrow was better because game could be killed a much greater distance from the hunter. People continued to hunt deer, bear, wild turkey, and other animals. Small triangular stone arrow points are found at many Late Woodland sites.

The second major change was the introduction of corn, beans, and squash. These very nutritious foods could be farmed by people. By increasing the food supply, Late Woodland people in Pennsylvania were able to feed many more people than in the past. Villages became larger and more permanent. Some villages were carefully planned and organized. Archaeologists have discovered evidence of oval houses made of bent saplings and covered by hides or bark near the center of some villages. These were surrounded by smaller buildings made of the same materials in the shape of a keyhole. Not surprisingly, archaeologists call them keyhole structures. The people who lived there probably used the buildings in the center of the village as houses. The keyhole-shaped buildings may have been used for smoking meat or as ritual sweathouses. A wall or stockade of large wood posts surrounds all of these buildings. This stockade may have been built to protect the people of the village at times of war.

Archaeologists find evidence of many more different cultural groups than from the past during the Late Woodland. For example, they have found evidence of three different Late Woodland groups in central Pennsylvania along the Susquehanna River. They have called these cultures Clemson Island, Shenks Ferry, and Susquehannocks. In western Pennsylvania they have discovered evidence of a culture called the Monongahela culture. These sites are found along the Monongahela and Ohio Rivers. Each of these cultures was a farming culture which also hunted and gathered for food. The people of each lived in villages made up of buildings used for different purposes. Some were surrounded by walls called palisades; others such as the Clemson Island were not. House shapes could be oval or long.

The last and perhaps most important cultural change came when the Europeans arrived in Pennsylvania. Warfare increased. Many Native Americans died from diseases such as smallpox, measles, and the flu. Others died from warfare and starvation. Most lost their lands to the Europeans. Some groups moved away, some stayed, while others became extinct.

- Ask the students, “What were the major cultural changes during the Late Woodland?”

- Write the answers on the board or overhead transparency.

- **Optional**: Tell each student to write a story about a day in the life of a child who lived during the Woodland Period in Pennsylvania.

> **Note**: Students can present this in essay form or in book form with illustrations.

Closure:

1. Tell the students that for 15,000 years, Native Americans in Pennsylvania were able to survive the worst and the best environments because they learned to use what their environments provided for them. When the Europeans came, the Native American continued to change.

2. **Option 1**: Invite an archaeologist to class in order to discuss their work in the archaeology of Pennsylvania Native Americans.

3. **Option 2**: Take the students on a field trip to a major museum which has displays and dioramas associated with the archaeological Native American cultures of Pennsylvania.

4. **Option 3**: Have each student pick one of the three cultural periods discussed in this unit and do library and/or Internet research about it. The results should be presented in a formal written report.

5. **Option 4**: Show video "Memorial Park: Preserving the Past."

Assignment:

1. Divide students into cooperative groups (4-5 students per group).

2. Have each group fill out the Graphic Organizer using the information found in their readings.

3. Have each group create a poster based on the graphic organizer.

> **Note**: The poster can use words as well as pictures. Hang these around the room for all to share.
> **Alternative**: Have the class create a huge graphic organizer (using large butcher paper) and share the results with the rest of the school.

4. Have each group create a menu of foods for each cultural period and compare it to their own foods. They can develop this menu using words and/or pictures.

5. **Optional**: Have an actual feast in the class using some of the various menu items.

> **Note**: Of course, student allergies, religious preferences, etc. may impact what you can choose for food. But there is such a large selection of possibilities, that you should be able to provide a

variety of foods. Nothing is exotic. Everything is available in some form in the supermarket. Perhaps the cafeteria staff might enjoy getting involved in the process.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials and artifacts can be assembled in a student/group portfolio. A vocabulary list and content terminology can also be assessed through objective means.

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

Fagan, Brian M. *Ancient North America: The Archaeology of a Continent*, 2nd Edition. Thames and Hudson, 1995.

Kent, Barry C. *Discovering Pennsylvania's Archaeological Heritage*, Revised Edition. The Pennsylvania Historical and Museum Commission, 1994.

Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. Chapter 16, "Experimental Archaeology: Making Cordage." In *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades.* United States Department of the Interior, Bureau of Land Management, 1993.

Wolynec, Renata B., et al. *Project Archaeology: Pennsylvania – An Archaeology Curriculum for Middle School Grades Five Through Eight*. Pennsylvania Archaeological Council, 1995.

NATIVE AMERICAN CULTURES GRAPHIC ORGANIZER

Queries	Paleoindian	Archaic	Woodland
Family and Social Life			
Climate			
Vegetation			
Tools			
Food			
Resources			
Hunting and Fishing			

Transparency - Vocabulary

Lesson 9 – Vocabulary

A cultural **adaptation** happens when people change their way of life as the environment changes.

Fluted points are spear points, which are longer than they are wide, and are thinner in the area away from the point.

This thinning is called a **flute**.

To **haft** means to attach the stone spear to a wood or bone shaft.

The way people move and settle over a landscape is called a **settlement pattern**.

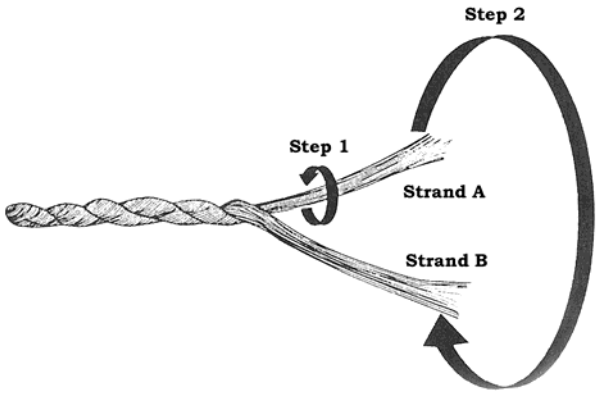
In a **patrilineal** family the children of a marriage belong to the father's family and not to the mother's family.

A **band** is a society made up of related families, which may include as few as 25 people living together at one time.

Agreement among equal people after they had discussed a particular problem is called **consensus**.

Instructions for Making Cordage (Excerpted from Lesson Sixteen, *Intrigue of the Past*, Page 83)

- Hold one end of Strand A and one end of Strand B together, side-by-side, in your left hand between your forefinger and thumb (if right-handed, *vice-versa* if left-handed). Pick up Strand A between your right forefinger and thumb, and twirl the strand away from your body (clockwise), Step 1 on figure.



- Take the twisted Strand A and bring it toward your body, over Strand B, Step 2 on figure. Strand A and Strand B have now reversed positions.

- Hold strands A and B between your left forefinger and thumb about where you crossed A over B. Repeat the twirling and crossing sequence: pick up Strand B, twirl it away from your body, and cross it over Strand A. Strand B and Strand A have now reversed positions.

- Continue these steps. The twirling in one direction and crossing over in another direction forms an interlocking pattern like that of machine-made rope. Left-handed people will reverse the directions of twirling and crossing. They twirl the strands toward their bodies, and cross the strands under, then over.

IF YOU HAVE PROBLEMS DOING THIS, PLEASE TELEPHONE (814)732-2570 FOR AN ON THE TELEPHONE TUTORIAL FROM DR. WOLYNEC. PLEASE HAVE YOUR STRANDS WITH YOU WHEN YOU TELEPHONE.

SECTION THREE – COMPARING CULTURES

Lesson Plan #10

Title of Lesson: What Basic Needs Do All Cultures Meet?

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social studies and anthropology

Skills Addressed: Reading, verbal and written communication, research, and cooperation

Main Concept(s): All people in all cultures must meet basic needs

Objective(s): Students will learn that all cultures, no matter how different from each other, must meet similar survival needs.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies – I.a., I.c., I.d.; IV.e.
Grade 5 Social Studies – I.a., IV.e.
Grade 6 Social Studies – I.a., IV.f .

Pennsylvania Department of Education (PDE):

Grade 7 History – 8.1.9.A
Geography – 7.3.9 B
Grade 8 History – 8.2.9 C
Geography – 7.3.9 D

Materials/Equipment:

*Student Text: "What Basic Needs Do All Cultures Meet?" (Chapter 10)
*Blackboard, whiteboard, and/or overhead projector
*Blank transparency, dry erase marker, and/or erasable marker
*Basic Needs Chart (for each cooperative group)
*Library or Internet access
*Poster paper and drawing materials

Anticipatory Set:

1. Ask students, "What basic survival needs does your culture provide for?"

> **Note:** Expect answers such as food, water, clothing, housing, marriage, family, education, religion, philosophy, and science, among others.

2. Write their answers on the board or overhead transparency.

> **Note:** Do not erase the answers. You will use them again.

3. Ask students, "Are these needs the same or different in other cultures?"

> **Note:** Let students brainstorm regarding this answer. Some may say that they are different because they are focusing on specific cultural answers to meeting the needs and not the needs themselves. Others will say they are the same because they are taking the broader view.

4. Tell students that how the needs are satisfied may be different from culture to culture. However, the needs are the same from culture to culture.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) This can be done through silent reading, choral reading, or you can read it with them. The assigned readings are included for your reference. Each of the following sections will indicate the necessary student readings, and a focus question to facilitate discussion and information that you, the teacher will use to clarify and elaborate on the reading material. You may want to get some Cooperative Groups working together as the students become familiar with the concepts and terminology.

1. Have students read the "What Basic Needs Do All Cultures Meet?" in their student text.

- **Complete Student Text:**

> Sometimes when we look at people around the world we notice how different they are from us. They may have different clothes, houses, religions, foods, languages, educational systems, governments, and ideas. You may be surprised to discover that people everywhere in the world, living in the past, present, and future are alike in one very important way. All people must meet certain needs in order to stay alive or survive.
>
> All people need food, water, and air to keep their bodies and minds working. They need basic nourishment to keep their bodies alive. Therefore, not only do they need a certain amount of food (quantity), but also the right kinds of food (quality). Many of you already know about the "food pyramid," developed by the American scientists as a guide to healthy eating. Some of you take vitamins and minerals to be sure you get all of the nutrients you need. In other cultures, all nutrition must come from food only, because no food supplements are available. Not all cultures are able to provide all of the necessary nutrition, which our scientists tell us, is important for healthy bodies. Some cultures provide all of the food they need, while other cultures trade or buy food from others in order to add to the food, which they produce themselves.

Food can be produced in a number of ways: hunting, gathering, farming, gardening, and trade. Not everyone agrees what is good food. We may think that chickens and ducks are useful foods. In some East African cultures such as the Nuer, eating duck was considered disgusting. We may prefer low fat foods. Eskimos of the past would enjoy eating seal blubber, which is pure fat, in addition to the seal meat. Clean water and air are also an important part of everyone's survival. Polluted water or air can cause many different kinds of health problems. No matter what choices are made, all people must have food, water, and air to survive.

All people need to protect themselves from the weather. The clothes we wear and the houses we live in provide protection from the weather. Clothes can be used to keep us warm or cool. In a very cold climate, people need ways to keep themselves warm. They may use layers of clothing, a campfire, a furnace, or an insulated house. In a very hot climate, people need to keep themselves cool. They may use their clothes or no clothes, an insulated or well-ventilated house, natural shade or air-conditioning to keep cool. A hat may be useful on either a sunny hot day or a rainy cold day. Of course, the kind of hat we would use might be different each day. In some cultures people make their clothes from the raw materials they gather from nature such as animal skins and plants. In other cultures, people buy clothes, which are made in factories, often from man-made materials.

People build their houses from the materials that are available to them. Houses can be built of wood, stone, dirt, baked or hardened clay, ice blocks, animal skins, animal bones, or other materials. Sometimes, people use natural shelters such as caves or rock shelters. Although the materials and physical appearance of clothes and houses may be different, the need is the same. People need to protect themselves from the weather.

All people need to be part of a culture and society. A society is a group of people who live in a particular territory, often speak the same language, and interact to meet their basic needs. The culture provides the rules for this interaction. It defines the manners or rules for a civil society. Values, beliefs, family life, education, technology, and more are defined by each culture. The clothes you wear, the games you play and how you play them, the houses you live in, the tools you use, the kind of job you might want to have are all learned by each of us from the people who share our culture. Every culture defines what a family is. Yet, in some cultures a child calls all of her mother's sisters by the word "mother."

In some cultures, children learn how to do things by working side by side with adults. In other cultures, children learn by going to a school such as yours. Yet, in both situations, the children are learning what they need to be active and useful members of their society.

All people need to explain the world around them and their place in the world. Religion, philosophy, and science are ways in which people in different cultures try to understand and explain their world. We all experience the sun, stars, plants, animals, minerals, weather, disease, birth, and death. Yet, how we explain our world and what happens to us in this world depends on how our culture defines our world. For some people, a sickness can be explained by an insect bite or a bacterial infection. For other people it may be the result of a punishment because of something they did to someone.

In our culture, today, we know that an eclipse of the sun is a natural event involving the passing of the moon between the earth and the sun. In some cultures, including many cultures of the past (including ancient European cultures), that same eclipse of the sun was considered a message that something important or dangerous was about to happen. What we know about our world is defined by what our culture teaches us to be true. Not all cultures define and explain the world the same way. Yet, all cultures do provide such descriptions and explanations.

All people need to communicate. People communicate using spoken language, symbols, and body language. Anthropologists estimate that there have been over 2,000 spoken languages in the

history of the world. Some communication is in the form of symbols. These can include written languages and visual images in the form of abstract or realistic pictures. Body language includes facial expression, gestures, posture, and distance from a speaker. All of these are used to communicate the wants, needs, ideas, history, and interactions of people in a particular culture. People in every culture use combinations of these forms of communication to express themselves. Not every culture has developed a writing system. Yet every culture has developed a communication system which is useful to the people of that culture.

Every culture in the world tries to meet the basic needs of its people. Archaeologists have learned that all cultures in the past also met human needs. Evidence of food, shelter, clothing, religion, social organization, and communication is found in the things archaeologists find at sites. The following three chapters will examine some of things that archaeologists have learned about three cultures from the past by focusing on symbolic communication.

2. Ask students, "What basic needs were discussed in the reading?"

3. Review the basic needs discussed in the student text and compare them against the list, which was created by the class during the "Anticipatory Set."

Closure:

1. Tell students that cultures that existed in the past also had to meet basic needs in order to survive.

2. Ask students, "What kinds of evidence can archaeologists look for to discover how past cultures met their survival needs?"

Note: Ask students to be as specific as possible in giving their answers. If they have read previous chapters, they should be able to provide the answer.

Assignment:

1. Divide students into cooperative groups (4-5 students per group).

2. Distribute the Basic Needs Chart, one for each group.

3. Ask students to select four basic needs with which to examine three cultures. The first group will be the culture of the students today; the second group will be the culture of Pennsylvania's early European settlers; the third group will be any culture in the world, ancient or modern.

Note: Make sure to approve the third culture for each group so that there is no overlap.

4. Have students research information about the needs of the settlers and the third culture using the library or the Internet.

5. Have students use the Basic Needs Chart as their guide.

6. Have each group produce a poster showing in pictures and/or words the ways that the three cultures meet the needs identified in the needs column of the Basic Needs Chart.

7. Display these posters in the classroom, library, or as part of a world cultures week celebration.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials can be assembled in a student/group portfolio. Compare the answers generated in the "Anticipatory Set" with the discussion in "Closure." Success of the lesson can be ascertained by an improved quality of the discussion in "Closure."

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

www.saa.org Society for American Archaeology

www.aaanet.org American Anthropological Association

www.archnet.asu.edu/archnet/ Anthropology Resources on the Internet

Carol R., Melvin Ember, and Peter N. Peregrine. *Anthropology*, 10th edition. Prentice Hall, 2002.

Scupin, Raymond and Christopher R. DeCorse. *Anthropology: A Global Perspective*, 4th edition. Prentice Hall, 2001.

Lesson adapted from: Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades* (Chapter 2) United States Department of the Interior, Bureau of Land Management, 1993.

Basic Needs Chart

Basic Needs	Today in USA	Pennsylvania Settlers	Third Culture

Lesson Plan #11

Title of Lesson: Written in Stone: Pre-European Rock Art in Pennsylvania

Grade Level(s): 4, 5, 6, 7, and 8

Content Areas(s): Social studies, communication, art

Skills Addressed: Reading, verbal and written communication, cooperation, critical thinking

Main Concept: Rock art in Pennsylvania is a complex of communication systems.

Objective(s): Students will be able to understand the different types of uses for rock art in Pennsylvania.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies – I.a., I.c., I.d.; II.c., II.d.; III.g.
Grade 5 Social Studies – I.a., I.c.; III.g., III.h.
Grade 6 Social Studies – I.a., I.c.; III.g., III.h.

Pennsylvania Department of Education (PDE):

Grade 7 History – 8.1.9.B and 8.1.9 C
Geography – 7.3.9 B
Grade 8 History - 8.2.9 B
Geography – 7.3.9 C

Materials/Equipment:

*Student Text: "Written in Stone: Pre-European Rock Art in Pennsylvania" (Chapter 11)
*One copy of Ojibway Scrolls and SW PA Petroglyphs (one for each cooperative group)
*Petroglyph Panel (one for each student)
*4 inch square paper (one for each student)
*Ruler (one for each student)
*pencil (one for each student)
*large drawing surface (one for each cooperative group)
*crayons or coloring tools

Anticipatory Set:

1. Tell students that they will be learning about rock art in Pennsylvania.

2. Ask students, "What is rock art?"

Note: Expect answers such as communications, art, etc.

3. Ask students, "What can rock art be used to communicate?"

Note: Let students brainstorm the answers to this question.

4. Tell students that rock art can be used to communicate anything people might want to communicate.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) This can be done through silent reading, choral reading, or you can read it with them.

1. Have students read the "Written in Stone: Pre-European Rock Art in Pennsylvania."

- **Complete Student Text:**

Introduction "The rock I wanted to show you is just ahead, Mr. Cadzow". The boatman carefully guided the wooden dory through the shallows while archaeologist Don Cadzow strained to see through the thick fog on the chilly Susquehanna. It was the Fall of 1928, and the Pennsylvania Historical Commission had sent Cadzow to the lower Susquehanna Valley to investigate a report from some local residents of strange marks on some of the mid-river rocks near the little town of Washington Boro, just above the great rapids at Safe Harbor. Suddenly a large gray shape loomed up in the fog, and the boatman expertly swung the dory into an eddy below the huge rock. Cadzow and his guide clambered up on the dark boulder, and the guide led the way to a spot where a cluster of faint, shallow grooves were barely visible on the surface. The guide dipped his hat into the river.

"They show up better when they're wet" he said, and emptied the hat onto the rock. Cadzow's eyes opened wide in amazement as a human face, a turkey track, a spiral, and a variety of other strange and fanciful shapes leapt from the rock, thrown into sharp relief by the hat full of water. Over the next several hours, as they continued their exploration of the boulder and other nearby rocks, dozens of mysterious shapes revealed themselves, some so old and worn that they looked like they could have been pecked into the rocks thousands of years ago.

"My grandpa discovered them many years ago, Mr. Cadzow. He used to say it was the Indians who put them on the rocks back in the old days. I've always wondered what they mean. Do you suppose it's some kind of writing?" Cadzow climbed back in the boat and scratched his chin "I don't know exactly what they mean, but I do know they're an attempt to communicate." The boatman pushed off into the river, and Cadzow sat down in the bow of the boat, turning around to talk to the boatman, "I sure would like to talk to the people who made them!"

Kinds and Locations of Rock Art There are two basic kinds of Native American rock art; petroglyphs and pictographs. Petroglyphs, a kind of sculpture, are pecked or chiseled into the surface of a rock, using another, harder rock to do the work. Pictographs, which are more common in the western United States, are actually rock paintings done with natural pigments like walnut hulls (for a rich brown color) and iron oxide, a mineral sometimes referred to as ochre (for reds

and yellows). Pennsylvania's rock art sites are almost all petroglyphs, probably due to our damp climate. Pictographs fade and disappear relatively quickly unless they are applied in a very dry and sheltered place.

There is currently no reliable way to assign a date to most rock art sites. **Radiocarbon dating**, a technique that measures the rate of radioactive carbon decay in samples of organic (or formerly living) remains like charcoal or bone, won't work on rock. Unless the pictograph or petroglyph contains an image of something of a known age, like horses or guns which appeared in the 1600's in Pennsylvania, we simply have no way to tell how old most rock art sites are. In some cases they may date back thousands of years. This also means we have no idea what groups of Native Americans made them. While we're certain **prehistoric** people (that is, people who lived here before the Europeans arrived) had spoken languages and names for themselves just as we do, they do not appear to have had complex written languages beyond the symbols they painted and chipped on rocks. Since we have no translation for these symbols, and since some of them may be very old, we simply have no idea what groups of people or individuals made them.

Pennsylvania's petroglyphs are found in a wide variety of settings and rock types in many parts of the state. There are whole panels of petroglyphs found on mid-river and riverside boulders such as the famous Safe Harbor petroglyphs investigated by Don Cadzow and the Indian God Rock petroglyphs on the upper Allegheny river in western Pennsylvania. More common are the dozens of smaller groups of petroglyphs, or even single figures, pecked into smaller rocks and boulders scattered in many out of the way places. In all cases, the petroglyphs are a mix of easily recognized subjects (animals and animal tracks, human hand prints, and faces), abstract or geometric shapes (spirals, curves, lines), and very strange and fanciful figures (half-bird/half-human figures, deer/human figures). As long ago as the 1700s, European Americans have marveled at these works of art left by their Native American predecessors, and tried to guess their age, their origin, and most importantly, their meaning.

The Meaning of Rock Art As Cadzow guessed, petroglyphs are clearly an attempt to communicate. The real question is: Exactly *what* is being communicated? Currently, there are several competing theories about the meaning of Pennsylvania rock art. Some archaeologists believe they are **boundary markers**, signposts that mark the borders of tribal territories and warn or welcome visitors. The prominent riverside petroglyphs like those at Safe Harbor or the Indian God Rock are cited as examples of such boundary markers. They would have been visible to anyone traveling on or along the major rivers, a clear and obvious message for those who understood the symbols. The problem with this theory is not all petroglyphs are, or were, obviously visible. For a boundary marker to be effective, it must be visible.

Another theory for the meaning of petroglyphs has been proposed. Some modern Native American tribes have a tradition of **teaching rocks**. These petroglyphs and pictographs are locations used by tribal elders to educate young people. The symbols tell ancient stories of the history, beliefs, and values of the tribe, and youngsters are taken to the rocks, which are often carefully hidden, where the stories are passed along to them by the elders. The rocks are hidden from view, because a student must be judged mature enough to accept and understand the stories before they are passed along. Teaching rocks are something like the written history and code of conduct of the tribe, and are considered very important and sacred places. Perhaps Pennsylvania's petroglyphs are the teaching rocks of tribes that formerly lived in what's now the Commonwealth. Of course, that leaves us with the problem of the large, prominent and visible riverside petroglyphs. If teaching rocks are supposed to be kept hidden, then these large petroglyphs don't really fit the model.

Some archaeologists think that rock art sites are an attempt to communicate not with other people, but with the supernatural. Based on observations made of 20th Century Stone Age people in Australia and southern Africa, some archaeologists believe petroglyphs could be examples of **hunting magic**. According to this theory, prehistoric hunters may have inscribed the figures on the rocks during the course of certain rituals intended to provide the hunter with good luck in the

search for wild game. Many of the figures inscribed as petroglyphs in Pennsylvania are game animals such as deer or turkeys. If this model is correct, then the petroglyphs are places for hunters to pray for good fortune in the search for food. Of course, many petroglyph figures are not game animals, and the social structures, hunting and gathering methods, and other aspects of the cultures of Native Australians and Southern Africans are very different from those of Native Americans. We have no guarantee that the Australian and African practice of hunting magic was also practiced in North America.

Of course, it's always possible that all the theories are correct. The large and highly visible petroglyphs may be boundary markers while the smaller, more hidden examples might be teaching rocks. All or some of the petroglyphs may be hunting magic sites. And of course, there may be other theories that better explain Pennsylvania's petroglyphs, theories that will come from young researchers with a new and fresh way of seeing the prehistoric world, perhaps even from you!

2. Review words from the vocabulary transparency.

3. Ask students, "What do archaeologists think rock art was used for in Pennsylvania?"

Note: Students should be able to cite the different types of explanations using their student text. Expect answers such as communication, tell stories, expression of beliefs and values, teaching rocks, hunting magic, spiritual expression, boundary markers, etc.

4. Ask students, "Do we include art or symbolic images for the purposes of communication in our culture?"

Note: Expect answers such as to sell things, for fun, to identify somebody's manufactured item such as a logo, etc.

5. Divide students into cooperative groups (4-5 students per group).

6. Distribute one copy of Ojibway Scrolls and SW PA Petroglyphs to each group.

7. Tell students that Ojibway birch bark scrolls are used like teaching rocks, to instruct young tribal members in the traditions of the tribe.

Note: This exercise is drawn from the research of Rex Weeks, a Doctoral candidate in archaeology at the University of Arizona and a member of the Cherokee tribe.

8. Have each group match similar images between the two sets of images.

9. Ask students, "Do you think that the teaching rocks theory is a good idea or not?"

Note: Use this exercise to start a discussion of the teaching rocks theory.

10. Ask students, "What do you think our classroom would be like if we used teaching rocks?"

Closure:

1. Distribute a copy of the Petroglyph Panel to each student.

> **Note**: A cooperative group could work on the panel from steps 2 – 5.

2. Have each student draw a grid of one inch by one inch squares over the entire drawing.

> **Note:** Assign a label to each grid unit. A, B, C, D, etc. will be fine.

3. Assign a grid unit to each student.

4. Using a measured four inch by four inch square on paper, have every student attempt to make a copy of the image within their square in the appropriate size.

5. Put the individual units together at the end of the exercise and see how close they come to the original.

> **Note:** The production of scale drawings is one of the most important skills of archaeology, and this is precisely how real petroglyph panels are recorded.

Assignment:

1. Divide students into cooperative groups (4-5 students each).

2. Have each group compose a simple message or phrase, then translate it into a glyph or symbol using simple, easily recognized figures (no letters or numbers) sketched on a large sheet of paper, a black or white board, or some other large surface.

3. Bring the class back together and allow each group to translate the others' messages.

4. Have each student write an essay focusing on how they think written languages evolved, including the concept of shared symbols within a culture. Have them address the question, "Would a student from Germany, China, or South Africa be able to translate the class's coded message as well as an American student? Why or why not?"

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials can be assembled in a student/group portfolio.

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

www.saa.org Society for American Archaeology

www.aaanet.org American Anthropological Association

www.public.asu.edu/~rexweeks Eastern States Rock Art Research Association

Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades.* United States Department of the Interior, Bureau of Land Management, 1993.

Transparency – Vocabulary

Petroglyphs are images or sculptures which are pecked, carved, or chiseled into the surface of a rock, using another harder rock to do the work.

Pictographs are rock paintings done with natural pigments like walnut hulls (for a rich brown color) and iron oxide.

Ochre is a name given to iron oxide (reds and yellows).

Radiocarbon dating is a dating technique that measures the rate of radioactive carbon decay in samples of organic (or formerly living) remains like charcoal or bone.

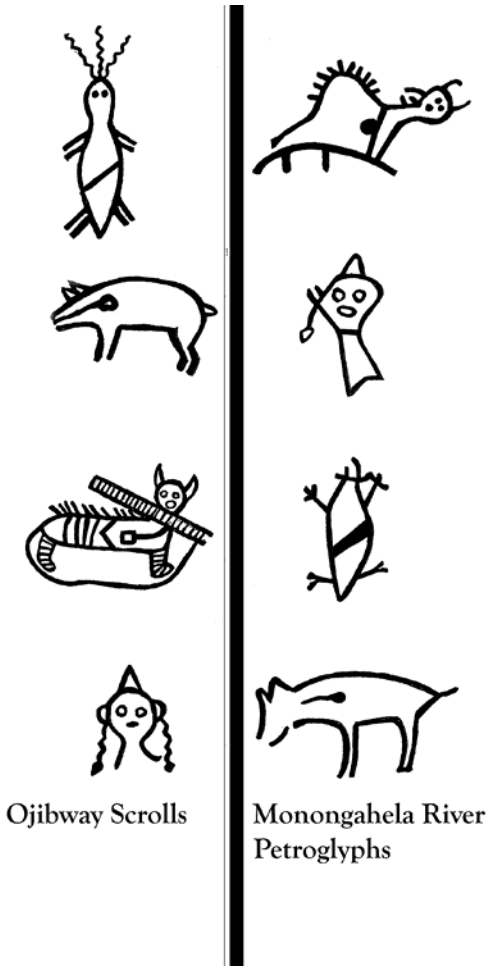
In Pennsylvania, **prehistoric** refers to the people who lived here before the coming of the Europeans. In other parts of this book, it defines the time, occupied by people, before writing was invented.

Boundary markers were used to mark the borders of tribal territories and warn or welcome visitors.

Teaching rocks are petroglyphs and pictographs which are used to educate young people. The symbols tell ancient stories of the history, beliefs, and values of the society.

Hunting magic was used by some hunters during rituals intended to provide them with good luck in the search for wild game.

Ojibway Scrolls and SW PA Petroglyphs



Petroglyph Panel

Lesson Plan#12

Title of Lesson: Ancient Egyptian Hieroglyphics

Grade Level: 4, 5, 6, and 7

Content Area(s): Social studies (philology)

Sills Addressed: Reading comprehension, writing, oral communication, critical thinking, and drawing

Main Concept(s): Writing reflects cultural values, developed from symbolic representations of things found in the environment. Writing was critical to the functioning of a state level society, was practiced by an elite group of people, and the documents produced help archaeologists reconstruct the past.

Objective: The students will use critical thinking skills to analyze an ancient language and will be able to see the similarities and differences to our language. They will understand that written primary sources help us reconstruct an ancient civilization but we cannot always believe what is written in a text just because it is old. The students will be able to understand why a written language was necessary in a state level society. The students will learn the social and gender qualifications for becoming a scribe.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies – I.a., I.c.; II.c., II.d., II.e.; IV.e.; V.a., V.b.
Grade 5 Social Studies – I.a., I.c., II.d.; IV.c., IV.e.; V.a., V.b.
Grade 6 Social Studies – I.a., I.c.; II.d.; IV.c., IV.e.; V.a., V.b.

Pennsylvania Department of Education (PDE):

Grade 7 History - 8.1.9 A, 8.1.9 C, and 8.4.9 B

Materials/Equipment:

*Student Text: "Ancient Egyptian Hieroglyphics" (Chapter 12)
*Blackboard, whiteboard, and/or overhead projector
*Blank transparency, dry erase marker, and/or chalk
*A large piece of cardboard for each cooperative group making a palette
*Black sharpie for each student
*Assorted colored sharpies for students to use if they wish
*Broken pieces of terracotta flowerpots
*Black poster paint
*One small paintbrush for each student

*Two small paper, styrofoam, or plastic cups for each student – one for paint and one for water
*Protective covers for tables (newspapers)
*Transparency of Egyptian Logograms
*Transparency Uniliteral Signs
*Transparency Biliteral and Triliteral Signs
*Transparency Egyptian Numbers
*Name Matching Exercise
*Number Matching Exercise
*Transparency text in hieroglyphic and hieratic for students to copy or one copy for each student

Anticipatory Set:

1. Tell the students that they will be learning about ancient Egyptian hieroglyphics and the scribes who wrote the language.

2. Explain that scribes were people who were trained to read and write. Tell the students that in ancient Egypt only a small number of people, usually male, were trained to be scribes.

3. Explain that scribes came from the elite or upper class in Egyptian society.

4. Tell the students that there were families of scribes and the profession was usually passed from father to son.

5. Go around the room and ask each student, "What do you think ancient Egyptian scribes wrote about?"

6. Write their answers on the board. If a student has nothing to say, allow them to say "pass."

7. Brainstorm as a class about other things that Egyptian scribes might have written about.

> **Note**: This could include literary texts, legal texts, medical texts, tax documents, household accounts, trade documents (relationship through trade with other countries), political documents (the Pharaoh and his or her affairs), a record of warfare, religious texts (temple accounts), etc.

8. Ask students, "How would you compare these kinds of written documents to what we write in our society?"

9. Ask students, "Why do you think it is important to be able to read Egyptian hieroglyphics?"

10. Ask students, "How can Egyptian texts help archaeologists reconstruct Egyptian civilization?"

11. Ask students, "Do you think we can believe everything that an ancient Egyptian scribe wrote? Why or why not?"

12. Explain to the students that some scribes might have been prejudiced and they might not have told the truth about everything.

    Note: The Egyptian pharaoh Rameses II had his scribes write that he won every battle that he ever fought but we know from other sources that that isn't the truth.

13. Tell the students that archaeology can help determine if texts are accurate or not.

    Note: If a text tells us that a pharaoh, as a living god, lived a long healthy life and then archaeologists [Egyptologists] find the pharaoh's mummy and discover he died young and had many ailments, it is obvious that the written document was wrong.

14. Explain that written documents can add to an archaeologist's knowledge.

    Note: If an Egyptologist uncovers lots of pottery from Crete in an Egyptian tomb, he or she would speculate that the Egyptians of that period had trade relations with Crete. If they then found documents listing all of the trade items that came into Egypt from Crete it would corroborate the archaeological evidence. Archaeologists would be certain that Egypt traded with Crete and that the artifacts found in the tomb were not just imported by one person.

Procedure:

- For the next part of the lesson, the students must read the material in the Student Text. (make sure each student has a copy) This can be done through silent reading, choral reading, or you can read it with them. The assigned readings are included for your reference. Each of the following sections will indicate the necessary student readings, a focus question to facilitate discussion and information that you, the teacher, will use to clarify and elaborate on the reading material. You may wasn't to get some Cooperative Groups working together as the students become more familiar with the concepts and terminology of the lesson.

- After they read the text, have the students answer the questions that follow. They can write the answers individually or in groups. If they answer the questions in groups, the students can select a member of their group to present their answers to the class. If you don't want them to write the answers, the whole class can discuss the questions and answers orally. In this case, you can write the students' answers on the board or on an overhead transparency. Whatever method you choose, you need to discuss the answers as a class and come to some conclusions

1. Student Text #1:

The Girl Who Wanted to Be a Scribe Every day Meres-ankh watched her father prepare the tools of his trade before he went to work. Nebamun was a scribe (a writer of documents) who worked in the tax collection office in Thebes, the Egyptian capital. Meres-ankh loved to look at the beautiful lumps of black and red pigment that her father carefully ground with a small stone mortar and pestle. Sometimes he would let her grind the pigment for ink and mix it with water and gum (gum Arabic). She knew that the black ink was made from the carbon that the servants scraped from the bottom of cooking pots. She saw old Heria remove the pots from the fire after she prepared the family's meal and scrap the black soot from the bottom. Then Heria presented it to her father as if it was a necklace of pure gold. Her father always smiled at the old servant and told her that she did a very good job. Meres-ankh was told that the red pigment she ground was a mineral called red ochre but she wasn't sure where her father got it. It must have come from the

colorful market in Thebes, where merchants sold things from all over Egypt and from foreign lands.

After Meres-ankh ground and mixed the pigment she poured it into two round depressions in her father's square wooden palette. She knew that the pigment would dry into two solid lumps, one red and one black. Her father would then dip his brush in a small pot of water that he carried and rub it on one of the cakes of ink. When he stroked his brush on a piece of pottery or papyrus, he made the most beautiful signs. Meres-ankh longed to reproduce the birds, animals, and household objects that her father drew or the equally beautiful curved black lines of his cursive script.

Her father's brushes were made of reeds or rushes that grew in the marshes in northern Egypt so they had to come by boat down the Nile to Thebes. Her father never let her chew the end of the rush to make it into a fine bristled brush because it was important for him to get just the right edge on his brush. He was also very careful about cleaning his brushes and putting them back in the long narrow depression in the center of his palette after he used them.

Nebamun would pick up his palette containing his brushes and cakes of ink and his water pot and small sticks of sandstone, which he used as erasers and he would hurry off to work. Meres-ankh was always sad to see him leave. He was not the only one to leave home each day. Meres-ankh's two older brothers also ran out of the house each morning. They went to the House of Life where they were learning to be scribes. The House of Life was a school attached to one of the Egyptian temples. When they were gone, Meres-ankh moped about the house. She was tired of playing with her dolls and she didn't have anyone to play senet with. Her father had given her a senet game (a board game similar to chess) because he knew she was intelligent and needed something to stimulate her. Her mother was too busy running the household to play senet with her and her father and brothers were gone. What could poor Meres-ankh do? You couldn't ask servants to play a game with you.

One day Meres-ankh had a wonderful idea. She had been playing with a ball in the courtyard when a servant tripped and broke a large water jar. The servant knew her mistress would be very angry and Meres-ankh told her that she would hide the pieces of the jar in her room. She told the servant not to say anything and her mother would never know about the accident.

Meres-ankh was very happy that she now had something to write on. She would try to draw signs on the pieces of pottery and become a scribe like her father and brothers. She already knew how to grind pigment for ink and she had watched her father make brushes. It was her dream to learn how to write the beautiful signs. She had asked her father if she could go to the House of Life with her brothers but he only laughed at her. He explained that girls never went to school because it was their job to marry and raise children not to learn how to write. So Meres-ankh decided that she would learn how to write in secret.

Late at night Meres-ankh would sneak out of bed and go to her brothers' room. She would take their school assignments to the courtyard and by the light of the moon she would carefully copy them on the pieces of broken water jug. Students and scribes used pieces of broken pottery (called ostracon or plural ostraca) as paper in ancient Egypt. Papyrus was very expensive and was only used for important documents. Meres-ankh worked and worked and would rub out her mistakes with a wet cloth. Then she returned her brothers' school assignments to their room and got into her own bed at dawn. She could often be seen napping during the day and all of the servants wondered why she was so tired. Heria also wondered why there wasn't as much soot on the bottoms of her cooking pots.

One night Meres-ankh was so tired that she forgot an ostracon as she gathered up her writing instruments and staggered off to bed. In the morning her father found the ostracon and smiled broadly. Meres-ankh saw him pick up the ostracon and she hung her head in shame. What would her father think of her? But Nebamun called his sons into the courtyard and asked which one had completed the ostracon. He said that it was the finest piece of writing he had ever seen. The boys both shook their heads and said that they hadn't written the ostracon.

Nebamun was confused until he looked at his daughter. "Did you write the signs on this ostracon Meres-ankh?" "Yes, father. I am very sorry but the writing was so beautiful and it was my dream to create such a beautiful thing." Her father said: "Meres-ankh it is obvious that the great god of the scribes, Thoth , spoke to you in your dreams. He has given you greater talent than either of your brothers. You can already draw the signs and now I will teach you to read and write the language."

Each day when Nebamun returned from work he gave his daughter a lesson. Meres-ankh learned that the language was a lot more than just copying signs. Her father taught her that there were sentences with nouns, verbs, pronouns, adjectives and other parts of speech. Her told her that in hieroglyphics the verb always comes first in a sentence and the verb is followed by a subject. Meres-ankh first learned to write in hieratic, the cursive form of the language. Students always learned hieratic first before they learned to draw hieroglyphs. Hieratic was a much easier script to learn.

Meres-ankh was indeed blessed by the god Thoth because she became an accomplished scribe. Although she could never work in the Pharaoh's offices like her father and brothers, she taught other women how to write. When she grew up and married another member of the nobility, she managed her husband's estates while he was away working for the Pharaoh. People would come from great distances to ask her to write letters for them because she could write the symbols so beautifully. Meres-ankh's dream had come true. Even in ancient Egypt, if a person wanted to do something that was unusual and they tried hard enough, they could accomplish their goal.

- Ask the students the following questions:

  a. What did the story tell you about the ancient Egyptian language?

  b. What did you learn about the profession of scribe in ancient Egypt?

  c. Members of which class and gender became scribes in ancient Egypt?

  d. You learned how to read and write in school. Where did the Egyptians learn to read and write?

  e. If an archaeologist excavated the house of an ancient Egyptian scribe, what would he or she find? Make a list of the artifacts that might have remained. Remember that Egypt has a very dry climate and many fragile things have been preserved.

  f. Since only the upper class could write, do you think we get only the upper class view of society? Give an example of what an upper class view might be.

  g. Do you think we get only the male view of society? How do you think a male view of a culture would differ from a female view of a culture? Do you think men and women have different viewpoints today? Give an example.

  h. Can archaeology help us learn what men who were not in the upper class and women were doing in ancient Egypt? Give a specific example.

2. Student Text #2:

Writing in Ancient Egypt Archaeologists have found written documents on many sites in ancient Egypt. Documents found in official state archives are usually written on papyrus (paper made from a plant) and documents found in villages, such as the tomb worker's village of Deir el Medina, are usually written on ostraca (pieces of broken pottery-potsherds). These documents tell Egyptologists a lot about ancient Egyptian culture. Archaeologists have also excavated tombs that contain painted scenes of daily life in ancient Egypt. So there are at least three sources of information about ancient Egypt:

A. archaeology,

B. written documents,

C. tomb paintings.

Writing in ancient Egypt started as a series of symbols. The Egyptians drew a picture of an object that they wanted to talk about. These objects were things that they saw in everyday life. A picture of a bird's head would mean bird and a picture of a ceramic container like the ones in which the Egyptians stored beer would mean a jug of beer. This type of sign is called a logogram and it is the oldest form of hieroglyph. Eventually these picture signs were given a phonetic value or sound value. So that the picture of a foot no longer meant foot, it had the sound value of the B like the B in our alphabet. The symbol for foot could then appear in lots of Egyptian words with the phonetic (sound) value of B ( ).

- Divide students into cooperative groups (4-5 students per group).

Note: Students may work independently if cooperative groups are not feasible or desirable.

- Review the logograms in the student text using the transparency.

- Tell each group (or student) to look at objects in their environment and think how they might create a logogram.

- Assist students by telling them, "Try to communicate a simple idea using your symbolic language. For instance, if you drew a pair of legs it could indicate walking. Draw the sun and it could indicate the sun or daylight. A picture of a woman, a pair of legs walking, and the picture of a house might mean that a woman is walking to her house." In the earliest form of hieroglyphics this it what the hieroglyphs for that sentence would look like:

Note: Draw the symbols on the board or overhead projector as you explain.

- Have a representative from each group (or several individual students) come to the board, draw a logogram they thought up, and indicate what word it stood for.

- Have the students write sentences on the board using the logograms they created.

Note: Make sure that all of the students understand that once you create a logogram, you must use that same sign every time you write that word. If you draw a simple table to mean table, every time you use the word table in a sentence, it must be exactly the same simple table sign that you first drew. Your sign for table can't be drawn differently each time.

- Tell students to save their logograms for the next section.

3. Student Text #3:

> **Egyptian Palettes** Before the first Pharaoh ruled in Egypt (c. 3100 BCE), the ancient Egyptians used stone palettes, like an artist's palette today, to grind the paint they used for eye makeup. Both men and women wore eye paint. These stone palettes took many different shapes including the shapes of fish and animals. They always had a depression in the center where eye paint was ground. A palette might look like the one below:
>
> Eventually the Egyptians started carving symbols on these palettes to record important events that happened. Archaeologists excavated a palette that contained pictures of many different animals carved in the stone. They called it the hunter's palette and it is thought that it either tells the story of a very successful hunt or it is the wish for a successful hunt in the future.
>
> The most important palette that archaeologists found is called the Narmer Palette and it records the union of Upper (southern) and Lower (northern) Egypt by a king from southern Egypt called Narmer. Narmer became the first Pharaoh of the first Egyptian dynasty. On this palette, the Egyptians used true hieroglyphic signs. This is our earliest evidence for phonetic hieroglyphic signs. There is a fish with the phonetic value n'r (nar) and a chisel with the phonetic value mr (mer). The picture of a fish no longer means fish and the picture of a chisel no longer means chisel. These two pictures have now been given sound values and together they spell the name of Narmer ( ) .

- Have the students work individually or in cooperative groups.
- Give each student or group a piece of cardboard so that they can draw a palette.
- Give each student a black sharpie to draw their palette and logograms.

> **Note:** Have color sharpies available for students if they want to use them.

- Tell students or distribute printed instructions for making a palette: On a large piece of cardboard, draw an interesting shape for your palette. It could have the shape of a fish or an animal. Try to tell a story on the palette using the symbols you invented in the previous exercise. Think of an event that might take place. The event should depict Egyptian culture. It could be a grain harvest, the baking of bread or brewing of beer. You could be telling the tale of a Pharaoh conquering his enemies, a trading expedition etc. Remember, you are not drawing a picture of the event. You are using symbols to tell the story. If you are telling the story of an Egyptian grain harvest, you might have a picture of a man, a picture of a knife (representing cutting) and a picture of a stock of wheat. Your sentence would read: The man is cutting or harvesting the wheat. Since this is symbolic writing rather than drawing, every time you use your symbol for man, it must look exactly the same as your previous drawing of a man. You also need to make your palette attractive. Arrange your symbols so that they communicate a meaning to us and look artistic on the palette. The ancient Egyptians hated empty spaces and when they wrote on tomb walls, they often added symbols just to fill unsightly spaces.

- After the students or groups of students have completed their palettes, have them exchange their palette with another student or another group.
- Each student should try to decipher the meaning of another student's palette. If the students are working in groups, each group should try to decipher the meaning of another group's palette.

- If the students are working in groups, have a representative from each group come to the front of the class and explain the meaning of the logograms on their palette to the class.

- If the students are working individually, you should ask for several volunteers to come to the front of the class and explain their logograms.

- Tell the students to turn-in their palettes for assessment. If they are working individually, they can keep their palettes for a portfolio of all their work in the Egyptian unit.

- Show the transparency of Egyptian Logograms to the class or have the students look at their text copy while you review the material.

4. Student Text #4:

> **Symbols, Signs and Alphabets** The ancient Egyptians did not use an alphabet. The alphabet was invented much later by the Phoenicians, a people living along the coast of what is today Lebanon and Israel. The Greeks learned about the alphabet from the Phoenicians and after that alphabets were used to write European languages. The ancient Egyptians used some symbols more often than others but they had hundreds of symbols or signs in their language. The following uniliteral sign list represents the most common signs used for writing words in hieroglyphics. In this sign list one sign is equal to one sound or phoneme. Remember the foot that had the sound value of B. You will find it in the uniliteral sign list. The Egyptians used some sounds that we don't find in English. Many of these sounds are found in modern Middle Eastern languages like Hebrew and Arabic.

- Show the transparency of the Uniliteral Sign List (correct spelling <u>not unilateral</u>) and review its contents with the class or have the students look at their text while you review the material.

- Tell the class that there is no L sound in Egyptian hieroglyphics.

- Point out the signs that have the same phonetic value as signs in our alphabet.

- Point out some of the sounds that do not exist in the English language.

- Discuss with the students what an alphabet is.

> **<u>Note</u>**: Look at our alphabet and tell the students that we use the same 26 letters or signs for every word that we write. The ancient Egyptians had some signs that they used more frequently than others (the uniliteral signs) but they had hundreds of signs that they could use.

5. Student Text #5:

> **More Egyptian Signs and Sounds** In addition to the uniliteral signs, Egyptians had signs that represented two sounds. See the single signs below that represented two phonetic sounds.
>
> There were also single signs that represented three phonetic sounds. See the single sounds below that represented three phonetic sounds.

Egyptians did not write any vowels but they must have had vowels in their language so they could speak it. Since we don't know what the vowels were, we don't know what ancient Egyptian actually sounded like. This makes it impossible for you to write your names in hieroglyphics. People who write their name in hieroglyphics just invent symbols for the vowels or they use those sounds that are found in Hebrew and Arabic and change them into English vowels. This is just making up symbols to represent sounds. This gives people the wrong impression of what the language was like.

- Tell the students to study the two sign lists.

- Show the transparency of the biliteral and triliteral signs or draw some of them on the board and sound them out.

Note: Make sure the students understand that each sign has the sound value of two or three consonants. For instance the sign nfr has the sound value of all three consonants – the n, the f, and the r, and can be pronounced nefer. This one sign can be used for the word nefer which means beautiful.

- Tell the students that Egyptologists put an e vowel between consonants so they can pronounce the word.

- Explain to the students that the trilateral sign nfr is used in the name of the beautiful Egyptian queen Nefertiti.

Note: Most of the students have probably heard of Nefertiti. Her name means "the beautiful one has come."

6. Student Text #6:

Egyptian Numbers The Egyptians used numbers for many things. They used numbers for measuring their fields, taking inventories, calculating taxes, and building temples, tombs, and houses. Just like ours, their counting system was based on the number 10. But instead of using a different symbol for the numbers 1 to 9, the Egyptians had one hieroglyph for 1, one for 10, one for 100, etc. They did not have the 0, which made some calculations very difficult. The symbols they used for numbers are shown below.

- Show the Egyptian Number transparency and review its contents with the class or have each students look at their text copy while you review the materials.

7. Student Text #7:

How to be an Egyptian Scribe Now you know a lot about ancient Egyptian hieroglyphics. A few more points and you will be ready to write in hieroglyphics or hieratic. Hieratic is the cursive form of hieroglyphics. Hieroglyphics is like our printing and hieratic is like our cursive handwriting. When scribes wrote on tomb walls, they used hieroglyphics just as we use printing on tombstones. When they wrote on papyrus or pottery, they used hieratic just as we use cursive handwriting on paper because we can write faster in the cursive form.

Hieroglyphics can be written from left to right or from right to left or in columns from top to bottom. The question is how do you know in which direction to read? You read into the face of the signs. Since we have seen that the Egyptians took their sign designs from nature, they had many signs that represented the different birds that are native to Egypt. They also had other animals and even people signs. When a scribe wrote in hieroglyphics, all of the signs faced the same direction. So when you read hieroglyphics, it is easy to determine the direction in which you read.

Another problem with reading hieroglyphics is that there is no punctuation. You don't know where one sentence ends and another begins. It is often difficult to know where one word ends and another begins. However, sometimes the Egyptians put signs known as determinatives at the end of words and this helps to determine where the word ends, and it helps to determine the meaning of the word. Determinatives are those old logograms but now they have no sound value. They are tacked onto the end of a word to help with the meaning but they were not pronounced. For instance, the sun sign would be put at the end of a word that meant sun, day, daylight etc. The symbol for a man would be placed at the end of a man's name and the symbol for a woman would be placed at the end of a woman's name. Now it is time for you to practice you hieroglyphic and hieratic hand.

- Tell students to remember the story they read about the girl in ancient Egypt who wanted to be a scribe. Now it is their turn to try to copy hieratic and hieroglyphic script on pieces of pottery.

- Ask students, "Do you remember what an ostracon is?"

Note: Students and scribes used pieces of broken pottery (called ostracon or plural ostraca) as paper in ancient Egypt. Papyrus was very expensive and was only used for important documents.

- Tell the students that they are in training to be scribes. They will copy the hieroglyphic text (found in their book) on a broken piece of pottery (ostracon). They will copy the same text in hieratic (found in their book) under the hieroglyphic text.

Note: You can make copies of the texts for distribution to each student. This may save the books from paint spills. You should also cover the desk tops with protective covers.

- Give each student a piece of a terracotta flowerpot or have them bring a piece of a broken flowerpot from home.

- Give each student two small paper, styrofoam, or plastic cups (one for water and one for black paint).

- Give each student a small paint brush, black poster paint, and water.

- Instruct students to copy the hieroglyphic and hieratic texts on their piece of pottery.

- Ask students, "Do you think it was difficult to be a scribe in ancient Egypt?"

- Tell them that they now had the experience of how difficult it was just to draw the signs.

8. Student Text #8:

Ancient Egyptian Scribe Training Ancient Egyptian scribes trained in the House of Life (per-ankh in hieroglyphics -). The House of Life was a school that was usually associated with an Egyptian temple and was part of the temple precinct. Only men could study in the House of Life to become scribes. These men were members of the Upper Class.

That doesn't mean that all women were illiterate. There is evidence that some women could read and write hieroglyphics. They were either taught by tutors in their home or they were taught by their fathers or brothers. All male professionals, such as doctors, learned to write first in the House of Life. We know that there were women doctors in ancient Egypt and they must have learned to write at home. There is a text in which one woman is called the "Chief of Physicians". After

learning to write, doctors became apprentices to already established doctors and went with them to visit patients.

If a scribe wrote a royal inscription, he would put a cartouche around the name of the pharaoh or his chief wife. The cartouche is a circle around a royal name. So if you see a cartouche in an inscription, you know it is a royal text. In the following line of text, you see a cartouche.

Use your uniliteral sign list to read the name of the Pharaoh. (Hint: the rabbit sign is the same a the quail chick). Who is this 5th Dynasty Pharaoh?

- Have students sound out the name of the Pharaoh from the uniliteral sign list.

- Have students research the library or Internet to discover who this 5th Dynasty Pharaoh may have been.

- Have students compare the answer they developed from the uniliteral sign list with their research.

9. Student Text #9:

The Scribes Equipment consisted of the following:

Papyrus

Ancient Egyptian scribes used papyrus for important documents. Papyrus, which is a plant belonging to the sedge family, grew in the Nile Delta in northern Egypt. The stems of this plant are 7ft. to 10 ft. in length and 1 1/2 inches in diameter. They have a tough outer rind and an inner cellular pith.

In order to make the papyrus plant into paper, the stem was cut longitudinally into thick slices and the outer rind was peeled off. The succulent pithy strips were placed on an absorbent cloth on a table. They were placed parallel to each other and slightly overlapping one another. Additional strips were placed across them at a right angle. This design was covered with a cloth and beaten with a stone or wooden mallet. This material was then placed in a small press overnight. The strips of succulent papyrus would adhere to each other and once they were pressed together, they looked like woven fabric. After the papyrus paper dried, it was ready for the scribe to write on it.

Brushes:

Archaeologists have found many ancient Egyptian brushes that were used by scribes to paint hieroglyphics or hieratic on Papyrus. The brushes were made of vegetable fiber but they were preserved in Egypt's dry climate. The fibers (rushes or reeds) were chewed at one end until they separated to form bristles. (The Anasazi did the same thing with yucca fiber brushes. Although they didn't have a written language, they used the brushes to paint symbols on pottery).

Pigments:

Egyptian scribes used only black and red ink. Black ink was normally used to write on papyrus or on ostraca (broken pieces of pottery) and red ink was used for headings or a statement that the scribe wanted to emphasize. The ink was in the form of small cakes of solid material similar to our watercolors. It was made by mixing finely ground pigment with gum Arabic and water and then letting it dry. The pigment for black ink was carbon and it was obtained by scrapping it off the bottom of cooking pots. Red ochre, a naturally occurring mineral, was used for red pigment.

Erasers:

The Egyptians used wet rags or sticks of sandstone to erase mistakes.

Palettes:

The ancient Egyptian scribes palette was rectangular in shape and provided with depressions for cakes of red and black ink. It also had a recess for holding pens. The palettes could be made from a variety of materials including ivory, wood, wood covered with gold, alabaster, sandstone and schist. The hieroglyph for scribe is a picture of one of these palettes with the brushes in a holder on the side.

Painting on tomb walls:

Egyptian paintings are tempera paintings, not oil paintings. Tempera is a mixture of water, pigment and some adhesive (gelatin, glue or gum). The Egyptians used albumin (the whites of eggs) to bind paint. The paintings were then coated with beeswax to preserve them. As pigments, they used soot from the bottom of cooking pots, red and yellow ochre, azurite, malachite, and blue and green frits.

- After the students read the material, ask them to go back and reread the story about the girl who wanted to be a scribe.

- Ask students, "Do you now know a lot more about the ancient Egyptian language and the profession of scribe after reading all of the material about language in ancient Egypt?"

Note: Students should say yes. Although it is predictable that most will say yes, the question does set the stage for further discussion of what they learned.

- Ask students, "What are the main points you learned about hieroglyphics and about the profession of scribe in ancient Egypt?"

- List the main points under the headings "Hieroglyphics" and "Scribes" on the board or overhead transparency.

Note: This will reinforce the students knowledge.

Closure:

1. Have the students complete Student Activities 1-3:

Activity #1 Hieroglyphics

- Distribute the Name Matching Exercise to each student.

- Tell students, "Now that you are familiar with some of the hieroglyphic signs, see if you can match the names in hieroglyphics with the their meaning. These are actually names that were used in ancient Egypt. The Egyptians did not write any vowels but they must have had vowels in their language so they could speak it. Since we don't know what the vowels were, we don't know what ancient Egyptian actually sounded like. Egyptologists insert vowels (usually an e vowel) so they can pronounce the words. You will see that vowels have been inserted into the names that you are matching.

- Have students attempt to match the hieroglyphics with the names.

Note: Students should use uniliteral, biliteral and triliteral pages from the student text as their key. They should not be expected to have memorized these.

Note: Because the answers are not obvious, some students may have a difficult time and quit. Working in cooperative groups may then be a better option so that students can reinforce each other in their attempts.

Answer key: 1-C, 2-E, 3-A, 4-D, 5-D, 6-F

Activity #2 Egyptian Numbers

- Tell students, "The Egyptian counting system was based on the number 10, just like ours. But instead of using a different symbol for the numbers 1 to 9, the Egyptians had one hieroglyph for 1, one for 10, one for 100, etc. They did not have the 0, which made some calculations very difficult."

- Distribute the Number Matching Exercise to each student.

- Go over A in the exercise with the class.

Note: 1,000 + 400 + 90 + 2 = 1,492

- Tell students, "From the following list of numbers in hieroglyphics, translate the hieroglyphs into our number system."

- Have students complete the number writing exercise.

Note: Have students use the Egyptian Numbers page from the student text as their key.

Note: Because the answers are not obvious, some students may have a difficult time and quit. Working in cooperative groups may then be a better option so that students can reinforce each other in their attempts.

Answer key: A - 1,492; B – 365; C – 5,280; D – 1,120,239; E – 129; F – 63; G – 1,200; H – 308; I – 54,700

- Go over the correct answers as a class. Each student can assess how he or she did.

Note: Go over each answer step by step by writing on the board or transparency each group of numbers and adding them together to get the final number. Don't do this in your head. Some children need to see the process to understand it.

- You can have the students turn-in these exercises (name matching and number writing) or you can tell them to keep the exercises for their portfolio. They should try to figure out what they did wrong.

Activity #3: In Training To Be a Scribe

- Tell students they will pretend to be a scribe in training.

- Distribute broken pottery piece, two small disposable cups for water and paint, black poster paint, water, and one brush for each student.

- Distribute a copy of the hieroglyphic text and hieratic text sheet.

- Tell students to copy the hieroglyphic text on a broken piece of pottery (ostracon).
- Tell students to copy the same text in hieratic under the hieroglyphic text.
- Ask students, "How did it feel to write both of these texts?"

> **Note**: Give students an opportunity to express their emotions, frustrations, etc. on conducting this exercise. This is an excellent opportunity for the students to speculate about how much practice and training would have been necessary to be a good scribe.

2. **Optional**: Tell the students to write their own story about an Egyptian scribe.

> **Note**: The students can tell the story from the viewpoint of the ancient Egyptian scribe or a student can be an archaeologist excavating a House of Life where scribes trained. Their story should be creative but it should contain facts that they learned in this unit. They can write this in essay form or create a small illustrated book for their story.

Student Evaluation:

Tell the students that they should each create a portfolio containing all of the exercises that they completed in this unit. Evaluate the students on the quality of their portfolio, participation in all activities, and participation in class discussions.

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

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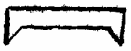
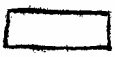
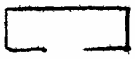
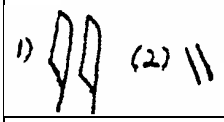
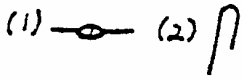
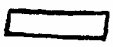
EGYPTIAN LOGOGRAMS

Man	
Woman	
Eye	
Ear	
Tree	
Sky	
Sun	
Stone	
Copper	
Desert	
Town	
House	
Knife	
Hoe	
Cup	

Uniliteral Signs

Sign	Transliteration	Sign	Transliteration
	3		ḥ
	i		ḫ
	y		ẖ
	(		s
	w		š
	b		ḳ
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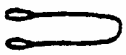
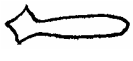
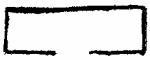
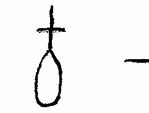
	n		ṯ
	r		d
	h		ḏ

BILITERAL SIGNS

 — bꜣ	 — ms
 — ꜥꜣ	 — Pr
 — Kꜣ	 — ỉr

TRILITERAL SIGNS

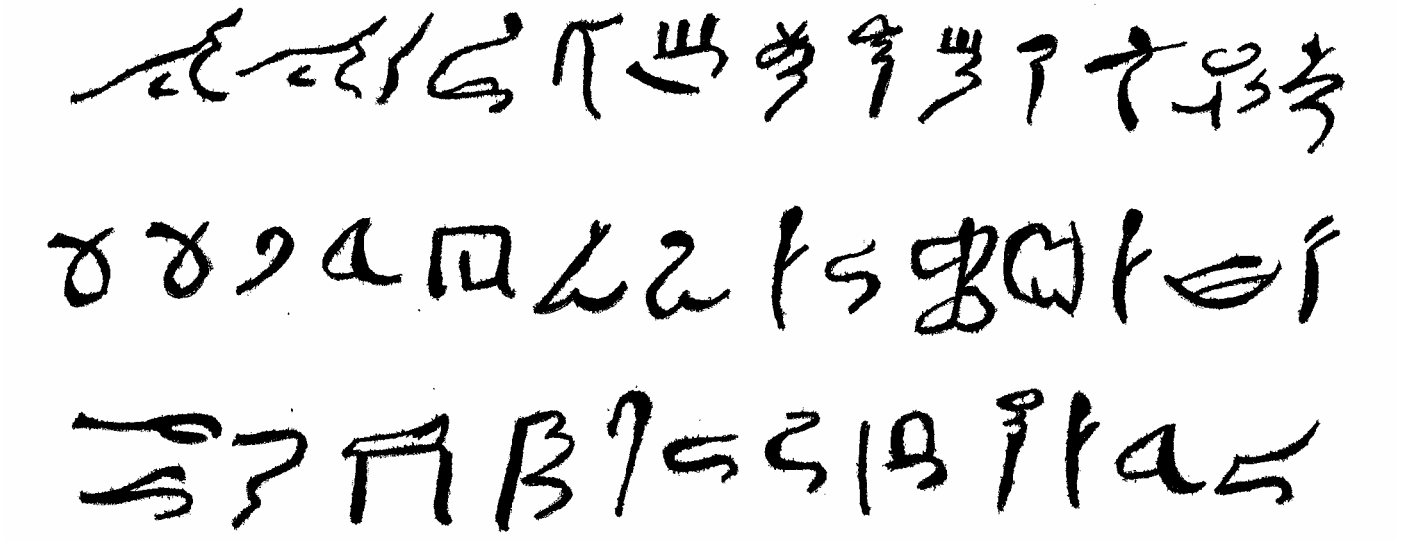
 — nfr	 — sḏm
 — ꜥnḫ	 — ꜥḥꜥ
 — ḥtp	 — ḫpr

Egyptian Numbers

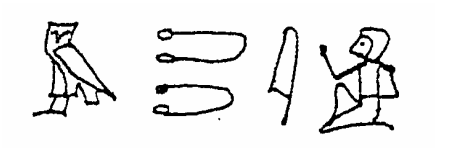
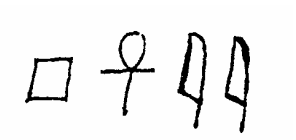
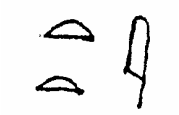
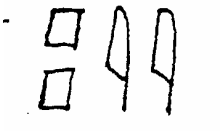
Numbers	Hieroglyph	Represents
1		Stroke
10		Cattle hobble
100		Coil of rope
1,000		Lotus plant
10,000		Finger
100,000		Tadpole
1,00,000		God holding up the sky

Hieroglyphics

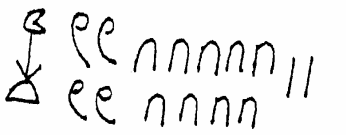
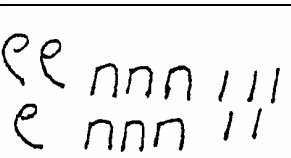
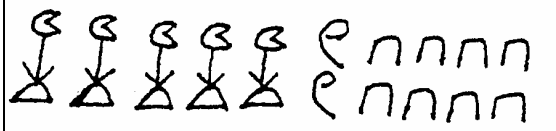
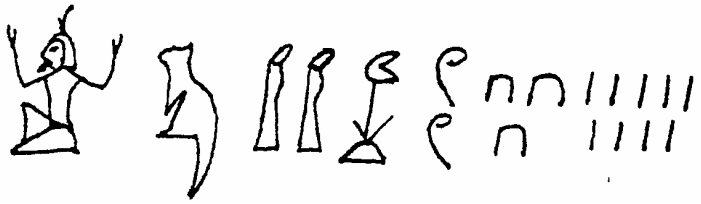
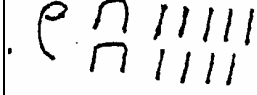
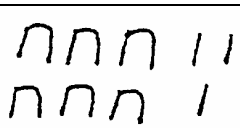
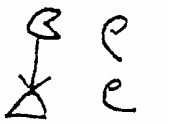
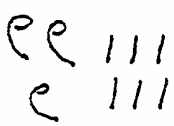
Hieratic (Cursive Script)



Egyptian Names - Matching

1		**A**	Nofret (woman's name)
2		**B**	Teti
3		**C**	Mechechi (man's name)
4		**D**	Pepy
5		**E**	Piankhy
6		**F**	Neferhotep

Egyptian Numbers - Matching

A	
B	
C	
D	
E	
F	
G	
H	
I	

Lesson Plan #13

Title of Lesson: Who are the Maya?

Grade Level(s): 4, 5, 6, and 7

Content Area(s): Social studies and anthropology

Skills Addressed: Reading comprehension, writing, oral communication, critical thinking, and cooperation

Main Concept/Big Idea: Many different native peoples lived in the Americas before European colonists arrived. The Maya in Central America were different in some ways from the people in Pennsylvania and similar in other ways.

Objective: Students will be able to describe ancient Maya culture and compare it with Native American cultures in Pennsylvania that date to the same time period.

Standards Addressed (see Appendix A)::

National Council for the Social Studies (NCSS):

Grade 4 Social Studies – I.a., I.c.; II.c., II.d., II.e.; IV.e.; V.a., V.b.
Grade 5 Social Studies – I.a., I.c., II.d.; IV.c., IV.e.; V.a., V.b.
Grade 6 Social Studies – I.a., I.c.; II.d.; IV.c., IV.e.; V.a., V.b.

Pennsylvania Department of Education (PDE):

Grade 7 History - 8.1.9 A, 8.1.9 C, and 8.4.9 B

Materials/Equipment:

*Student Text: "Who are the Maya?" (Chapter 13)
*Blackboard, whiteboard, and/or overhead projector
*Transparency blank, dry erase marker, and or chalk
*Map of North and Central America
*Transparency showing location of Maya sites
*Transparency of Stela 22
*Tropical forest transparencies
*CD of pictures of Maya artifacts and sites (part of curriculum CD)
*Maya glyph worksheet packet (one for each student)
**Intrigue of the Past* Lessons
*Pottery making clay (enough for each student to have a baseball-sized piece)
*Rolling pins or wooden dowels (optional)

*Alternative to pottery making #1: construction paper, drawing tools, and glue (enough for each student)
*Alternative to pottery making #2: small unglazed orange/red flower pot (one for each student)
*Pottery decorating supplies: paint brush, black poster paint, water, and two disposable cups for water and paint (for each student)
*Enough rolls of brown butcher paper to provide one 12 inch by 36 inch strip of paper for each student (or cooperative group)
*Large piece (room height) of butcher paper for stela construction
*Paint brushes, white tempura paint, disposable cups for paint and water (one for each student)
*Old newspapers to protect table surfaces
*Colored magic markers or poster paints for use by each student

Anticipatory Set:

1. Ask students, "What do you know about the ancient Maya culture?"

   Note: Let students share what they know or have heard about ancient Maya culture. It is difficult to predict what they will answer. However, you may expect answers such as the Maya built pyramids, were astronomers, had a writing system, lived in Central America, etc.

2. As the students respond, write their comments on the board or overhead transparency.

3. Remind students that communication is a basic human need which every culture meets in some way.

4. Tell students that they will be learning about the ancient Maya by looking at their writing system.

5. Have students start a timeline comparing Maya dates found in this lesson (either individually or in cooperative groups).

   Note: An example has been included at the end of the lesson plan.

Procedure:

- For the next part of the lesson, students must read the material in the Student Text. (Make sure each student has a copy.) this can be done through silent reading, choral reading, or you can read it with them. The assigned readings are included for your reference. Each of the following sections will indicate the necessary student readings, followed by a focus question to facilitate discussion and information that you, the teacher, will use to clarify and elaborate on the reading material. You may want to get some Cooperative Groups working together as the students become familiar with the concepts and terminology. Most pictures have been excluded from the lesson plan text unless they were necessary or could not be removed due to computer stubbornness.

Student Text #1:

> The Maya are native people who live in the modern countries of Mexico, Guatemala, Belize, and Honduras. They have lived in this same location for at least the past 3,000 years. The Maya are divided into groups who live and lived in the mountainous areas of these countries (except Belize), along the Pacific coast, and in the lowland tropical forests along the Caribbean coast.

- Using a large map of North and Central America, locate the countries of Mexico, Guatemala, Belize and Honduras. The Maya did not live in all of Mexico, only the southern part that includes the modern Mexican states of Yucatan, Quintana Roo, and Campeche.

Student Text #2:

> Archaeologists have studied the ancient Maya for more than 150 years. To be able to compare Maya sites to each other, the archaeologists have used artifacts, Maya writing, and excavations to tell when the Maya lived in their different cities. When archaeologists talk about Maya cities, they often refer to them as sites. A site is a place where people lived in the past. Many sites are well known and are visited by thousands of tourists each year. The Maya site that we will study in this lesson is called Cerros. It is not as well known, but has been well excavated by archaeologists. It is located on the east coast of Belize near the Caribbean. Archaeologists have found that the Maya lived at the site from 100 B. C. until A.D.1,500, but our visit will be to see what the archeologists have discovered about the site in A. D. 900.

- Ask students, "Have you read about any Maya sites or seen TV programs about sites?"

- Tell students that some of the more famous sites include Tikal in Guatemala, Copan in Honduras, Palenque, Chichen Itza, and Tulum in Mexico.

- Show the location of these sites using the overhead transparency.

- Point out the location of Cerros on the large map, using the map in the student text as a reference.

Student Text #3:

> What is the Maya environment like? The Maya in Belize lived in a tropical environment. The temperature is hot all year, but in the summer and fall, there is much more rain than in the winter and spring. In fact, there are really only two seasons – the rainy season which lasts from May through December and the dry season from January through April. The rain and warm temperature is an ideal environment for plants and the Maya forests are thick with trees over 200 feet tall or as tall as a 20 story building. At ground level the tree trunks are wide in diameter and separated as if placed in a park. The trees have to have space between their trunks so the branches and leaves have room to grow. The tree tops grow closely together, so that little light reaches the ground. In the forest, it always seems overcast or like dusk because little sunlight reaches the ground. To imagine what it's like in the Maya forest turn off the light in the classroom and close the blinds. Below the tall treetops, the Maya forest has three other layers of vegetation each of which is home to plants and animals.
>
> As many as 40 species of plants are found in each acre of the forest. One common tree species is the Mahogany tree. You may have furniture made from this wood in your house. The soil is thin

in the Maya area and trees often have "buttresses" extending from the trunk to support them. They are also often covered by vines which use the trees to reach the sunlight.

The Maya forest is home to many species of animals as well. We know that many of these were important to the ancient Maya, because we see drawings of the animals on their pottery and in their books. Some forest animals include: jaguars, panthers, ocelots, spider monkeys, howler monkeys, coati mundis, peccaries, deer, rabbits, bats, and armadillos. Reptiles and amphibians are also common and include: poisonous and harmless snakes, iguanas, alligators, crocodiles, tree frogs, toads, and turtles. Insects are everywhere from biting flies, to mosquitoes, spiders and scorpions, and brightly colored butterflies. Colorful birds including macaws, parrots, and toucans fly overhead. The rivers and seas were full of fish and shell fish.

- Using the Maya CD, ask the students to list adjectives to describe the forest. Some of the pictures show trees covered with vines and stickers. Others are of swampy areas or of flowers. The upper forest canopy is full of orchids.

- Show students tropical forest transparencies and review the material in the reading.

- Have the students discuss what it would be like to try to live or travel through this environment.

- Using the photos of Maya ceramics from the Maya CD, have each student or group of students try to identify one of the animals shown.

- Have each student research and write a brief paper about an animal from the Maya forest: its habitat, the foods it ate, and how it might have been used by the Maya.

4. Student Text 4:

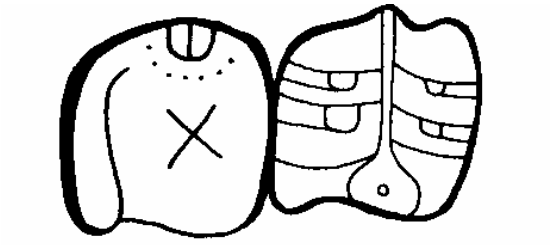
Archaeologists and historians have investigated Maya sites for over 150 years. In that time, we have learned about Maya cities from accounts left by the Spanish colonists who conquered some of the last Maya cities, from the Maya writings, from oral histories or traditions passed down to the Maya who live today from their ancestors, and from archaeological excavations. In these next two sections, we will compare what we know of the Maya from their writings (in this section) and from archaeological excavations (next section).

The Maya written language was thought to be undecipherable until the 1960s when researchers began to realize that the hieroglyphic symbols represented syllables rather than individual letters as in our writing. Maya writing was confusing because several written symbols might be used to represent the same syllable and because the Maya often used a type of calligraphy in their texts. Our first understanding of Maya hieroglyphics came from one of the Spanish priests, Bishop Landa of Merida, who wrote about the Maya in the 1570s. Bishop Landa is a controversial figure in Maya history. Much of the information we know about the Maya comes from a book he wrote about the Maya in 1573. At the same time, because he believed that the Maya were using their written books to practice their native religion, he burned all he could find. So we lost the chance to learn about the Maya from their own writings.

Bishop Landa recorded some of the symbols and their translation into Spanish sounds, but in some cases, he listed two or three symbols to represent the same sound. We now know that his list was incomplete and we have been able to identify more symbols by comparisons with the Maya text.

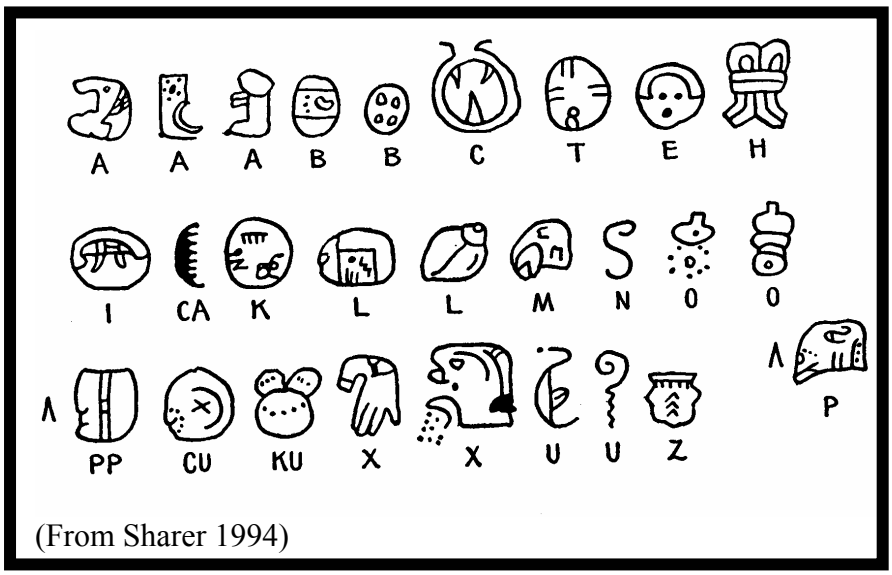
Here's an example of how one symbol was translated:

The Maya word for Turkey is *cutz (pronounced kootz)*. In several Maya books, a picture of a turkey is found with two symbols:



From Landa's symbols, we know that the first of these glyphs is *cu.*

Here are Landa's symbols:



(From Sharer 1994)

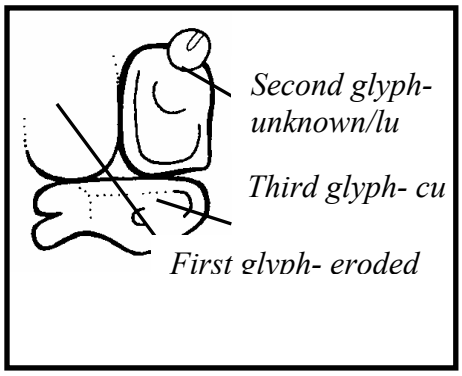
If you look at the second symbol from the left in the bottom row, you will see that it is the *cu* symbol. It looks different because it is turned to the left. You can recognize it by the x in the center, the arc of dots or a line next to the x, its round shape and the little mouth on one edge. These differences are differences in writing styles, as if we wrote the letter A in all these different ways –

A a A A **A A a A a A A A**

(The last three version of "A" are in gothic style.)

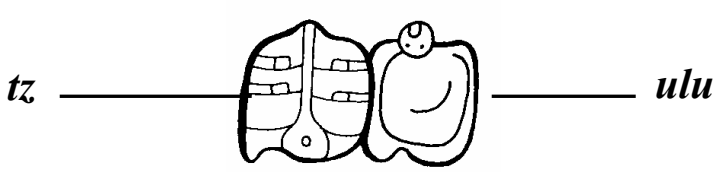
None of Landa's symbols match the second symbol in turkey. Since we know the Maya word for turkey is *cutz*, we can hypothesize that the second syllable is *tz*. How can we find out if these is the case?

When we discover the meanings of ancient writings we say we have **deciphered** the writing. Mayanists **decipher** these symbols by comparing combinations of known and unknown symbols and looking for similar patterns. So to decipher the symbols for turkey, the Mayanists found other sets of symbols that contained some of the same ones. For example, Mayanists found this combination in one of the surviving Maya books, the Dresden Codex:



The first glyph is eroded, the second is unknown and the third is another version of the *cu* glyph. Mayanists call a group of hieroglyphs written together a **glyph block**. This **glyph block** is for the number 11 or *bu-lu-cu*. Now we know the glyphs for cu and lu and we think the second glyph for turkey is *tz*. So if we could find a word that combines the *tz* and *lu* glyphs, we could be sure of our *tz* identification.

There is such a word in Maya. *Tzul(u)(zul)* means dog. We have examples of this



combination in several codices found with a picture of a domestic dog. By making thousands of these kinds of comparisons, Mayanists have discovered the meanings of thousands of these symbols.

- From the package of Maya handouts, distribute 2 worksheets for students to use to write their names using Maya hieroglyphs. The first is a version of the Maya syllabery which is like the Maya alphabet. However, since the written Maya symbols represent syllables rather than letters, each row represents combinations of consonants and vowels. For example, the first second row shows the symbols for "ba" "be" "bi" "bo" and "bu". As you will see, not all of our English sounds have equivalent sounds in Maya . For example my name is Beverly. There is no Maya equivalent of v or r. So, as you will see on the second worksheet handout, when I write my name, I use the closest equivalents.

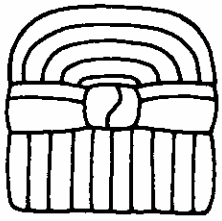
- Explain the syllabery to the students. Using the second worksheet, have students write their names using Maya symbols.

Note: Although, the symbols are not really equivalent to our English letters, these exercises give students a sense of that languages are different and that people use different types of sounds and different combinations of sounds and that writing systems are different as well.

• After the students have understood the concept that Maya writing symbols represent syllables instead of individual letters, give them the third worksheet. This worksheet contains names of animals from the Maya area written in glyph blocks. Have the students use the syllabery to translate the glyphs and then match these translations to the animal names listed on the sheet.

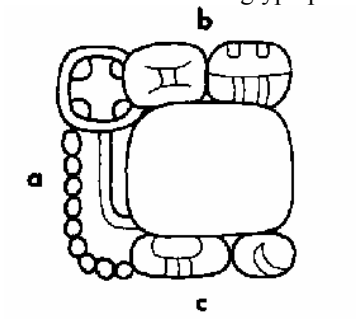
5. Student Text 5:

Once Mayanists understood this basic structure of Maya hieroglyphic writing, they began to look for recurring sets of glyphs that could be used to translate Maya writing on stone monuments called **stelae** and pottery. They found glyph blocks that were the names of cities and glyphs that there the titles of rulers. For example, the glyph for the site of Tikal is this block.



It means "Place of the sacred bundle." It is pronounced as *Mutul* and so we know that the ancient name of Tikal is *Mutul.* These types of glyphs are called **emblem glyphs.** Mayanists were able to identify the emblem glyphs because they noticed that they always found one glyph that never changed in front of a second glyph that was different in the writings of different cities. This first glyph is called a **prefix** glyph or a glyph that says "Here comes the name of a city."

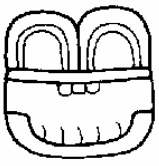
The emblem glyph prefix looks like this:



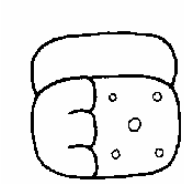
Some of the other Maya emblem glyphs are shown in the drawing box below:

Copan
(a bat)

Quirigua
(a cacao tree and chocolate pod)



Yaxichilan
(cleft or notched sky)



Piedras Negras
(the Quincunx or
symbol of 5 dots)

Palenque
(a bone)

Palenque (another version)
(a skull)

Seibal
(the sky)

Naranjo
(crossed sky bands)

Petexbatun
(a bundle)

(from Sharer 1994)

- Have the students match the emblem glyphs with the sites located on the map of the Maya area used in the first reading. Have them write the glyph next to that site name.

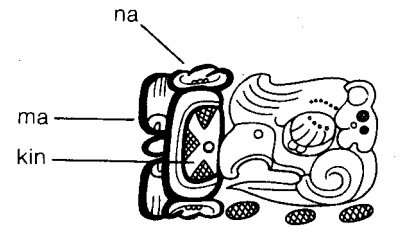
- Have the students choose one of the emblem glyphs to use in a later activity. Have them draw the glyph following the prefix glyph.

> **Note:** As you can see, many of the emblem glyphs also contain pictorial elements that may have described some feature or reference to the city, for example, Copan's emblem incorporates a picture of a bat. This might be similar to some of the nicknames we use for cities like calling New York the big apple, Chicago the windy city, or Cincinnati the queen city.

- Have the students either individually or in groups design emblem glyphs.

6. Student Text #6:

> The Maya used many types of prefix glyphs to alert the reader that something important is coming. They used prefixes to tell us that the name of a Maya king is coming. One of the ways that Mayanists have learned about Maya kings is by carvings or texts that list the names of Maya kings. This has given us the history of many Maya cities. The Maya prefix that identifies a ruler's name is:



(from Coe 1992)

The second glyph in this block is "Great Sun Quetzal" the name glyph of one of the last rulers of Palenque.

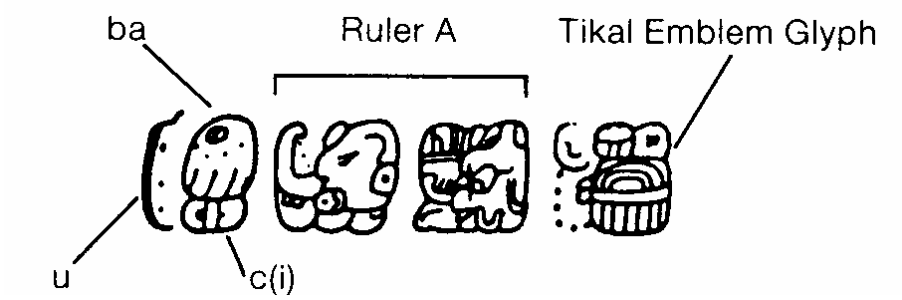
The Maya also used prefixes to tell us that the text is going to tell us about something that belonged to someone. Mayanists were surprised to discover that many glyph blocks were just name tags telling us things like "This is John's pot" or in Maya word order "his pot, (he is) John." The glyph that means his (or hers) can take several forms.

It may look like this 

or this 

. The glyph is pronounced *u.*
(from Coe 1992)

Here is an example from Tikal:



(from Coe 1992)

A Maya would read this as *u bac,* [Ruler A's name of] *Mutul*. In English we would read this as "This carved bone belongs to Ruler A of Tikal".

- The students can now begin to experiment with using these prefix glyphs. Have them use Worksheet 4 to create short Maya sentences.

Note: The Foundation for the Advancement for Mesoamerican Studies, Inc. (http://www.famsi.org) website is a great internet resource for information on Maya glyphs and writing. One section at http://www.famsi.org/mayawriting/dictionary/montgomery/index.html allows you to search for the Maya equivalent of English words and provides you with the appropriate glyph. If you have internet access in your classroom, you could have the students use the site to look up other words to use in this exercise. Just keep in mind that relatively few nouns have been translated or were used by the Maya in their written texts.

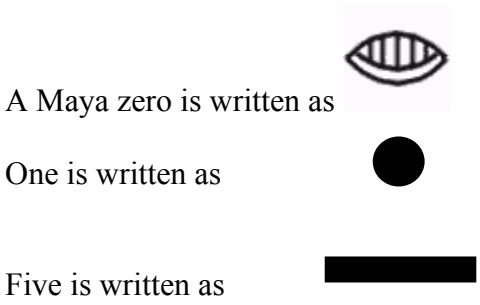
7. Student Text #7:

Numbers were an important part of Maya texts as they are in our texts. We use dates to tell us when something happened. Numbers tell us the distance between places, the age of people, the number of people or things involved in some activity, even street addresses. For example, a story about a football game will include scores, the number of people who attended the game, the time the game lasted, the yards covered by plays, the total offensive yards, the number of penalties, and even the ages of some of the players. The Maya used many types of numbers as well, but their

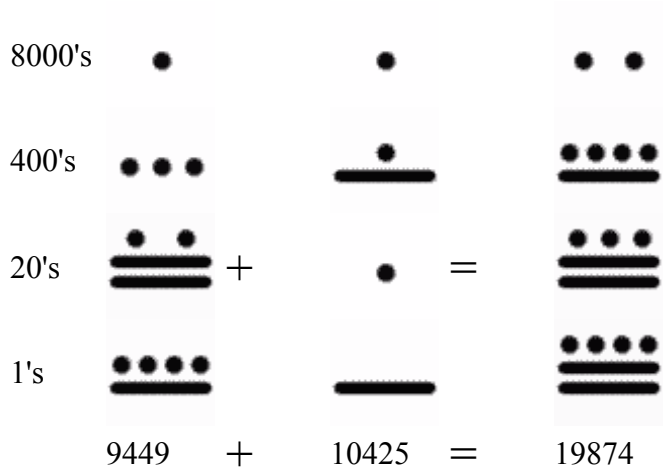
numbers were written in a different format and were based on a different number of system, Our number system is a **base 10** system. This means that we count in groups of ten and multiples of 10. Our numbers are made of combinations of 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. The Maya number system is a **base 20** system made of a combination of only three figures: 0, 1, and 5. One way to think of these base 10 and 20 systems is that a base 10 system is based on counting on your fingers. The base 20 system is based on counting on your fingers and toes.

Our number system is made of larger groups of numbers like tens, hundreds, thousands, millions, billions, and others. These can be written as numbers because we have a system that uses place holders to mark the number of tens in the number. So one million can be written as 1,000,000 or one million + zero hundred thousands + zero ten thousands + zero thousands + zero hundreds + zero tens + zero ones. In each case, each number is multiplied by 10 will result in the next number to the left. So a number like 153,982 means (2 x 1)+ (8 x 10) + (9 x 100) + (3 x 1,000) + (5 x 10,000) + (1 x 100,000).

The Maya number system is based on multiples of 20.



Numbers are written from top to bottom with the lowest a number between 1 and 19. The next group contains 20s and includes numbers from 20 to 380 (19 twenties). The third group contains 400s which are numbers between 400 and 7,600. The last group are the 8 thousands. The table below shows how three large Maya numbers are written and how they can be used in addition.



(Number drawings courtesy of the MichaelB website http://www.michielb.nl/maya/math.html)

- Review the addition in each column with the class.

  Note: Column 1: (1x 8000) + (3 x 400) + (12 x 20) + (1 x 9) = 9449
  Column 2: (1 x 8000) + (6 x 400) + (1 x 20) + (5 x 1) = 10425
  Column 3: (2 x 8000) + (9 x 400) + (13 x 20) + (14 x 1) = 19874

- On Worksheet 5, students can write, add, and subtract Maya numbers. Have the students complete the sheet either in groups or individually.

8. Student Text #8:

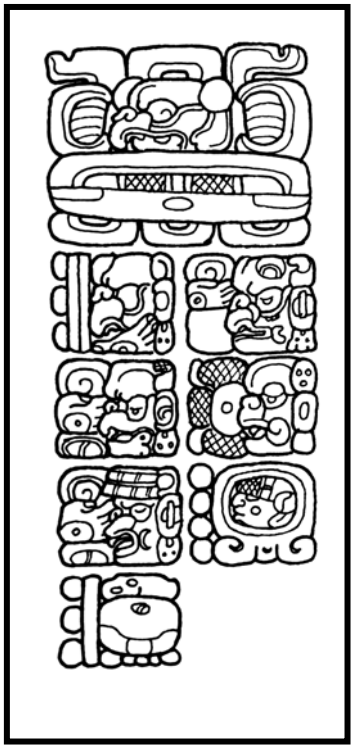
One important use of Maya numbers is for calendar dates. The Maya calendar system is like ours in that it is based on days, months, years, and larger groups that can be used to write any date in the past or future. It differs because these dates are divided into large groups based on multiples of 20, instead of 10s like our dates. In our calendar, a decade is 10 years, a century is 100 years, a millennium is 1,000 years.

The Maya term for a day is *kin.* All of the other terms used in the calendar are based on increasing numbers of days. So, used in the calendar are kins, uinals, tuns, katuns, and baktuns.

20 Kins = 1 Uinal	**A uinal is a 20 day month.**
18 Uinals = 1 Tun	**A tun is a 360 day year.**
20 Tuns = 1 Katun	**A katun is 7,200 days.**
20 Katuns = 1 Baktun	**A baktun is 144,000 days or 400 tuns**

A cycle of 13 Baktuns is called a ***Great Cycle***. The last Great Cycle began on August 13, 3114 B. C. A Great Cycle lasts for 1,872,000 days.

An example of a long count date might be 8 baktuns, 11 katuns, 15 tuns, 3 uinals, and 18 kins. A shorthand way to write this date is 8.11.15.3.18. It corresponds to 1,236,678 days since the start of the current Great Cycle or Wednesday July 9, 273 AD.



Maya dates can be written in glyph blocks in texts. The long count for January 1, 2004 is 12.19.10.16.3 or 1,868,723 days since the start of the Great Cycle. On carved stelae, the Maya wrote dates using numbers with glyphs for kin, uinal, tun, katun, and baktun.

This is an example of a Maya long count date:

This large glyph is a type of prefix glyph called an **Introductory Glyph.** When you see it you know a date will follow.

Maya glyphs are read in columns from left to right and top to bottom. The two glyphs in the row just below the Introductory glyph are the Baktun and Katun glyphs. This date is 13 Baktuns, 0 Katuns.

The next two dates are the Tun and Uinal glyphs. In this case there are 0 Tuns and 0 Uinals.

In this row are the glyphs for the Kin or day and one of the month signs. In this example, the date is 4 Ahau.

This is another month sign. In this case it is 8 Cumku. The date is carved on one of the Stela C from Quirigua. It is the date for the end of the current Great Cycle or December 21, 2012.

The next section will describe the two types of Maya months.

- Have the students convert dates that are important to them into long count dates.

> **Note**: There are a number of date converters that will turn any date into a long count date on the web. One good site is found at this address - http://www.mayabelize.ca/maya/index.shtml

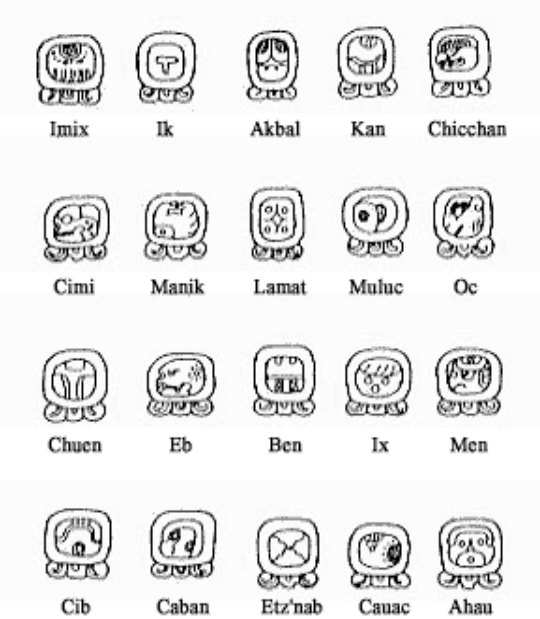
- Have the students turn their dates into the version of a date as carved on stelae by filling in the dates with the glyphs on Worksheet 6.

9. Student Text #9:

The Maya used two yearly calendars. One called the vague calendar or *haab* had 365 days made of 18 months of 20 days and one month of 5 days. In this calendar, the Maya combined a sequence of days numbered from 0 to19 with months numbered from 1 to 19, except for the last month, Uayeb, that had only 5 days. The days are named in the calendar as:

The months of the Haab are read 1 Pop, 2 Pop, 3 Pop…19 Pop, 1 Uo, 2 Uo, 3 Uo…to 19 Cumku, 0 Uayeb, 1 Uayeb, 2 Uayeb, 3 Uayeb, 4 Uayeb, 1 Pop…

The haab calendar started on 8 Cumku.



The sacred calendar or *tzolkin* had 13 months of 20 days for a total of 260 days. These are more similar to weeks of 13 days and are read 0 Ahau, 1 Imix, 2 Ik, 3 Akbal, 4 Kan, 5 Chicchan, 6 Cimi, 7 Manik, 8 Lamat, 9 Muluk, 10 Oc, 11 Chuen, 12 Eb, 13 Ben, 1 Ix, 2 Men, 3 Cib, 4 Caban, 5 Etz'nab, 6 Cauac, 7 Ahau…

The length of the Tzolkin year was 260 days and the length of the Haab year was 365 days. The smallest number that can be divided evenly by 260 and 365 is 18,980, or 365×52; so in the Calendar Round each day

and month combination occurs only once in 52 years. So for example, the day month combination "4 Ahau 8 Cumku," will not reoccur until 52 years later.

10.1. Student Text 10.1:

Stelae, Codices, and Pots and Archaeological Context: We've seen how the Maya used glyphs to record numbers and words. Now we can look at the way the Maya used their glyphs and the places the glyphs were painted or carved. For archaeologists to decipher the glyphs, it is important to know where glyphs are found to be able to interpret their meanings. In fact, before archaeologists discovered that the glyphs represent syllable from Maya languages, the deciphered some glyphs just from analyzing where certain glyphs occurred. For example, the emblem glyphs (Text 5) that stand for the names of Maya cities were discovered in this way as was the glyph for *Ma'kina* (Text 6).

In Text 6, we also learned that the Maya carved "name tags" on many of their possessions, like jade earrings or carved bones. So archaeologists could use these discoveries to compare sets of glyphs that were found in similar locations. The Maya used glyphs in many places in their sites, but we most commonly find glyphs carved on large stone pillars called ***Stelae***, carved on stones that form parts of buildings (like staircases or benches), painted as part of murals in tombs or rooms of palaces or temples, painted or carved on pieces of pottery, painted on the pages of Maya books called ***Codices***, or carved on jade, bone, or shell jewelry.

The location of a hieroglyphic text and the glyphs that are found together in a text provide the ***context*** for the text. ***Context*** is an important concept used by archaeologists not only for deciphering texts, but also for deciphering information from archaeological excavations. The items that archaeologists find in their excavations are called ***artifacts.*** The context of artifacts or glyphs helps archaeologists understand what happened in a place or what is being said in a text. For example, if an archaeologist came to your house, she might look at all the things (your ***artifacts***) in your bedroom. Even without knowing you, the archaeologist could know a lot about your from your possessions. She might be able to tell how big you are from your clothes, what your favorite colors are and whether you are a boy or girl. Even more, the archaeologist could tell what you like to do. If you like to read, you probably have books in your room. If you like sports, you may have balls, bats, uniforms, team pictures, and trophies in your room. So even without knowing you, the archaeologists could know about you. By studying the ***context*** of other rooms in your house, the archaeologist could learn about your family as well- what you like to eat, what hobbies your family has, even how many people are in your family. Archaeological context is fragile and easily destroyed. That is why archaeologists have to be so careful to record everything they excavate in journals and on maps. Imagine if the context of your house was destroyed by taking everything out of your house and out of all of your neighbors' houses. Then imagine that half of all this stuff was thrown into a dump, that most of the rest was tossed into a river, and that the really valuable things like you mother's jewelry was sold to people in another town. Archaeologists would have lost the opportunity to learn about you and your neighbors.

Each of the places in which Maya glyphs are found provides the ***context*** for that text. Archaeologists have found that there are patterns to the types of glyphs found in the different contexts. By studying the patterns even before the glyphs could be understood, archaeologists were first able to understand some of their meanings.

- To emphasize the concept of context, use Lesson 4 from *Intrigue of the Past*.

10.2. Student Text #10.2:

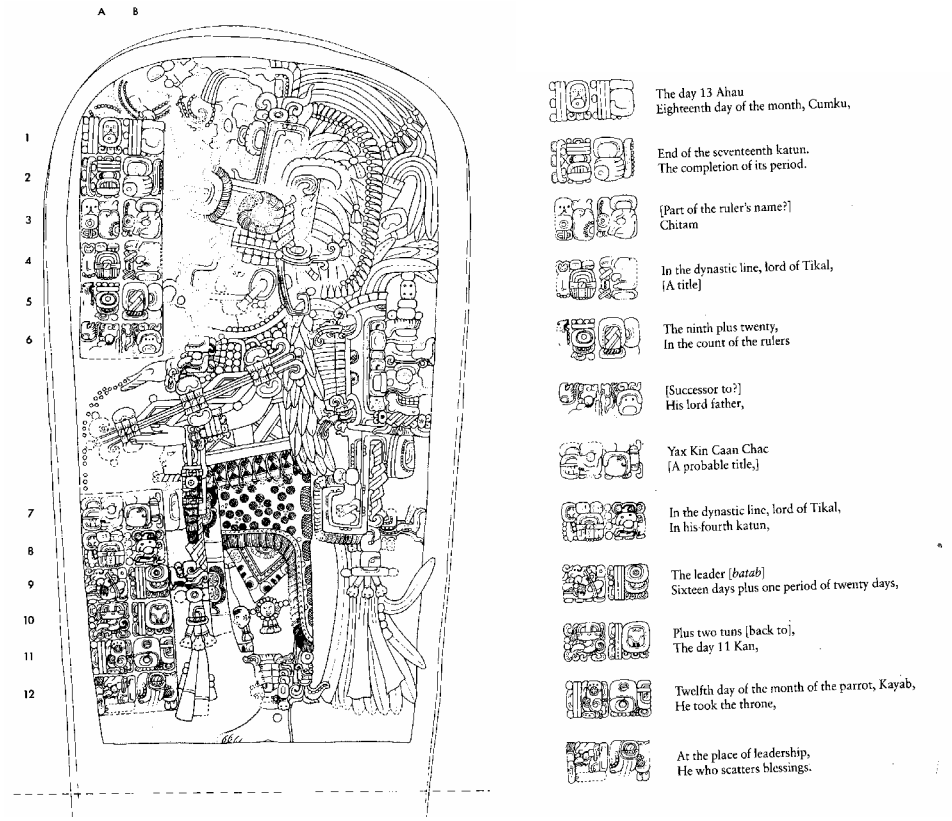
One of the most visible locations for glyphs at Maya sites are large carved stones that are often seen standing in front of Maya temples. These are called stela (singular) or stelae (plural). Some

stelae are carved on all sides, others are carved in the round so they look almost like statues. Most have a carving of a Maya ruler on one side, sometimes other carved figures on the stela may include the ruler's heir or parents. They often describe the ruler taking part in a ceremony that recognizes his accession to the throne or celebrating an important anniversary of his rule or victory in battle. A few stelae were dedicated to women usually either wives or mothers of a ruler. Most stelae are very large. Some from the site of Copan are more than 20 feet high. Some still stand in Maya cities; others have fallen to the ground or have been knocked over and broken into pieces by conquerors of their cities. The Maya called stela "*Tze-tun*" or tree stones.

The photograph to the left shows one of the stela from the site of Copan in 1885. Pictured in the photo is Alfred Maudsley, one of the first archaeologists to explore the site.

The glyphs on Maya stela usually include a long count date, the name of at least one Maya ruler, and a description of an important event. The stela shown below is Stela 22 from Tikal. The stela has been translated by Christopher Jones of the University Museum at the University of Pennsylvania.

Archaeologists have a standard way of identifying glyphs written in a text or on a stela. Since Maya texts are usually made up of a set of two glyphs and read from top to bottom, the columns of glyphs are identified by letters, starting from left to right. The rows are given numbers for identification. As you can see below, there are only 24 glyphs on Stela 22. Reading from the top of the stela, these are identread in order as Glyph A1, B1, A2, B2 A3, A4 and so on to the end of the text B12. The translation of the text is shown next to the drawing of the stela. Sometimes stela are paired with large flat circular stones which are also carved and are called altars or "Banner stones."



(from Sharer 1994)

Other Maya stone carvings were used to decorate buildings.. At several Maya cities, hieroglyphic staircases were constructed. These listed the history of city and named all the rulers. At Tikal, several of the tallest pyramids had high ***roof combs*** at the top of the building which also told important parts of the cities history. At the city of Palenque, carved panels in rooms at the top of small pyramids showed rulers engaged in activities like those on the stelae at Tikal. At Palenque, there is a famous carving that listed all the rulers of the site placed as the lid for a stone sarcophagus in which the most famous ruler of the site was buried. His name was Pacal and the discovery of his tomb and translation of the glyphs on his sarcophagus was one of the great discoveries of Maya archaeology.

- Tell students that Maya stela describe important events in rulers lives in very formal stilted couplets. The text from Stela 22 is a fairly simple text about the accession of one ruler.

- Show a transparency of Stela 22 to the class or have students examine the glyphs and what they mean in their student text.

- Have the students individually or in groups discuss or write about the answers to these questions about the stela.
    a. When did the event take place? (13 Ahau, 18 Cumku, end of the 17th Katun -No long count date is given)
    b. Who is the ruler written about in the text? (Chitam, Lord of Tikal)
    c. Where is the glyph for Tikal? What does it mean?
    d. What is his place in the dynasty of rulers at Tikal (29th)
    e. How old is he? (in his fourth katun – in his 80s)
    f. When did the action shown on the stela take place? (2years, 36 days before the stela was carved on the day 11 Kan, 12 Kayab)
    g. What happened? (Chitam became ruler of Tikal- He ascended the throne or was "inaugurated" and became the one who scatters blessings)
    h. Does the picture on the stela match the text? Does the ruler appear to be dressed for a solemn ceremony? How do our leaders dress during a similar ceremony?

- Ask students, "How would this event look to an archaeologist?" or "How might an archaeologist recognize Chitam, Lord of Mutul?"

Note: Let students brainstorm how the archaeological record of Chitam might appear.

- Tell students that archaeologists use the artifacts they find in context to interpret past events. Often Maya rulers are found in elaborate tombs or burial chambers with many of the artifacts they used in ceremonies.

- Ask students, "What artifacts do you see in the carving of Lord Chitam that an archaeologist would use to recognize him in a tomb?" "How would we know the artifacts were his?"

Note: The Maya labeled jade necklaces and earspools with the owner's name.

10.3. Student Text #10.3:

The Maya also used paint to create texts on uncarved stelae, in murals on the walls of temples, on pottery, and in books called codices (codex is the singular form). Because the wall murals and painted stelae contain texts similar to those carved in stone, this section will describe the kinds of information found on pottery and in codices.

The Maya made pottery in shapes like bowls, plates, jugs, basins, statues, and vases. Some vessels were used for cooking, others for serving food or carrying water. Pottery is made by digging clay from the ground, cleaning it, shaping the clay, heating or "firing" the clay to make it hard and strong. So the potter can be endlessly creative and can make items that are beautiful as well as useful.

Archaeologists love to find and study pottery. Fired clay pottery lasts a very long time. We find pottery in the tombs or burial places of Maya rulers and in the trash dumps around all Maya houses.

Some of the pottery is more than 3,000 years old so it helps us tell when the Maya lived in these buildings. Because pottery is so easy to make, the Maya made many different styles. Archaeologists use these styles to tell us when the pottery was made. Most of the pottery shown in these pages was made between A. D. 600 and 800.

Archaeologists also find that Maya pottery tells us about the environment. Pots were decorated with drawings of animals like deer, rabbits, monkeys, iguanas, toads, bats, parrots, vultures, or cormorants (a type of water bird). The pictures below show some Maya pots decorated with animal pictures **(A-E)**. The Maya dressed in animal costumes in some of their ceremonies. On some Maya pots, we see Maya musicians wearing the animal costumes **(C)**. Sometimes pots were made in the shape of animals, like **E** below which looks like an armadillo.

Many of these pots are shaped like cylinders with a flat base. The Maya decorated many of these cylinder vases with hieroglyphic texts, so we also call these **Codex-style vases**. These pots are like large cups without handles that are decorated with hieroglyphs and scenes of Maya kings or myths. The hieroglyphs tell us that these pots were used as drinking vessels for a chocolate drink. Cacao or chocolate beans were grown by the Maya and were made into a frothy drink sweetened with honey.

This is an example of the glyphs that tell us the pot was used for the chocolate drink.

(from Reentz-Budet 1994)

Maya pottery is found by archaeologists in **tombs** or burial places of Maya rulers and as broken pieces in the trash deposits around Maya houses. Most of the pots shown above were found in tombs or special deposits called **caches**. Caches are like time capsules placed as a dedication during the construction of a building.

Many of the scenes shown on Maya pots were taken from scenes that might be taken from the great Maya myth called the **Popul Vue**. The Popul Vue is a story of the history of the Quiche Maya who were the Maya who lived in the highlands of Guatemala. One part of the story is the story of two sets of twin brothers who were ballplayers and challenged the Maya gods of the underworld to a ballgame. (Scenes F and G show the Maya ballgame). The first brothers lost the game but one of them was the father of twin sons who also went to the underworld to play the game. These twins had many adventures and eventually triumphed over the underworld lords and won the game. In one of their adventures, the brothers hunt birds with a blowgun like the one in Scene H below.

- Have students do Lesson 14, "Measuring Pots" in *Intrigue of the Past.*

- Have students do Lesson 11, "Artifact Classification" in *Intrigue of the Past*.

- Ask students, "Are all of the dishes in your house the same shape? If not, how and why are they different?"

Note: Students should be able to identify differences in size of plates and bowls, differences in shapes which indicate functional differences such as plates, soup bowls, dessert plates, coffee mugs, tea cups and saucers, etc.

- Ask students, "Do you use some dishes in your house for special events or activities?"

Note: Students might identify holiday dishes, turkey platters, party dishes, etc.

- Have students research Maya pottery in the library and/or the Internet.

- Ask students, "How do the shapes and decorations differ from the pottery (ceramics) we use today?"

10.4. Student Text 10.4:

Maya archaeologists have identified several styles of cylinder vases. The styles were produced by master artists and scribes in different Maya cities. One style is known as the "Altun Ha" style because it was produced in or near the site of Altun Ha in Belize. Picture A in Text 10, part 3 is an example of an Altun Ha vase. A Maya archaeologist named Dorie Reentz-Budet identified these styles. She defined different styles based on the colors the Maya artist used and the subject of the scene on the Maya pot. The Altun Ha style pots have black backgrounds. The main scenes were painted in browns, reds, oranges, and yellows. Many of the images were of water birds like cormorants or quetzal birds. These pots had a band of hieroglyphs near the top or **rim** of the pot.

Dorie also analyzed the minerals that were found in the clay used to make the pots. Deposits of clay in different areas contain different **trace elements**. So a tiny piece of the pot can be analyzed and traced back to the location where the pot was made, even though it was discovered far from that location. Maya pots were traded between the rulers of the sites. The Quetzal pot was found far from Altun Ha in a tomb at Copan in Honduras. Other Altun Ha pots were found in northern Belize and southern Mexico. This pottery dates from A. D. 650-759.

These codex vases were often traded from one site to another or were given to visiting rulers during special ceremonies like katun celebrations or accession ceremonies (remember Text 10 part 1). The picture below may show a Maya noble on his way across country to such a ceremony.

He is accompanied by two trumpet players and his dog. Often the group traveling with a noble to a ceremony included traders. During the ceremonies, the traders exchanged jade, obsidian (volcanic glass), feathers, cotton cloth, and animal hides area in addition to codex vases. Many of the codex vases record these journeys.

Step 1: Have students manufacture pottery**.** **Alternative**: students will bring one small unglazed red/orange ceramic flower pot each or you will supply them for each student. These are inexpensive and available in discount and garden stores.

Note: If the school doesn't have facilities for firing clay, there are several types of self hardening clays available. Some of these actually have the consistency and texture of regular clay and are generally available from clay supply stores.

Note: Have students review what a cylinder base looks like by looking at the pictures in their student text.

Option 1: Have students make a small Maya cylinder vase from clay, using a pinch pot technique discussed in Chapter 9.

- Distribute a baseball-sized ball of clay to each student.
- Tell students to stick their thumb into the center of the clay ball.
- Tell students to start pinching the clay with the thumb and fingers until the desired shape of the pot has been achieved.

Note: Students will pinch using a variety of personal techniques which are comfortable to them.

- Fire the pots once they have dried.

Note: Fire the pots for the students. Enlist the assistance of the art teacher in this exercise.

Note: If you are not firing pots, but using self-hardening clay, be sure to follow the manufacturers instructions.

Option 2: Have students make a small Maya cylinder vase from clay, using the slab technique.

- Distribute a baseball-sized ball of clay to each student.
- Tell students to pinch off about ¼ of the piece of clay to use as the base.
- Tell students to flatten the ball of clay into a rectangle about ½ inch thick.

Note: Students can use a rolling pin or the palms of their hands to make the clay have a uniform thickness.

- Tell students to score or roughen the surfaces of the edges that they will bring together to close the cylinder.

- Once the rectangle is uniform in thickness and the edges are scored, tell the students to bring the edges of the clay slab together so that they form a cylinder.

> **Note**: Have students carefully pinch together the edges so that they form a smooth seam.

- Tell students to take the remaining clay, roll it out to the same thickness as the previous clay slab, and cut a clay circle large enough to fit the base of the cylinder.

- Tell students to score or roughen the edges of the circle and slab and fit the pieces together.

- Fire the pots once they have dried.

> **Note**: Fire the pots for the students. Enlist the assistance of the art teacher in this exercise.

> **Note**: If you are not firing pots, but using self-hardening clay, be sure to follow the manufacturers instructions.

Option 3: If circumstances preclude any use of clay or flowerpots, the students can create codex vases from construction paper or even copier or notebook paper.

> **Note**: In this approach, the design should be created before the paper is folded into a cylinder.

Step 2: Decorate the cylinder vases.

- Tell students to decorate their cylinder vases or flower pots in the codex vase style.

- Distribute paint brushes, black poster paint, water, and disposable cups for water and paint to each student.

- Tell students to use some of the glyphs from previous sections and create a scene to decorate the pot.

> **Note**: Sometimes several Maya artists pictured the same scene or event on codex vases. You might want to have students decide, as a group, on an important event and then individually or in groups decide how to portray the same event.

10.5. Student Text #10.5:

> **Maya Codex Books** The Maya used hieroglyphs in books called **Codices** (singular is codex). When the Spanish arrived in the Maya area, they found the Maya using books made of bark paper. Because they seemed to reinforce traditional Mayan religion and the Spanish were interested in converting the Maya to their Catholic religion, the books were viewed as evidence of "paganism". You should remember Bishop Landa of Merida from Section 10.3 who provided us with the information on the Maya syllabery that we now use to translate the hieroglyphs. Landa was shown several books by a converted Maya priest, Nachi Cocom, one of the descendants of a noble Maya family that recorded his family's history, rituals, and prophecies. Later, to prevent what he thought was a resurgence of Maya religion, Landa burned all of the books he could find. Estimates are that 26 books were burned. However, at least three and maybe a fourth codex have survived. They are named after the

cities where they are found today: the Madrid Codex, the Dresden Codex, the Paris Codex, and the Grolier Codex (named after a club in New York City).

The Madrid Codex is made of a long strip of bark paper that was folded like a screen. The pages are 9 inches by 5 inches. Bark paper is made by soaking strips of bark in lime until it becomes mushy. The Maya then used a stone tool called a barkbeater to spread the mushy fibers to a rough surface and scrape them until they form a thin layer that dries into a thin sheet of paper. The pages were then covered with a thin layer of lime. Brightly painted columns of glyphs, pictures of gods or animals were painted on this white background. All four of the surviving books contain almanacs and horoscopes rather than Maya history.

The four books that we have today were all written just before or after the Spanish arrived in the Maya area. No books have survived from the Classic Maya period, but we have found several in tombs. The books are not readable, because through time, the humidity has caused the paper to decay and the lime to coalesce into a mushy blob. One of the great finds in Maya archaeology would be a preserved Classic period book, perhaps from one of the dry caves in the area. While no Classic Maya books have survived, we have books painted on deerskin pages from the Mixtec-Mexica or Aztec part of Mexico.

- Tell students that they will create a version of a Maya codex in class.

- Distribute 12 inch by 36 inch long strips of butcher paper to each student (or cooperative group, if this is more practical).

  Note: Most rolls of brown butcher paper are 24 or 36 inches in width. Cut a piece that is 36 inches long. Then cut this into two or three sections each 12 inches high. Now you should have two or three long strips measuring 36 inches by 12 inches long.

- Distribute table protectors such as old newspapers and have students cover the work tables.

- Distribute painting supplies to each student or group.

  Note: Students will need white tempura paint, a paint brush, and disposable cups for the paint and water.

- Tell students to paint both sides of the paper with white tempura paint.

  Note: Have students wait a little for one side to dry a little before they attempt to paint the other side.

- Once the paper is dry, tell students to fold the strip like an accordion into 6 inch pages.

  Note: This results in 6 pages on each side of the strip.

- Tell students to unfold the strip.

  Note: The fold marks provide boundaries for each page.

- Tell students to write a story using the book they have created.

Note: Other versions of the bark book might be to just tape together sheets of white paper o which the students have written a story.

Note: Students can write any kind of story they want in the book. You could have them write an account of their individual family history with one page for each student. Along with the account, the students could draw pictures of their family or an important family memory.

11. Student Text #11:

Maya Scribes What do we know of the artists and scribes that created the stelae, codex vases, Maya folding books, and other hieroglyphic texts? Archaeologists have identified Maya scribes using the same techniques we use to make all archaeological inferences. We look for patterns in the associations of artifact types with the context in which they are found. We use the pictures that the Maya scribes have drawn of themselves on their codex pots to tell us about the artifacts used by scribes and even some of their names. For example, a vase and a plate from Guatemala show Maya scribes painting in a codex and carving shell masks.

This scene from a codex vase shows two scribes or artists. The one on the left holds a paintbrush and bowl of paint, while the one on the right seems to be carving or painting a mask. This artist wears a distinctive headdress that looks like a turban. Often an unopened water lily extends from the turban as is seen in scene below. Scene B is a close-up of the artist in Scene A. You can see his turban with the unopened water lily protruding from the front.

The artist also included the glyphs for his name. The placement of his name suggests that he is a member of the noble family. Another scribe is shown below painting a codex.

Maya artists used either conch shells cut in half or ceramic dishes to hold their paints. Conch shells were ideal containers because they would not absorb the paint. Maya paint brushes were made of either animal or human hair attached to the end of hollow tubes, like in calligraphy brushes. Other brushes may have been like the brushes used by the Hopi today in the southwest made of Yucca fibers attached to a stem. Maya paints were made of a mixture of the smallest clay particles with small amounts of pigments to make the colored paints. Reds and oranges were made from iron oxides or hematite. Adding magnesium or cobalt adds even more colors to the base paint color.

We know more about the Maya scribes from two tombs. One of these at Tikal was the tomb of Hasaw-Ka'an-K'awil, the great ruler who constructed Temple 1. Included in his burial goods was the paint dish . Spanish accounts written during the colonial period say that "they did not teach [their letters] to any except noble persons, and for this reason all the priests, who were those most concerned with them, were persons of rank." (from the *Relaciones de Yucatan* by Bishop Landa). Another tomb at the site of Copan contained a set of paint pots with other pottery vessels, and a decomposed codex. As with the tomb at Tikal this person buried in this tomb seems to have been a close relative of the ruler at the site. From other site and inscriptions on pottery, it seems that many scribes were the younger sons of site rulers.

- Ask students, "What kinds of skills do you think a Maya scribe needed to have?"
- Ask students, "What kinds of tools do you think a Maya scribe need to do his work?"

Closure:

1. Tell students that they will use their knowledge of Maya glyphs to create a class stela.

Note: Brown butcher type paper which comes on a long roll works well.

2. Have the students chose an important date, like the first day of school, to commemorate in their stela. For example, the first day might be the day that the teacher ascended to the throne of the classroom and scattered assignments. They can then create an emblem glyph for the school, include their names, draw a picture of the event, and record the number of days that have happened since that event.

Note: They can get a long count date from the website described in Text 8.

3. Tell students that artifacts found in Maya tombs tell us much about the Maya nobles, because they contain an association of artifacts in context. Yet because the artifacts are so valuable to collectors, many tombs are looted or robbed; stelae are cut up into pieces by chainsaws, and the remains scattered to Europe, North America, and Asia before archaeologists or scholars have a chance to study them. If the tombs at Tikal and Copan had been looted we might not have been able to identify Maya scribes or their equipment. Robbing tombs also steals the **cultural heritage** of the people who are descendents of the ancient Maya. The Maya did not disappear when the Spanish arrived. Millions of Maya people still live in the same areas where their ancestors lived. Yet, information about their past, their history, is being looted from archaeological sites every day.

4. Ask students, "Do you think it matters, that some people are selling and/or stealing Maya cultural remains? Why or why not?"

Note: Have students discuss this question, with guidance from you the teacher.

Assignment:

1. Divide students into cooperative groups.

2. Have each group research one of the sites on the map using the library or Internet.

3. Have each group present an oral report on their site.

Note: Each group should consider creating a visual component to their oral presentation.

Once all reports are completed ask students, "What do these sites have in common? How are they different?"

Note: Let students brainstorm the answers from what they learned from the readings and presentations.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials can be assembled in a student/group portfolio.

Adaptations:

1. Choral or group reading is an alternative to single reading if students have reading problems. This is a great way to practice reading and pronunciation of words.

2. To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

3. Some students may benefit from more individual attention from you or from partnering with another student, especially when working on art projects which may be beyond their physical means or attention.

4. Closely supervise student activity. Students are working with a very unfamiliar writing system and will possibly need your intervention and guidance throughout the exercise.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

www.mayabelize.ca/maya/index.shtml – Maya World Belize (date converter)

www.michielb.nl/maya/math.html Michiel Berger (Maya numbers)

Coe, Michael D. *Breaking the Maya Code*. Thames and Hudson, 1992.

Reentz-Budet, Dorie. *Painting the Maya Universe* Duke University Press, 1994.

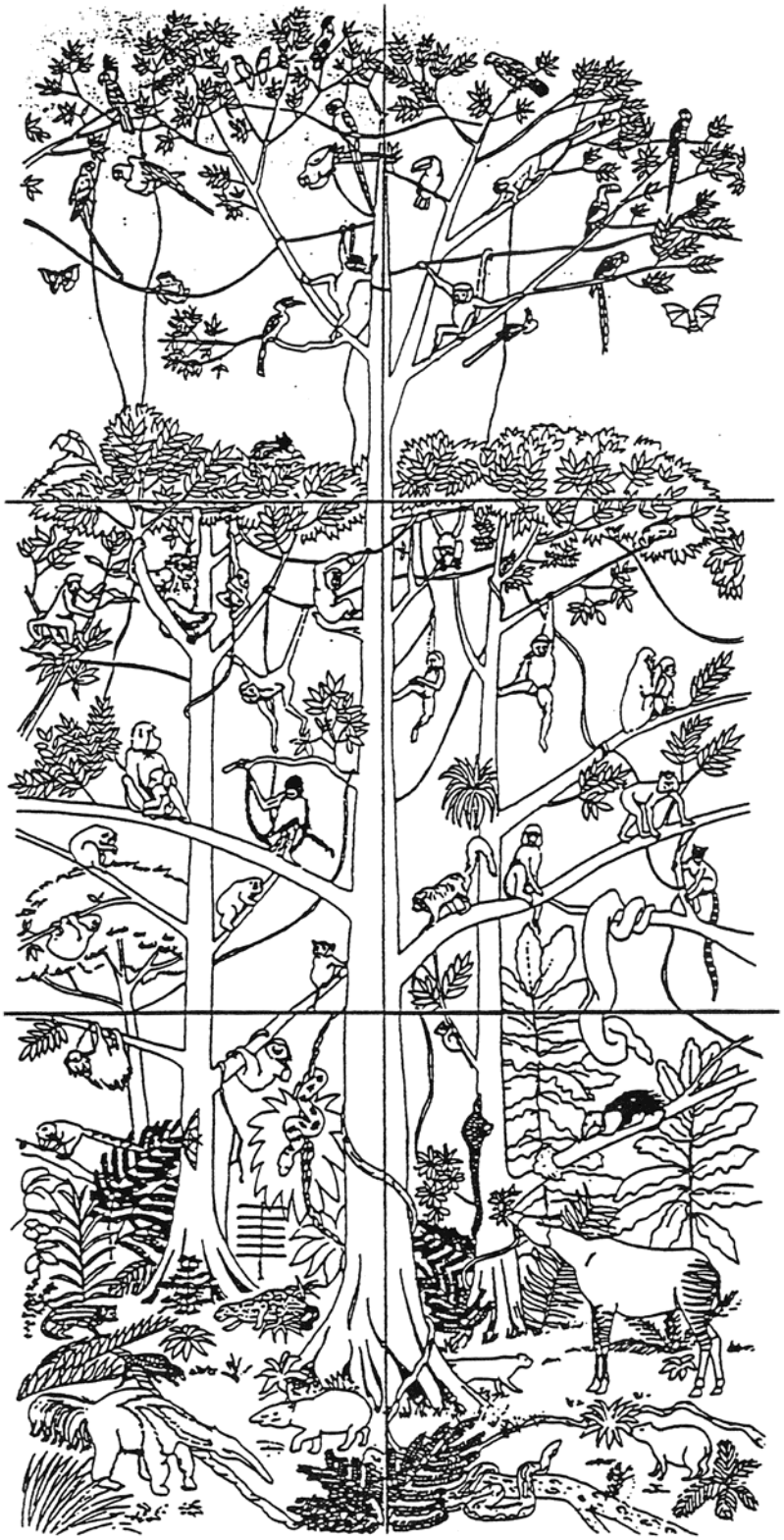
Sharer, Robert J. *The Ancient Maya*, 5th edition. Stanford University Press, 1994.

Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades*. United States Department of the Interior, Bureau of Land Management, 1993.

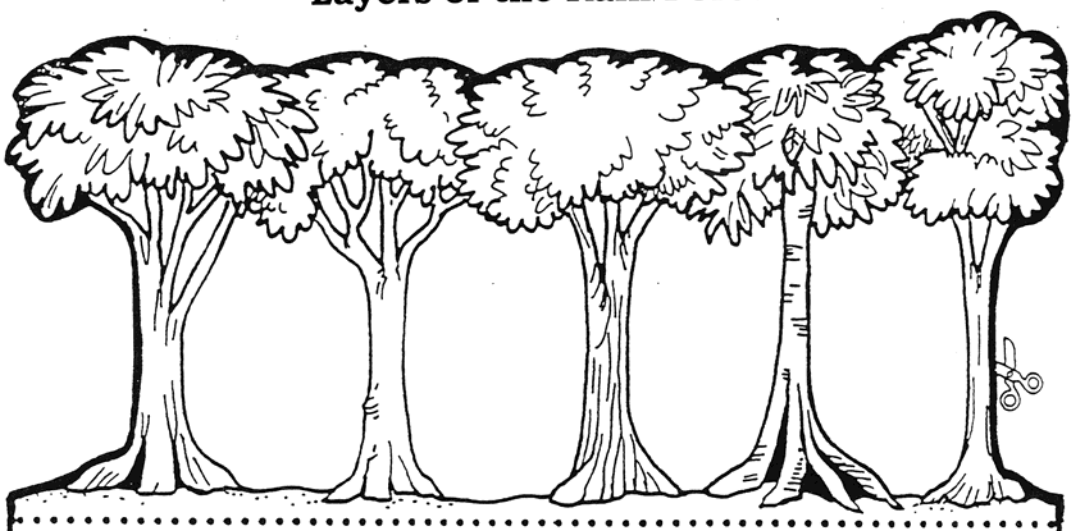
Time Line Chart

Date	Maya Event	Historical Event	My important event (example Beverly)
100BC	Maya first settled Cerros		
A.D. 0		Start of the Modern Calendar	
A.D. 900	Time of our visit to Cerros		
A.D. 1492		Columbus discovered the Americas	
A.D. 1500	Maya abandoned Cerros		
A.D. 1776		Declaration of Independence	
A.D. 1850	Archaeologists began to investigate the Maya area		
A.D. 1906			My grandmother's birthday
A.D. 1950			My birthday
A.D. 1977			My first archaeological excavation at Cerros

Transparency – Tropical Forest



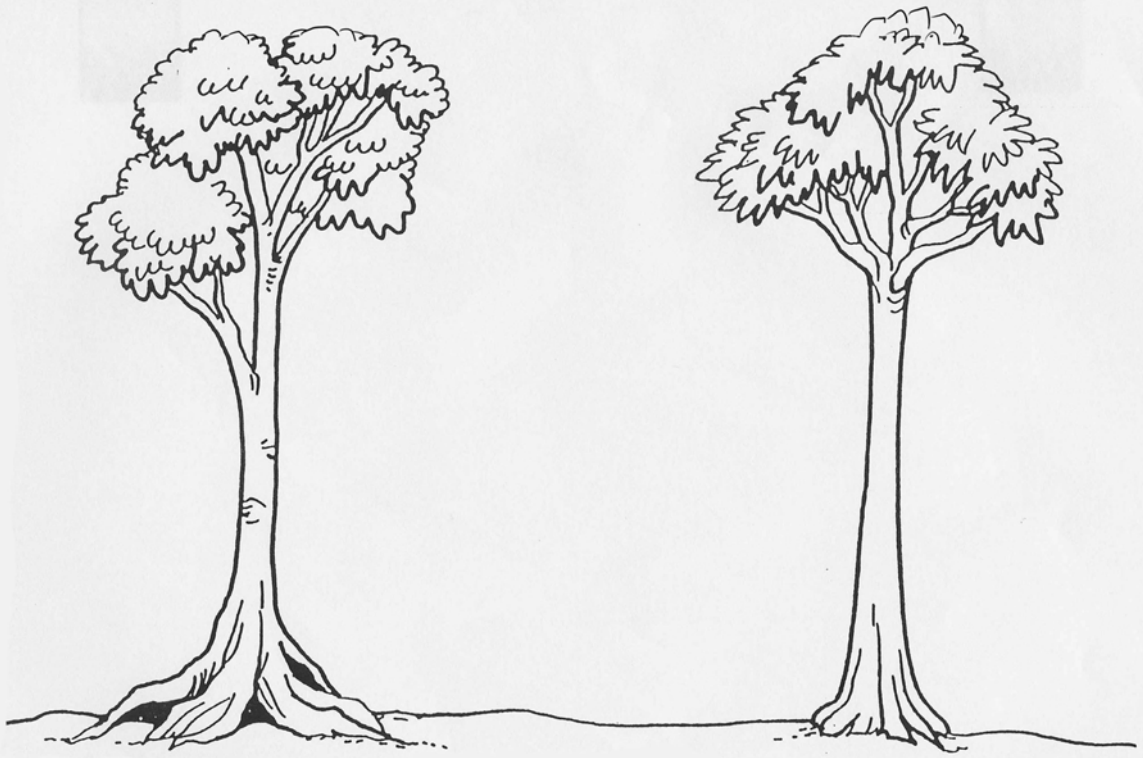
Layers of the Rain Forest



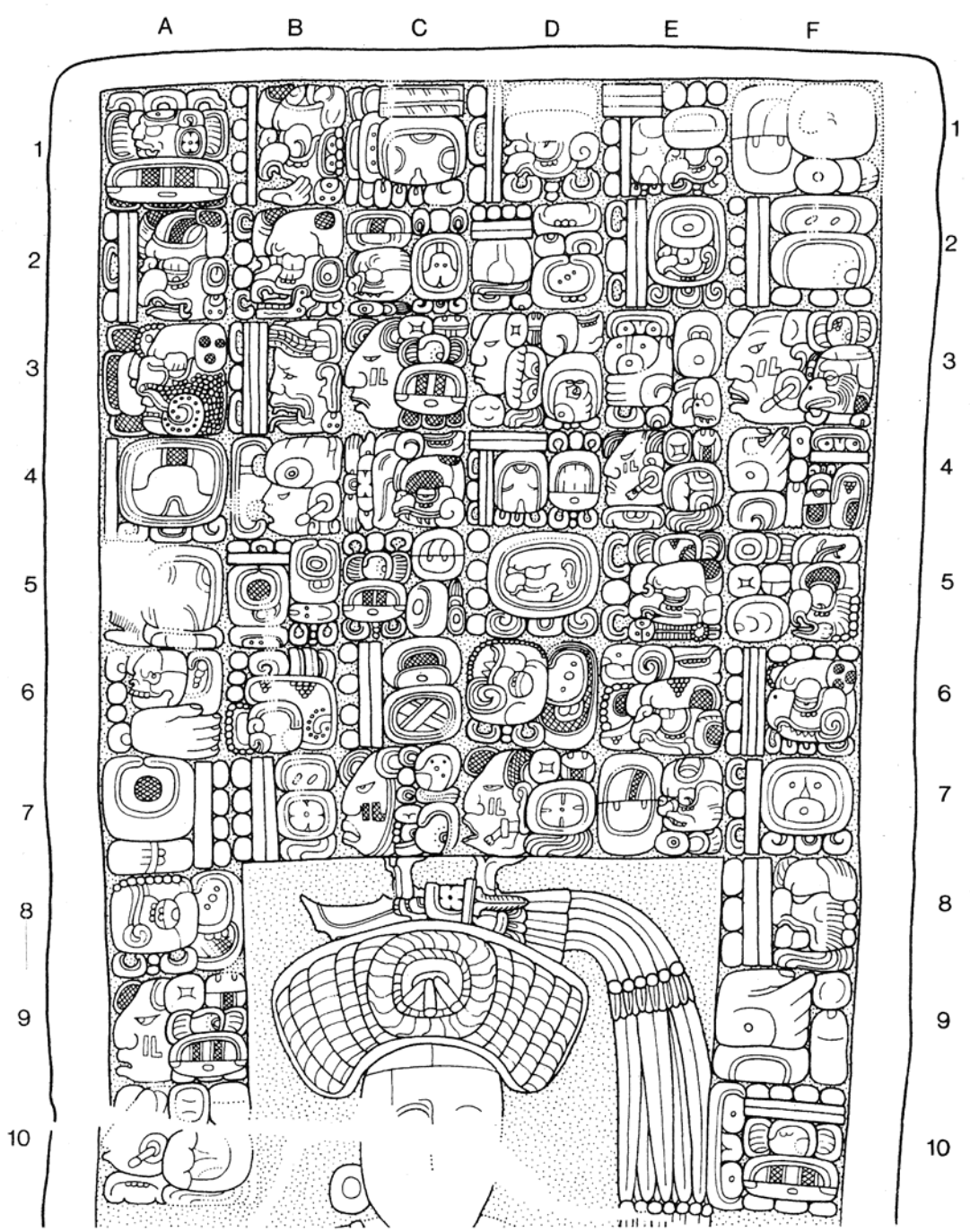
The canopy is the main top layer of the rain forest. It is made up of trees whose tops are very close together.

The understory is made up of shrubs, ferns, and small trees.

The forest floor is made up of fungi (plants that do not have flowers or leaves), mosses, and decaying leaves.



The emergent layer is made up of tall trees that rise above the rain forest's canopy.



68 *Stela 3, Piedras Negras: an example of a complete text, its reading, and its translation.*

Write your Name in Maya Glyphs

1. Our writing system uses letters representing individual sounds that are combined into words. The Maya writing system is different in that words are divided into syllables. Symbols are used to represent these syllables. In English, we occasionally use a single symbol or "letter" to represent a syllable, like when we use "a" as a word as in "a horse". To write your name using Maya glyphs, you must first break your name into syllables. For example:

Kate = "ka" + "te"

Some names are more difficult, because you must add an imaginary or silent letter:

Jon = "jo" + "ne"

Some names include sounds that are not found in Maya languages, like "r". You can use the syllabary to find a substitute or you may leave that letter out of your translation, as shown in my name:

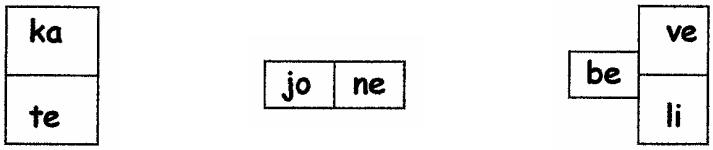
Beverly = "be" + "ve" + "Ii"

2. Break your name into syllables:

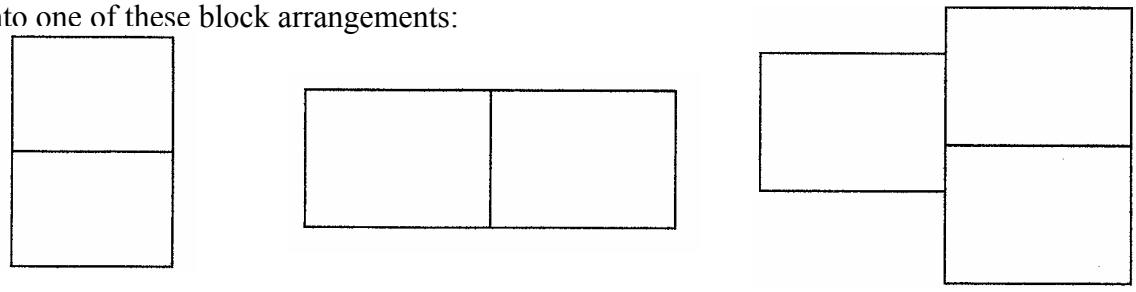
_____ = _____ + _____ + _____ + _____

3. Now use the Maya Syllabary on the back of this page to match the syllables from your name:

4. The syllables are then combined into blocks to form word glyphs. Examples of word arrangements are:



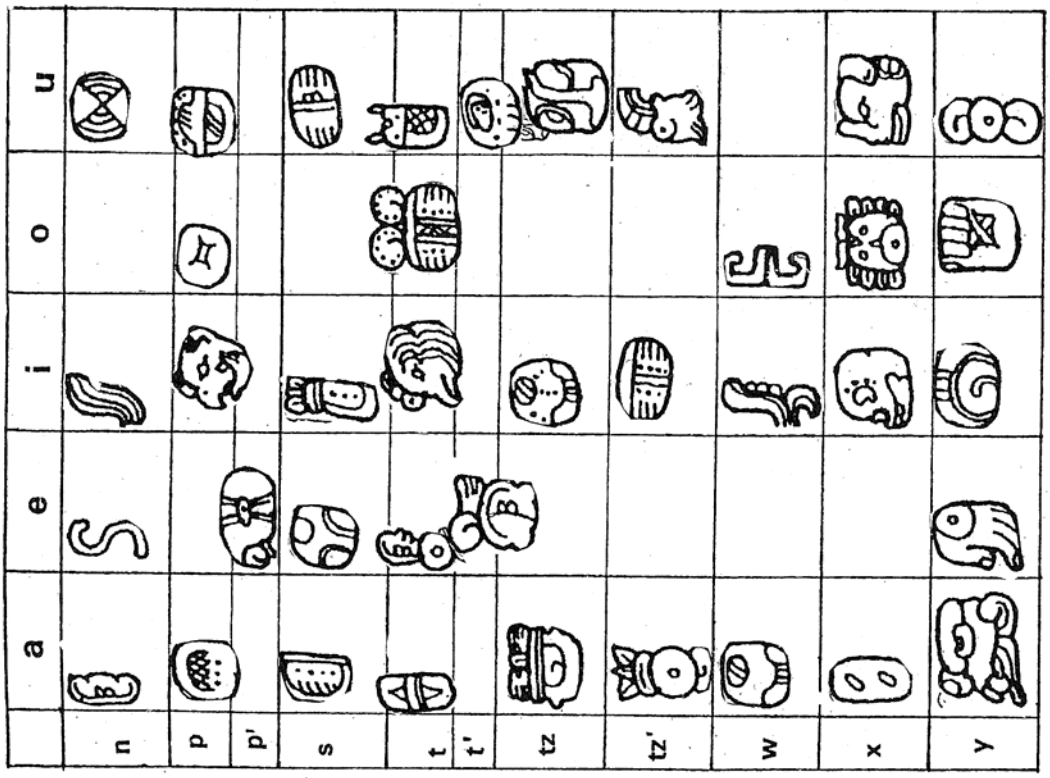
5. Now put the glyphs for your name to replace the English syllables in their own name into one of these block arrangements:

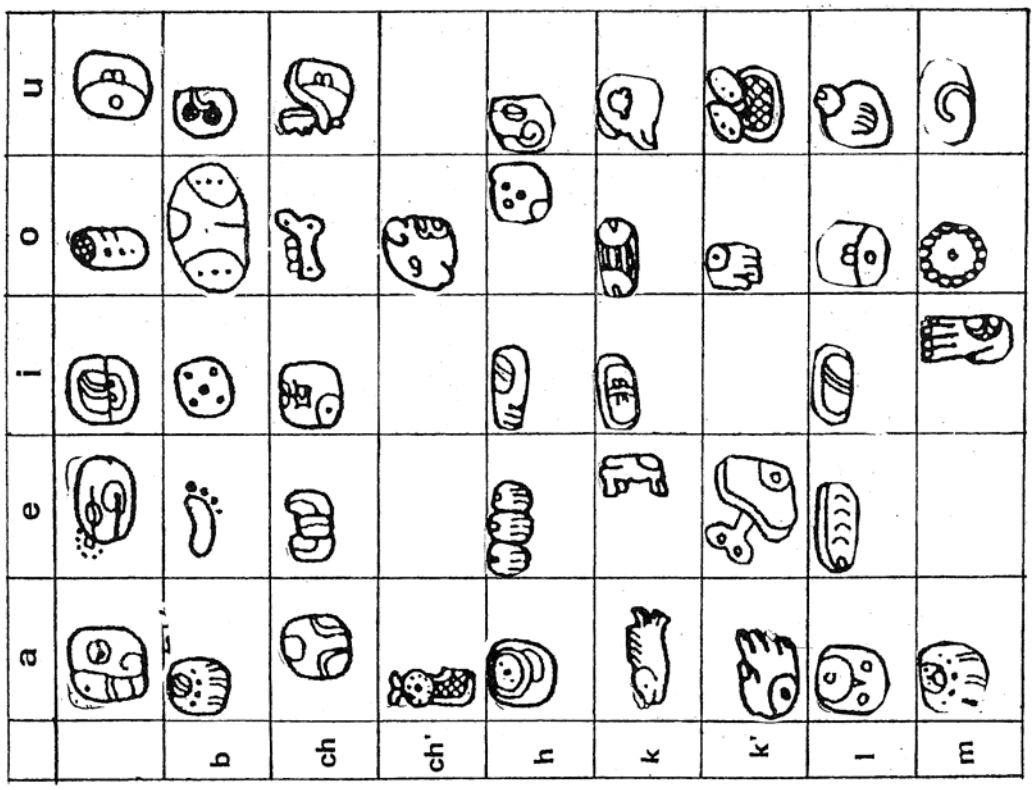


6. Then, use a sheet of brown paper to copy your name to add to the stelae.

Prepared by Indiana University of Pennsylvania, Anthropology Department and Archaeological Services, for more information, visit our website http: / /www .chss. iup. edul anthropology/

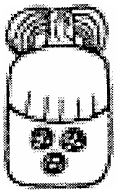
Maya Syllabary





Worksheet 3 Maya Animals

Animal name in English	Animal Name in Maya	Maya name divided into syllables
Armadillo	*ibach*	*i-ba-ch(e)*
Vulture	*kuch*	*ku-ch(i)*
Jaguar	*jix*	*ji-IX*
Bird	*muwan*	*mu-wa-n(a)*
Bat	*sotz*	*So-tz(i)*
Howler monkey	*b'atz'*	*B'a-tz'u*
Spider monkey	*max*	*ma-xi*
Tapir	*Til*	*ti-li*
Fish	*kay*	*ka*
Crocodile or lizard	*aym*	*a-yi-n(e)*


jix

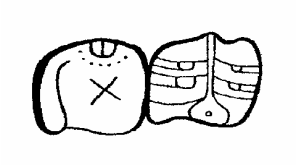

muwan


Max


tapir


Kay


ain



Worksheet 4 Animal Names

Use the Maya/English dictionary catalogue on the Foundation for Mesoamerican Studies website (http://www.famsi.org) to find the Maya name for these animals. Then translate the Maya name into glyphs using the syllabery (Worksheet 2)

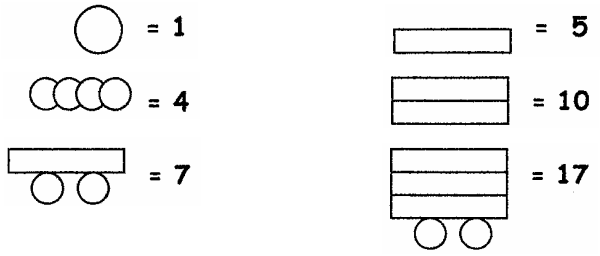
Turkey	cutz	
Bat		
Jaguar		
Parrot		
Vulture		
Fish		

Worksheet 5 Maya Words

English	Maya	Glyph
Flint knife	tok’	
Bundle (package)	pipih	
Chocolate or cacao	kakaw	
House	otot	
Plate	Lak	
Bowl	Jay	

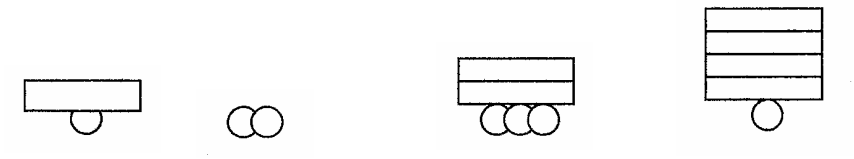
Maya Numbers

The Maya used a numbering system based on multiples of 20 instead of 10 like we use. You can think of this difference in that the Maya used their fingers and toes for counting instead of just their fingers.) Instead of 10 symbols to represent numbers (0, 1, 2, 3, 4, 5, 6, 7, 8, 9), the Maya used bars and dots, like these:



The Maya also used a symbol for zero :

What are these numbers?



_____ _____ _____ _____

See how many Maya numbers you can identify in the handout of the stela from Piedras Negras, by coloring all the numbers you find.

Maya Calendars

When we write a date, like January 6, 2002, we are using shortcuts to describe how long a period of time has passed since the date the calendar started in millennia, centuries, decades, years, months and days .

How many of each of these periods is represented by January 6, 2002?

	January 6, 2002, means
A millennium = 1,000 years	2 millennia (2,000 years or 730,500 days since 0 A.D.)
A century = 100 ears	0 centuries
A decade = 10 years	0 decades
A year = 1 year	2 years (365 days x 2 = 730 days)
A month = 30 (28 or 31) days	January = 0 completed months
A day = 24 hours	6th = 6 days
	So 731,236 days have passed since the calendar began.

The Maya used categories for their calendars that are based on their base 20 number system.

	January 6, 2002,would be written by the Maya as 12.19.9.5.4 meaning
Bak'tuns = 20x20 years or 20 K'atuns or 400 years	12 Bak'tuns (or 4800 years or 1,728000 days)
K'atuns = 20 years or 20 tuns	19 k'atuns (19 x 20 years or 380 years or 136,800 days)
Tun = 1 year of 360 days or 18 Winais	9 tuns (9 years or 9,<360 days or 3,240 days)
Winals = 20 days (months) or 20 K'jns	5 winals *(5x20* days or 100 days)
K'in = 1 day	4 k'ins (4 days)
	So how many days have passed since the calendar began?

Write your answer here_____

The Maya used symbols to represent bak'tuns, k'atuns, tuns, winals, and k'ins along with symbols that gave each day its own name.

January 6, 2002

Here's how January 6. 2002 would be written on a **Maya stela:**

In the year of

12 bak'tuns

19 k'atuns

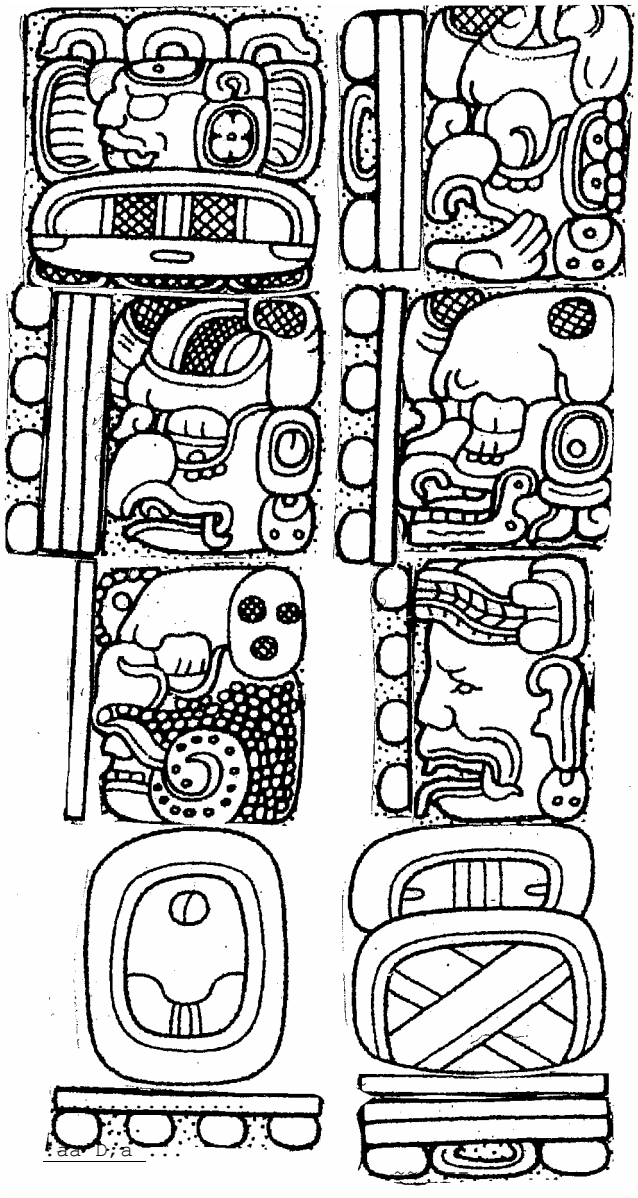
9 tuns

5 winals

4 kins

9 kan

17 zip



Using brown paper and the glyph blocks, make your own stela. You can color the numbers and glue them to the sheet!

Prepared by Indiana University of Pennsylvania, Anthropology Department and Archaeological Services, for more information, visit our website: http://www.chss.iup.edulanthropology/

Lesson Plan #14

Title of Lesson: Comparing Written Communication Systems

Grade Level(s): 4, 5, 6, and 7

Content Area(s): Social studies, history, and communication

Skills Addressed(s): Verbal communication, critical thinking, research, pattern recognition, and cooperation

Main Concept: There are similarities, as well as differences, in the way cultures address written communication needs.

Objective(s): Students will be able to use (apply) what they learned in previous lessons to identify patterns of similarities as well as differences among symbolic communication systems.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies – I.a., II.c., II.e.
Grade 5 Social Studies - I.a., I.c.; II.d.; V.a.
Grade 6 Social Studies - I.a., I.c.; II.d.; V.a.

Pennsylvania Department of Education (PDE):

Grade 7 History – 8.4.9 B

Materials/Equipment:

*Blank graphic organizer template (one for each cooperative group)
*Completed graphic organizer template (for teacher only)
*Student Text Chapters 11, 12, and 13 (one for each student)
*Poster board and drawing materials (one for each cooperative group)

Anticipatory Set:

1. Ask students, "Why is communication among people in a culture important?"

> **Note**: Let students brainstorm their ideas. The purpose of this question is to get them thinking that communication in a culture is important.

2. Ask students, "What are the different ways that people can communicate with each other?"

> **Note**: Expect answers such as telephone, television, e-mail, pda, cell-phone, newspapers and magazines, letters, speech or talking, writing, books, etc. (Don't forget body language and facial expression as forms of communication.)

3. Ask students, "For what purposes do we use writing in our culture?"

> **Note:** Students will answer in a variety of ways: to write down ideas and important historical events, keep public records (birth, death, diplomas, marriage, parking tickets, etc.), write down laws so that everybody sees them the same way, keeping business records and family histories, for product promotion (commercials), highway signs, books for entertainment, etc. Guide the conversation into these areas if students have trouble responding.

4. Tell students that they will be comparing written communication systems that have been studied by archaeologists in three different parts of the world to our own system.

Procedure:

1. Divide students into cooperative groups (4-5 students).

2. Distribute blank Graphic Organizer to each group.

3. Tell students to write PA Rock Art, Egyptian Hieroglyphics, Maya Glyphs, and Our Classroom at the top of the right four columns of the graphic organizer.

4. Ask students, "How are written communications similar or different from each other?"

> **Note**: Let students brainstorm but guide the discussion to include kinds of symbols used (alphabet, pictures, etc.), materials or media used (ink, paper, rocks, pottery, statues, carvings, etc.), tools used (chisels, paint brushes, paint, etc.), how applied (painted, carved, etc.), who were the writers (special scribes, social elders, everybody, only certain classes, only men, etc.), what was being written (lessons, histories, business information, numbers, calendars, etc.), etc.

5. Tell students to mark the rows of the graphic organizer as follows: symbols, media, tools, methods, the writers, what was written, and anything else you feel is important from the previous discussion.

6. Tell students to use the graphic organizer to guide their group assignment (see below).

Closure:

1. Ask students, "What similarities in written communication systems did you discover while doing your assignment?"

2. Ask students "What differences in written communication systems did you discover while doing your assignment?"

3. Ask students, "What important things can archaeologists learn about past cultures by studying the writing systems of those past cultures?"

> **Note**: Let students brainstorm. This is a good way to discover how much they have learned from the previous lessons.

4. Tell students that studying writing systems is not enough. Archaeologists have to study other remains of human behavior as well.

5. Ask students, "What other kinds of evidence should archaeologists use to study past cultures, even if they do have writing systems?"

> **Note**: Starting with Lesson 2, this subject has been covered in almost every lesson plan. This is a good opportunity to see how well the students have remembered what they previously studied.

Assignment:

1. Have each cooperative group complete the graphic organizer by using the following sources:

- Have each cooperative group review the readings in chapters 11, 12, and 13.

> **Note**: Be sure that each student has a copy of the student text.

- Students may use the library or Internet to provide additional information if they choose.

2. Have each group create a poster comparing the written communication systems highlighted in the graphic organizer.

3. Display each poster in the classroom or library for other students to enjoy.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials can be assembled in a student/group portfolio.

Adaptations:

To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If possible, go around the room, at least once. You can go around more times, if the class has more to say. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow

them to answer when they raise their hand. Students who had no answer often think of one later and should be given the opportunity to answer when they raise their hands. Please give the students enough time to think about an answer before you start around the room. This approach forces all students to think of an answer instead of relying on the hand-full who always raise their hand first, whether or not they have an answer. Most important, this approach is inclusive of most students in the class. Children who need more time to develop an answer will, therefore, have an opportunity to answer.

Resources/References:

Student Text which accompanies this lesson plan book.

Completed Graphic Organizer Template

	PA Rock Art	Egyptian Hieroglyphics	Maya Glyphs	Our Classroom
Symbols				
Media				
Tools				
Methods				
The Writers				
What Was Written				

Blank Graphic Organizer – To Be Completed by Students in Class

Lesson Plan #15

Title of Lesson: Who Owns the Past?

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social studies, history, stewardship, preservation, and ethics

Skills Addressed(s): Verbal communication, critical thinking, research, and cooperation

Main Concept: Looting of archaeological sites destroys important evidence of the past.

Objective(s): Students will be able to discuss ethical and legal considerations regarding site destruction and looting. They will be able to understand how destruction of archaeological evidence impacts their ability to study past cultures.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies - II.d.
Grade 5 Social Studies - II.d.
Grade 6 Social Studies - II.b.

Pennsylvania Department of Education (PDE):

Grade 7 History - 8.1.9 A
Grade 8 History - 8.2.9 B

Materials/Equipment:

*Two eight foot lengths of brown butcher type paper
*Magic markers and other types of coloring tools (for use by the class)
*Individual drawing papers for practice and coloring tools
*Masking tape for hanging the brown butcher type paper on the wall
*Scissors and wide black marker (for use by Teacher Only)

Anticipatory Set:

1. Tell students that we create the past in the process of living.

2. Tell students that to celebrate the completion of this unit, the class will create a historical document for future students to study and enjoy.

3. Tell students that they will create two identical rock art panels, one for display in the class, the other for placement in the school library.

Procedure:

- This a lesson within a lesson – **a stealth lesson**. Please read through the whole lesson plan before you decide what you will actually do. Parts of this lesson plan have been tested in a variety of forms. We know it works. But it may be the most emotional lesson your class ever attempts.

1. Tell each student to think of a special picture or symbol to put on the rock art panel. It may be a rock art image, Egyptian hieroglyphic, or Maya glyph found in their student text. Or better yet, it could be something that they create which will represent them, who they are, how they feel, etc.

2. Distribute individual drawing sheets and coloring tools to the students so that they can practice their image.

3. With the help of students, tape the two butcher type paper sheets on the wall.

> **Note:** You **must** have the class make two. One will **not be enough** for the exercise in the closure section.

4. Allow students to take turns drawing their image on each panel.

5. Once the panels are completed, ask the students, "What will students in the future learn about you from this panel?"

6. Tell students that you love the panels and will put them in a safe place. You are sure that children in the future will appreciate their efforts.

> **Note**: Take the panels down and put them in a safe place. You may choose to keep one of the panels up in the classroom for the children to enjoy.

7. Explain the Assignment section to the class.

8. Have the class do the assignment.

Closure:

1. Take out the two panels created by the class in the procedure section and tape them to the wall for everyone to see.

2. Have each group report on their assignment.

3. Have students discuss the questions, "Who should own the past?" "How does destruction of sites and looting of site materials effect your ability as students to learn about the past?"

4. Without warning the students, take a pair of scissors and thick black magic marker and vandalize one of the panels only. Be sure to cut into some drawings while trying to retrieve others.

Note: You will note that the children will be very concerned if their image did or did not survive. Some will become upset because you destroyed their image. Others will be overtly happy that theirs survived. They will be angry, they will be speechless, some may shed a tear. We cannot emphasize enough that you must do this while the students are watching. You cannot do this anonymously. You would be surprised to learn how quickly students will jump to conclusions regarding the perpetrator and try to take action.

5. Ask the students, "How do you feel about what just happened to the panel?"

> **Note**: Let the students express themselves.

6. Ask the students, "How do you think archaeologists feel when evidence of the past is destroyed?"

7. Ask the students, "How do you think many native people (such as Native Americans, Maya, Egyptians, etc.) around the world feel when their sites are destroy, when their archaeological remains are sold to collectors in other parts of the world?"

8. Ask students to brainstorm how they, as students, can help save archaeological sites in Pennsylvania or elsewhere.

9. Tell the students you are sorry about the destruction, but it was part of the lesson. Tell them that they really do have a second panel which they will be able to enjoy and keep for the future.

10. Let the class enjoy something special to make them feel better.

Assignment:

1. Divide students into cooperative groups (4-5 students).

2. Tell students that they will research information about the destruction of archaeological evidence throughout the world as well as learn about the laws designed to protect sites. Part of this destruction occurs because people in many parts of the world are willing to pay a lot of money to own objects from the past.

3. Tell students that many people throughout the world were shocked when the Museum in Baghdad was emptied of all of its contents just a few months ago; when the Taliban

dynamited the huge statues of a Buddha image in Afghanistan several years ago. Yet, everytime someone loots an archaeological site, removes remains out of context for personal profit or pleasure, they are destroying archaeological evidence as well.

4. Divide the cooperative groups into two groups.

5. Have each group in one-half of the class find information about looting of sites, antiquities smuggling, and the antiquities trade .

> **Note**: There is an abundance of information in print media such as *National Geographic*, *Archaeology*, *Archaeology Odyssey*, and even a newspaper such as the *New York Times*. The Internet has ample information, as well as www.saa.org (links and discussions of ethical issues).

6. Have each group in the other one-half of the class find information about state (including Pennsylvania), national, and international laws which try to prevent smuggling and looting.

> **Note**: Many State Historic Preservation Offices (SHPO) have web sites through which this information can be accessed. The United Nations web site as well as the web sites of specific countries may have this information available. In Pennsylvania, the Bureau for Historic Preservation in Harrisburg, the National Park Service in Gettysburg and Philadelphia are all good sources of information. The SAA web site cited above can help as well.
>
> **Note**: You may choose to subdivide the sources of information among the students.

7. Have each group present a report on what they discovered in the closure section.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials can be assembled in a student/group portfolio.

Adaptations:

To ensure that each student will have an opportunity to answer a question, go around the room, in seating order, asking each child his or her idea. If you have stopped in mid-class, start the next round of questions at the point where you stopped.

Suggestion:

Before, starting the discussion, instruct students to say, "pass" if they have nothing to contribute. Tell them to raise their hand when they do think of something, and allow them to answer when they raise their hand

Resources/References:

Lesson adapted from: Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. Chapter 20, "Rock Art Three: Protecting Our Past" In *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades.* United States Department of the Interior, Bureau of Land Management, 1993.

Lesson Plan #16

Title of Lesson: The Time Line

Grade Level(s): 4, 5, 6, 7, and 8

Content Area(s): Social studies and history

Skills Addressed(s): Chronological thinking, organization, and cooperation

Main Concept: A time line is useful for organizing the events and activities of the past.

Objective(s): Students will demonstrate their understanding of chronological thinking by developing a complex time line. They will build a timeline for Pennsylvania and relate this to other events throughout the world.

Standards Addressed (see Appendix A):

National Council for the Social Studies (NCSS):

Grade 4 Social Studies - II.b., II.e.
Grade 5 Social Studies - II.b., II.d.
Grade 6 Social Studies - II.b., II.d.

Pennsylvania Department of Education (PDE):

Grade 7 History - 8.1.0 A
Grade 8 History - 8.2.9 C

Materials/Equipment:

*8 ½ inch by 11 inch multicolored construction paper – (20 papers for each of six continents and Pennsylvania) (a different color for each continent and state)
*twenty 8 ½ inch by 11 inch papers, a ruler, and black magic marker
*Glue
*Coloring tools such as crayons or pencils
*Colored markers
*Images cut from magazines and newspapers, or downloaded and cut from the Internet
*Masking tape for wall safety

Anticipatory Set:

1. Tell students they will be physically building a room-sized time line in the classroom.

- This can start at the beginning of Section 2 and continue through Section 3.

- This can be a culminating project, undertaken at the end of Section 2 or Section 3 when all the lessons have been completed.

2. Tell students that while you study Pennsylvania history before the Europeans came, you will be identifying some events that are happening around the world at the same time. There were people living in most livable parts of the world when Pennsylvania was first settled.

3. Tell students that when they finish the time line, they will have a better idea about how similar to and how different from each other human cultures can be, at the same points in time.

4. Tell the students to think of the time line as a puzzle which they will assemble, one block at a time.

5. Take the white pieces of paper and draw an 11 inch line down the middle with a magic marker, using a ruler. Write the dates represented by each paper above or below each line.

> **Note**: You the teacher can do this, but have your students help in taping the different white blocks together, in the right order, on the wall.

Procedure:

1. Divide students into cooperative groups or student pairs.

> **Note**: Groups will have multiple assignments throughout.

2. Tell students that they will be building a time line for Pennsylvania and the six inhabited continents.

3. Assign a particular block of time for a particular continent to each group, starting with the year 20,000.

> **Note**: Each 11 inch side on the paper represents 1,000 years. 20 papers, side-by-side are 20,000 years.

> **Note**: Choose a different color for each continent and for the state of Pennsylvania. Remember, an important part of the lesson is relating events in Pennsylvania to other parts of the world.

4. Assign one cultural unit of Pennsylvania time to each cooperative group or student pair.

> **Note**: Your choices are Paleo-Indian, Archaic, Early Woodland, Middle Woodland, Late Woodland, and early historic.

5. Tell students that as they are learning about a particular cultural period in Pennsylvania, they will be researching cultural events that are happening during their assigned time on their assigned continent.

> **Note**: Students may end up doing a block for Pennsylvania as well as their continent.

6. Tell students to put pictures and write short statements, the dates, which represent their assigned block of time and space, on the appropriately colored piece of paper.

7. Help students place their papers at the appropriate spot on the classroom wall.

> **Note:** This time line is being built a block at a time, not all at once. As you complete a particular section on Pennsylvania culture, the students should put the blocks in their appropriate spot.
>
> **Note**: If you are doing the Pennsylvania culture lessons quickly, then the blocks will be assembled more quickly or at the same time. Only you the teacher knows your time frame and capabilities of the class.

Closure:

- Discuss similarities and differences in cultural behavior as the timeline unfolds and grows around the room.

> **Note**: The placement of time line blocks is a wonderful opportunity for students to give short report explaining their blocks. It is also an opportunity for students to reflect on what they are building continent by continent means.

Student Evaluation:

Evaluate students on their participation, effort, quality of writing/presentation, and discussion. These materials can be assembled in a student/group portfolio.

Adaptations:

Cooperative groups of 4-5 students may be too large for this ongoing exercise. Students properly paired may have a better opportunity for input in this exercise.

Reference:

Lesson adapted from: Wolynec, Renata, et al. *Project Archaeology: Pennsylvania, An Archaeology Curriculum for Middle School Grades Five Through Eight*. Pennsylvania Archaeological Council, 1995.

APPENDIX A

Educational Standards Appropriate to the Teaching and Learning Materials in Project Archaeology: Pennsylvania Standards Based Curriculum Project

The following recommendations were developed for the project by curriculum development specialist Daniel J. Shelley, Ph. D.

- **Recommendations for Fourth Grade Curriculum Units**

A. Classic goals of Fourth Grade Social Studies:

(1) Exploring your state
(2) Comparing your area to other world regions

B. Relevant Standards: National Council for the Social Studies (NCSS) Standards Addressed - Based on Current I-X (see NCSS standards: www.ncss.org):

I. Culture

a. explore and describe similarities and differences in the ways groups, societies, and cultures address similar human needs and concerns
c. describe ways in which language, stories, folktales, music, and artistic creations serve as expressions of culture and influence behavior of people living in a particular culture
d. compare ways in which people from different cultures think about and deal with their physical environment and social conditions

II. Time, Continuity, and Change

c. compare and contrast different stories or accounts about past events, people, places, or situations, identifying how they contribute to our understanding of the past
d. identify and use various sources for reconstructing the past, such as documents, letters, diaries, maps, textbooks, photos, and others
e. demonstrate and understanding that people in different times and places view the world differently

III. People, Places, and the Environments

g. describe how people create places that reflect ideas, personality, culture, and wants and needs as they design homes, playgrounds, classrooms and the like

h. examine the interaction of human beings and their physical environment, the use of land building of cities, and ecosystem changes in selected locales and regions

IV. Individual Development and Identity

a. describe personal changes over time, such as those related to physical development and personal interests

c. describe the unique features of one's nuclear and extended families

e. identify and describe ways family, groups, and community influence the individual's daily life and personal choices

V. Individuals, Groups, and Institutions

a. identify roles as learned behavior patterns in group situations such as student, family member, peer play, group member, or club member

b. give examples of and explain group and institutional influences such as religious beliefs, laws, and peer pressure, on people, events, and elements of culture

• Recommendations for Fifth Grade Curriculum Units

A. Classic goal of Fifth Grade Social Studies:

(1) People of the Americas: The United States and its close Neighbors

B. Relevant Standards: National Council for the Social Studies (NCSS) Standards Addressed - Based on Current I-X (see NCSS standards: www.ncss.org):

I. Culture

a. compare similarities and differences in the ways groups, societies, and cultures meet human needs and concerns

c. explain how information and experiences may be interpreted by people from diverse cultural perspectives and frames of reference

d. explain why individuals and groups respond differently to their physical and social environments and/or changes to them on the basis of shared assumptions, values, and beliefs

II. Time, Continuity, and Change

b. identify and use key concepts such as chronology, causality, change, conflict, and complexity to explain, analyze, and show connections among patterns of historical change and continuity

d. identify and use processes important to reconstructing and reinterpreting the past, such as using a variety of sources, providing, validating, and weighing evidence for claims, checking credibility of sources, and searching for causality

III. People, Places, and the Environments

a. elaborate on mental maps of locales, regions, and the world that demonstrate understanding of relative location, direction, size, and shape

g. describe how people create places that reflect cultural values and ideals as they build neighborhoods, parks, shopping centers, and the like

h. examine, interpret, and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs and ideas, and ecosystems

k. propose, compare, and evaluate alternative uses of land and resources in communities, regions, nations, and the world.

IV. Individual Development and Identity

b. describe personal connections to place-as associated with community, nation, and world

c. describe the ways family, gender, ethnicity, nationality, and institutional afflictions contribute to personal identity

e. identify and describe ways regional, ethnic, and national cultures influence individuals' daily lives

V. Individuals, Groups, and Institutions

a. demonstrate and understanding of concepts such as role, status, and social class in describing the interactions of individuals and social groups

b. analyze group and institutional influences on people, events, and elements of culture

• Recommendations for Sixth Grade Curriculum Units

A. Classic Goal of Sixth Grade Social Studies:

(1) People and Cultures: The Eastern Hemisphere

B. Relevant Standards: National Council for the Social Studies (NCSS) Standards Addressed - Based on Current I-X (see NCSS standards: www.ncss.org)

I. Culture

a. compare similarities and differences in the ways groups, societies, and cultures meet human needs and concerns

c. explain how information and experiences may be interpreted by people from diverse cultural perspectives and frames of reference

d. explain why individuals and groups respond differently to their physical and social environments and/or changes to them on the basis of shared assumptions, values, and beliefs

II. Time, Continuity, and Change

b. identify and use key concepts such as chronology, causality, change, conflict, and complexity to explain, analyze, and show connections among patterns of historical change and continuity

d. identify and use processes important to reconstructing and reinterpreting the past, such as using a variety of sources, providing, validating, and weighing evidence for claims, checking credibility of sources, and searching for causality

III. People, Places, and the Environments

a. elaborate on mental maps of locales, regions, and the world that demonstrate understanding of relative location, direction, size, and shape

d. estimate distance, calculate scale and distinguish other geographic relationships such as population density and spatial distribution patterns

g. describe how people create places that reflect cultural values and ideals as they build neighborhoods, parks, shopping centers, and the like

h. examine, interpret, and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs and ideas, and ecosystems

k. propose, compare, and evaluate alternative uses of land and resources in communities, regions, nations, and the world.

IV. Individual Development and Identity

b. describe personal connections to place-as associated with community, nation, and world

c. describe the ways family, gender, ethnicity, nationality, and institutional afflictions contribute to personal identity

f. identify and describe ways regional, ethnic, and national cultures influence individuals' daily lives

V. Individuals, Groups, and Institutions

a. demonstrate and understanding of concepts such as role, status, and social class in describing the interactions of individuals and social groups

b. analyze group and institutional influences on people, events, and elements of culture

• Recommendations for Seventh Grade Curriculum Units (World History)

Based on PDE Academic Standards for History and Geography (2001-2002)

PA Overall goal of Seventh Grade Social Studies:

Pennsylvania public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to analyze the interaction of cultural, economic, geographic, political and social relations.

Selected Pennsylvania Academic Standards for History (project specific):

(8.1) Historical Analysis and Skills Development

(8.1.9 A) Analyze chronological thinking.

- Difference between past, present and future
- Data presented in time lines
- Continuity and change

(8.1.9 B) Analyze and interpret historical comprehension.

- Literal meaning of historical passage
- Different historical perspectives

(8.1.9 C) Analyze the fundamentals of historical interpretation.

- Fact versus fiction
- Reasons/causes for multiple points of view

(8.4) World History

(8.4.9 A) Analyze the importance of individuals who have made a difference in the history of the world from the beginning of recorded history to 1500.

- Political and Military Leaders (e.g., Cesar, Hannibal, Xerxes)
- Reformers and Innovators (e.g., Archimedes, Confucius, Gutenberg)

(8.4.9 B) Identify and analyze the importance of historical evidence.

- Documents (e.g., Magna Carta, Koran, Bible, Dead Sea Scrolls)
- Artifacts (e.g., megaliths at Stonehenge, Mayan Pyramids, Easter Island)

(8.4.9 C) Analyze how continuity and change throughout history has impacted commerce and industry, innovations, settlement patterns, social organizations, transportation and roles of women.

- Africa (e.g., Nubia, Phoenician Colonies, Bantu, Ghana, Songhai, Mali)
- Americas (e.g., Chavin, Olmec, Maya, Toltec, Aztec)
- Asia (e.g., Mesopotamia, Assyria, Mongol Empires, Islam, Guptas)
- Europe (e.g., Greek settlements, Gaul, Roman Empire, Vikings)

(8.4.9 D) Analyze the impact of religion and philosophical belief systems on cultures.

- Religions (e.g., Bahai, Buddhism, Christianity, Hinduism, Shinto, Taoism, Judaism)
- Early Belief systems (e.g., mythology, polytheism, ancestor. Worship, mysticism)

(8.4.9 E) Analyze how conflict and cooperation impacted world history through 1500.

- Domestic instability (e.g., bubonic plague, Orthodox Church breaks with Rome)
- Labor relations (e.g., Yellow Tubans, Japanese feudalism, slavery)
- Racial and ethnic relations (e.g., Arab language imposed in India)
- Immigration and migration (e.g., Nordic people enter Southern Europe, Mayan migrates north to Yucatan)
- Military conflicts (e.g., Mongol expansion, Islamic conquests, Christian crusades, 100 years war)

Selected Pennsylvania Academic Standards for Geography (project specific):

(7.3) The Human Characteristics of Places and Regions
(7.3.9 A) Explain the human characteristics of places and regions by their population characteristics.

- Spatial distribution, size, density and demographic characteristics of population at the state and National level
- Demographic structure of a population (e.g., life expectancy, fertility rate, morality rate, infant mortality rate, population growth rate, the demographic transition model)
- Effects of different types and patterns of human movement:
  Mobility (e.g., travel for business)
  Migration (e.g., rural to urban, short term vs. long term, critical distance)

(7.3.9 B) Explain the human characteristics of places and regions by their cultural characteristics.

- Ethnicity of people at national levels (e.g., customs, celebrations, languages, religions)
- Culture distribution (e.g., ethnic enclaves and neighborhoods)
- Cultural diffusion (e.g., acculturation and assimilation, cultural revivals of language)

• Recommendations for Eighth Grade Curriculum Units (Pennsylvania History)

Based on PDE Academic Standards for History and Geography (2001-2002)

PA Overall goal of Eighth Grade Social Studies:
Pennsylvania public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to analyze the interaction of cultural, economic, geographic, political and social relations.

Selected Pennsylvania Academic Standards for History (project specific):

(8.2) Pennsylvania History
(8.2.9 A) Analyze the importance of individuals and groups who have made a difference in Pennsylvania from 1787 to1914.

- Political Leaders
- Military Leaders
- Cultural and Commercial Leaders
- Innovators
- Reformers

(8.2.9 B) Identify and analyze the importance of historical evidence in Pennsylvania.

- Documents, writings and oral traditions (e.g., Pennsylvania Constitutions of 1838 and 1874, The Gettysburg Address)

- Artifacts, architecture and historic places (e.g., Wheatland, Custom House in Erie, Girard College, Penal Institutions, Gettysburg, Eckley Miners Village, Drake's Well, Allegheny Courthouse, Valley Forge State Park, State Capitol Buildings, Watercraft)
- The Arts and Culture (e.g., Mary Cassatt, Thomas Eakins, Stephen Foster, The State Coat of Arms, decorative arts)

(8.2.9 C) Analyze continuity and change in the history of Pennsylvania.

- Commerce and industry (i.e., coal, iron, petroleum, timber, manufacturing)
- Education (e.g., the Free School Act of 1834, creation of the public high school system in the state in 1887, prohibition of racial discrimination in schools)
- Innovations (e.g., the steel-tipped plow, the mechanical reaper, iron and steel and glass, Cyrus McCormick and the reaper)
- Settlement Patterns (e.g., farms and growth of urban centers)
- Social organization (e.g., the Philadelphia Centennial Exposition of 1876)
- Transportation (e.g. Railroad systems, Pennsylvania canals, John Roebling's Steel Cable, locomotives, Thompson's Horseshoe Curve)
- Women's Movement (e.g., work of the Equal Rights League of Pennsylvania)

(8.2.9 D) Analyze conflict and cooperation impacting Pennsylvania History.

- Domestic instability (e.g., impact of war, the 1889 Johnstown Flood)
- Racial and ethnic relations (e.g., the Underground Railroad, Christiana riots, disenfranchisement and restoration of the suffrage for African-Americans, Carlisle Indian School)
- Immigration (e.g., Anti-Irish Riot of 1844, new waves of immigrants)

Selected Pennsylvania Academic Standards for Geography (project specific):

(7.3) The Human Characteristics of Places and Regions

(7.3.9 C) Explain the human characteristics of places and regions by their settlement characteristics.

- Current and past settlement patterns in Pennsylvania and the United States
- Forces that have re-shaped modern settlement patterns (e.g., central city decline, sub urbanization, the development of transport systems)

(7.3.9 D) Explain the human characteristics of places and regions by their economic activities.

- Spatial distribution of economic activities in Pennsylvania and the United States (e.g., patterns of agriculture, forestry, mining, retailing, manufacturing, services)
- Technological changes that affect the definitions of, access to, and use of natural resources (e.g., the role of exploration, extraction, use and depletion of resources)

APPENDIX B

Meet an Archaeologist – Speakers List

Each year, in October, Pennsylvania celebrates its hidden heritage during Archaeology Month. Archaeological sites are found throughout the Commonwealth. Some of these are prehistoric camps of villages, others are left from the colonial period, and still others are remnants of our recent industrial heritage. Archaeological sites are found in every Pennsylvania County and Township, along rivers and streams, in rock shelters, and on hilltops. This brochure has been developed by the archaeologists in the state to provide the Commonwealth's teachers with access to the archaeology in your communities. It contains two lists. One is a list of archaeologists in Western Pennsylvania while the other is a list of archaeologists in Central and Eastern Pennsylvania all of whom are available to visit your classroom and present a program about archaeology. To arrange for a speaker, contact the individual speaker directly. To arrange for one of the exhibits, contact Dr. Beverly Chiarulli, IUP Archaeological Services, McElhaney Hall room G12, 441 North Walk, Indiana PA 15705-1087. Telephone number: (724) 357-7623 or (724) 357-2659, email: bevc@iup.edu

Western Pennsylvania

1. Dr. Anthony Boldurian
University of Pittsburgh at Greensburg
Anthropology Department
Smith Hall B-14
(724) 836-9989
FOLSOM+@pitt.edu
Area: Greensburg, Westmoreland Counties
Topics: *Early Man
*Pennsylvania Archaeology

2. Dr. Diane Beynon Landers
GAI Consultants, Inc.
570 Beatty Rd.
Monroeville, PA 15146
(412) 856-9220
d.landers@gaiconsuItants.com
Area: Western Pennsylvania
Topic: *Historic and Prehistoric Cemeteries www.gaiconsultants.com

3. Karen Orrence M.A.
GAI Consultants, Inc.
570 Beatty Rd.
Monroeville, PA 15146
(412) 865-9220
Area: Allegheny County, specifically Pittsburgh
Topics: *Urban Archeology
*Gettysburg and the Civil War

4. Dr. Doug MacDonald
GAI Consultants, Inc.
570 Beatty Rd.
Monroeville, PA 15146
(412) 865-9220 ext. 1375
Area: Allegheny County
Topic: *Late Woodland Prehistory of Northwestern Pennsylvania

5. Dr. Beverly Chiarulli Indiana University of Pennsylvania
Archaeological Services
McElhaney Hall, Room G12
441 North Walk
Indiana, PA 15705-1087
(724) 357-2659 bevc@grove.iup.edu
Area: Western Pennsylvania
Topics: *Mayan Archaeology
*Pennsylvania Before Columbus
*Project Archaeology: PA
*Teacher Workshops and In-Service Programs

6. Dr. Phil Neusius
Indiana University of Pennsylvania
Department of Anthropology
McElhaney Hall, Room G12
441 North Walk
Indiana, PA 15705-1087
(724) 357-2733 phun@grove.iup.edu
Area: Indiana and Surrounding Counties
Topics: *Cultural Resources
*Flintknapping

7. Dr. Sarah Neusius
Indiana University of Pennsylvania
Department of Anthropology
McElhaney Hall, Room G12
441 North Walk
Indiana, PA 15705-1087
(724) 357-2133 sawn@grove.iup.edu
Area: Indiana and Surrounding Counties
Topics: *Zooarchaeology
*Eastern North American Prehistory
*Historic Preservation

8. Anthropology Students Indiana University of Pennsylvania
Anthropology Department
McElhaney Hall, Room G12
441 North Walk
Indiana, PA 15705-1087
Area: Elementary Schools in Indiana, PA

9. Dr. John Nass
California University of Pennsylvania
Social Science Department
California, PA 15419 (724) 928-4042
nass@cup.edu
Area: Washington, Fayette

10. Richard Kandare Allegheny National Forest P.O. Box 847
Warren, PA 16365
(814) 723-5150
rkandare/ r9allegheny@fs. fed.gov
Area: Allegheny National Forest
Topic: *Prehistoric and Historic Archaeology In the Allegheny National Forest

11. Jack McLaughlin
Allegheny National Forest
Bradford Ranger District
Star Route 1
P.O. Box 88 Bradford, PA 16701
Area: Allegheny National Forest
Topic: *Prehistoric and Historic Archaeology In the Allegheny National Forest

12. Dr. Renata B. Wolynec
Edinboro University of PA
Department of History and Anthropology
Edinboro, PA 16444
(814) 732-2573
wolynec@edinboro.edu
Area: Erie, Crawford, Warren Counties
Topics: *What is Archaeology
*Archaeological Investigations at the Waterford Historical Complex
*Project Archaeology Teacher Workshops
*Additional topics by special arrangement).

13. Paula Zitzler
Westsylvania Heritage Development Corporation
P.O. Box 565
105 Zee Plaza
Holidaysburg, PA 16648
(814) 696-9380 pzitzler@msn.com
Area: Western Pennsylvania
Topic: *What Do Archaeologists Do?

Central and Eastern Pennsylvania

1. Speakers from the Bureau For Historic Preservation
Dr. Kurt Carr (717) 783-8946
Ms. Noel Stratton (717) 772-4519
Bureau For Historic Preservation
Commonwealth Keystone Building
400 North St. 2nd floor
Harrisburg, PA 17120-0093
Area: Dauphin and Surrounding Counties
Topics: *Pennsylvania Prehistory
*Historic Archaeology

2. Dr. Robert Wheelersburg
Elizabethtown College
Elizabethtown, PA 17022
(717) 361-1188
wheelersburg@etown.edu
Area: Lancaster, Lebannon, Deleware Counties
Topics: *Historical Archaeology in the Commonwealth Area
*Scandinavian Archaeology

3. Dr. Marshall Becker
West Chester University
Department of Anthropology
West Chester, PA 19383
(610) 436-2884 mbecker@wcupa.edu
Area: Eastern Pennsylvania
Topic: *The Lenape: The Archaeology of the First Pennsylvanians

4. Richard Geidel
KCI Technologies, Inc.
5001 Louise Drive Suite 201
Mechanicsburg, PA 17055
(717)-691-1340 rgeidel@kci.com
Area: Central Pennsylvania
Topic: *Pennsylvania Prehistory

5. Gary F. Coppock,
Heberling Associates, Inc.
415 Mifflin Street , Huntingdon, PA 16652
(814) 349-5321 coppock@uplink.net
Area: Center and Surrounding Counties
Topic: *Pennsylvania Prehistory

6. Dr. Pat Miller
KCI Technologies, Inc.
5001 Louise Drive Suite 201
Mechanicsburg, PA 17055
(717)691-1340
pemi Iler@co mpuserve.com
Area: Central Pennsylvania
Topic: *Pennsylvania Prehistory
Paleo-Indian Sites

7. Dr. Hope E. Luhman
P.O. Box 168
Mount Tremper, NY 12457
(914)-688-2389
heluhman@lewisburger.com
Area: Lehigh, Northampton, Bucks, Montgomery, Chester, Carbon, Monroe, Schuykill, Berks, Lancaster ,Tioga Counties
Topics: *Historical Archaeology
*The Henry Gunsmiths of Pennsylvania
*Moravian History and Archaeology

8. Ms. Elizabeth Neaves
University of Pennsylvania
The University Museum of Archaeology and Anthropology
33rd and Spruce Street
Philadelphia, PA 19104
(215) 898-4016
neavesst@ sas .upenn.edu
Area: Eastern Pennsylvania
Topic: *Native American Storytelling
*Messengers of the Wakan Tanka in Sioux Society and Cosmology

An additional list of speakers and topics is located at www.upenn.edu/museum. Programs are coordinated by Ms. Neaves.

Visit the Archaeology Month Website at
www.pennarchaeologymonth.org