Fill In The Blanks

MASTER TEACHERS	**Paul Beavers and Paul Fleming**
LESSON TITLE	Fill In the Blanks
GRADE LEVELS	This lesson was designed for 8th grade students, but can be modified for other grade levels.
TIME ALLOTMENT	This lesson was designed to fill one 55-minute class period.
OVERVIEW	This is an introductory lesson to the "tools" used by archeologists. The emphasis is placed on the talents that are not always associated with archeologists and scientists, such as creativity and imagination. Through the use of video, Internet resources and hands-on activities, students will attain a good understanding of what archeology does to help historians put together a complete picture of the past.
SUBJECT MATTER	Social Studies
LEARNING OBJECTIVES	Students will be able to: • Identify the tools used in archeology. • Explain the importance of archeology to creating an accurate picture of the past. • Interpret data collected by archeologists. • Explain the importance of creativity and imagination to archeologists, scientist, and historians.
STANDARDS	**National Standards:** **National Standards for History** http://www.sscnet.ucla.edu/nchs/standards/thinking5-12-2.html 2 - Historical Comprehension B. Reconstruct the literal meaning of a historical passage by identifying who was involved, what happened, where it happened, what events led to these developments, and what consequences or outcomes followed. D. Differentiate between historical facts and historical

interpretations but acknowledge that the two are related; that the facts the historian reports are selected and reflect therefore the historian's judgement of what is most significant about the past.
http://www.sscnet.ucla.edu/nchs/standards/thinking5-12-3.html
3 - Historical Analysis and Interpretation
D. Draw comparisons across eras and regions in order to define enduring issues as well as large-scale or long-term developments that transcend regional and temporal boundaries.
E. Distinguish between unsupported expressions of opinion and informed hypotheses grounded in historical evidence.
F. Compare competing historical narratives.
H. Hold interpretations of history as tentative, subject to changes as new information is uncovered, new voices heard, and new interpretations broached.
I. Evaluate major debates among historians concerning alternative interpretations of the past.
J. Hypothesize the influence of the past, including both the limitations and the opportunities made possible by past decisions.

State Standards:
Social Studies - TN
http://www.state.tn.us/education/ci/cistandards2001/ss/ciss68standards.htm
Geography – 8th Grade
3.03 Recognize the interaction between human and physical systems.
3.05 Understand the impact of immigration and migration on a society.
8.3.tpi.6 illustrate examples of communities who changed or adapted their physical environment to meet their societal needs.
8.3.tpi.8 explain how environmental issues such as water supply and resource availability influenced historical events and developments.
History
5.01 Identify ancient civilizations of the Americas.
5.03 Use historical information acquired from a variety of sources to develop critical sensitivities such as skepticism regarding attitudes, values, and behaviors of people in different historical contexts.
8.5.spi.2 Read a timeline and order events of the past.

MEDIA COMPONENTS

VIDEO

PBS Video

NOVA: "Mystery of the First Americans"

BOOKS

A History of US: The First Americans -"In The Beginning" by Joy Hakim

WEB SITES

Journeys of The First Americans

http://www.tpwd.state.tx.us/edu/indian/journey.htm

This web page shows a map of the path that the first Americans might have used to enter the continent.

NOVA Online: Mystery of The First Americans

http://www.pbs.org/wgbh/nova/first/

This is the interactive companion web site for the video used in the lesson. It covers everything from the historic existence of race to dating artifacts.

"Meet Kennewick Man"

http://www.pbs.org/wgbh/nova/first/kennewick.html

This site allows students to study Kennewick Man by rearranging the view of his reconstructed head and exploring greater details. (This site requires a QuickTime plug-in.)

Close Encounters (of the Cosmic Kind)

http://www.pbs.org/wgbh/nova/first/radiocarbonce.html

This page explains the ionization part of the carbon dating/aging process.

Eating It (as in Yum) and Eating It (as in Bye-Bye)

http://www.pbs.org/wgbh/nova/first/radiocarbonei.html

This page explains the next step in the carbon dating/aging process.

(My So-Called) Half-Life

http://www.pbs.org/wgbh/nova/first/radiocarbonhl.html

This page walks viewers through the “half-life” process.

Detection Section (What's Your Deflection?)

http://www.pbs.org/wgbh/nova/first/radiocarbonds.html

This page explains the process of determining the ratio between Carbon 12 and Carbon 14 for the carbon dating process.

MATERIALS

PER CLASS: Computers with Internet access, larger paper, plastic copy of a human skull

PER GROUP: (4-6 students/group): 1 paper bag, various objects for students to "observe" in their bags

PER STUDENT: drawing paper, red and blue colored pencil, modeling clay, word bank

PREP FOR TEACHERS

Bookmark and preview all web sites used in this lesson. Access the web sites to familiarize yourself with the various elements that will be studied by the students. Load QuickTime from http://www.pbs.org/wgbh/nova/novatech.html#quicktime for the "**Meet Kennewick Man**" web site. Pay close attention to the information given on the "Jamestown Rediscovery: Cereal Box" web site (Extensions). There is a lot of information that students could share with the class from this site.

Preview and cue the video to the appropriate starting position.
Assemble all student materials.
Make “Mystery Bags” by placing an object in a paper bag for each group.

INTRODUCTORY ACTIVITY: SETTING THE STAGE

Step 1. Introductory Activity #1 - Ask students how they know something is real. (They use their 5 senses) Tell students that we cannot always depend upon having all of our senses to explain, or understand something. In some situations, we may only be allowed to use specific senses. Tell students you have something in a bag (skull) and you want them to take turns reaching inside the bag. They are to use just their sense of touch to try to figure out what they think is in the bag. Hold the bag as students come up and reach in the bag; take a few seconds to feel of the object (the skull) and then go back to their seat.

Step 2. Now tell students to use their blue colored pencil to sketch **exactly** what they think was in the bag. Include as much detail as possible. They are to draw **only** what was in the bag and nothing more.

Step 3. Tell students to think about the object in the bag and think about what was **missing** from the object. Instruct students to use the red colored pencil to sketch what they think was missing from the object (the jaw bone) onto the sketch they have drawn in blue. Check for comprehension by having students share their sketches with the class and spend a couple of minutes discussing what they "saw" in the bag. Then, pull out the object (the skull) and discuss how accurate their sketches were with regards to the actual object

(blue pencil) and the missing part (the jaw/red pencil).

Step 4. Introductory Activity #2 - Divide students in groups (4 or 5 students each) for this activity. Using the **Journeys of the First Americans** web site located at: http://www.tpwd.state.tx.us/edu/indian/journey.htm provide each group with a **FOCUS FOR MEDIA INTERACTION** by asking each to create a question for the following answers: Group 1: Asia Group 2: 13,000-40,000 years Group 3: Layers of ice thousands of feet thick Group 4: Land Bridge was exposed between Siberia and Alaska Group 5: Following the big mammals they hunted. (**Teacher Note:** This will feel a lot like the game Jeopardy.) Once all groups are finished, instruct students to share their "questions." Group 1: Asia (Where did the First Americans come from originally?) Group 2: 13,000-40,000 years (How long ago did the First Americans first arrive?) Group 3: Layers of ice thousands of feet thick (What was most of Asia and North America covered by at this time?) Group 4: Land Bridge was exposed between Siberia and Alaska (What happened when so much of the earth's water was locked up in ice?) Group 5: Following the big mammals they hunted (Why did the First Americans walk across this land bridge?)

Step 5. Make sure students understand that these ideas have been believed for decades (all the way back to the early part of the 20th Century) as the explanation of where the First Americans came from and how they got here. Tell students that in history and in science there are always "blanks" that need to be filled in, much like a fill in the blank test they might take. Historians and scientist are always filling in more and more of the blanks to answer the "how" and "why" questions of history. Tell students that you are going to not only learn about "Filling In The Blanks" to get the most accurate picture of the past, but also what skills and tools are necessary to do this.

LEARNING ACTIVITIES

Step 1. **CUE** NOVA: "Mystery of The First Americans" to the very beginning of the video with the visual of a skull in mud on a river bank and men walking up to it. Provide a **FOCUS FOR MEDIA INTERACTION** by asking students to be able to answer the following question: Based on first observations what did forensic scientists believe the skeleton to be? Gender? Age? Race? **BEGIN PLAY. PAUSE** to check for comprehension after the narrator says, "It seemed like a straight forward case". Ask the students what forensic scientists believed the skeleton to be? Gender? Age? Race? (male, 43, Caucasian) Provide a **FOCUS FOR MEDIA INTERACTION** by asking students to identify how the two discoveries about the skeleton changed their opinion of who the skeleton was. **RESUME PLAY**. **PAUSE** for discussion after the narrator says, "Almost 9,000 years old." What two discoveries about the skeleton changed the opinion of who the skeleton was? (1. Spearhead in the hipbone 2. Radio carbon dating revealed the skeleton to be almost 9,000 years old.) Explain that when we study history, or science we cannot always take things at face value, because things are not always what they appear to be. Historians have to always ask questions and try to find more answers to “Fill In The Blanks.”

Step 2. Have a word bank of words for students to view while you read-a-loud *A History of US: The First Americans* -"In The Beginning" by Joy Hakim. Provide a **FOCUS FOR MEDIA INTERACTION** by telling the students that you are going to leave blanks as you read to them. As you read and leave out words, they are to put a number next to the word they think fits each “blank” you leave in the reading. List of suggested words: (in order of the reading) to leave out as you read the passage the first time: hunting, spears, feast, earth bridge, continents, Asia, mammoth, New World, glaciers, Beringia. Read *A History of US: The First Americans*-"In The Beginning."

Step 3. Read *A History of US: The First Americans* -"In The Beginning" a second time; when you get to a “blank” the class will orally fill in the blanks with a word from the word bank. Take time, as needed, to discuss any incorrect words that students feel belong in blanks as a means of checking for comprehension.

Step 4. **FAST FORWARD** NOVA: "Mystery of The First Americans" to the visual of a rocky cliff and a campfire. Provide a **FOCUS FOR MEDICA INTERACTION** by asking students to identify what evidence made scientists and historians believe that most Native Americans came from Asia 12,000 years ago. The following clues will be helpful: what do we know about people from that time? What do we know about tools from that time? What do

we know about measuring the age of objects from the past? **RESUME PLAY. PAUSE** to check for comprehension after the narrator says, "the gospel of American archeology;" the visual is a painting of pre-historic hunters walking. Discuss the answers to the following questions: What evidence made scientists and historians believe that most Native Americans came from Asia 12,000 years ago? The following clues will be helpful, What do we know about people from that time? (Native Americans resembled people of Mongolia, China & Siberia) What do we know about tools from that time? (In the 1930s in Clovis, New Mexico spear points were discovered with mammoth bones) What do we know about measuring the age of objects from the past? (Radio Carbon dating in the 1950s showed the oldest site to be 11,400 years old which was the end of the last Ice Age.) Feel free to take a few minutes, as interest and time allows, to discuss the similarities between this information from the video, the information the students heard in the read-a-loud, and the information from the **Journeys of the First Americans** web site.

Step 5. Tell students they are going to find more information to help "Fill In The Blanks" about the mystery of the First Americans by learning more about what archeologist already know, and about what tools they use in their work and study. Using the accompanying web sites, students will work in their groups to answer the following questions as a **FOCUS FOR MEDICA INTERACTION:** Group 1: **"Meet Kennewick Man"** located at http://www.pbs.org/wgbh/nova/first/kennewick.html. 1) What is the person called that can read the map of a skull? (forensic scientists) 2) How do they read the skull? (Facial-reconstruction) 3) What are to reasons why these people read the skulls? (identify the recently dead, and to give a glimpse of our forebearers) 4) What two things are "integrated" or blended together to help scientist? (Science and Art) Group 2: **Close Encounters (of the Cosmic Kind)** located at http://www.pbs.org/wgbh/nova/first/radiocarbonce.html. 1) What is floating in our atmosphere right now?(nitrogen atoms) 2) What zips through the atmosphere, and occasionally collides with nitrogen atoms? (neutrons) 3) What does a nitrogen atom become when this collision occurs? (unstable and radioactive) 4) What does nitrogen turn into following this collision? (Carbon) 5) What eventually happens to all radioactive atoms?(decay or change in some way) Group 3: **Eating It (as in Yum) and Eating It (as in Bye-Bye)** located at http://www.pbs.org/wgbh/nova/first/radiocarbonei.html. 1) Every plant on earth contains a certain amount of what? (Carbon-14) 2) While a creature is living the percent of Carbon-14 is the same as the Carbon-14 found where? (in the atmosphere) 3) When does carbon stop entering a plant or animal's system? (when it dies) 4)

What will all Carbon-14 eventually turn back into? (nitrogen-14) 5) What do we need to know to figure out how long ago something lived? (The amount of Carbon-14 it had while alive and the rate at which it changed back in to nitrogen) Group 4: **(My So-Called) Half-Life** at http://www.pbs.org/wgbh/nova/first/radiocarbonhl.html. 1) What is needed to use a half-life measurement?(a group of objects or living things instead of just one) 2) Which kind of atom is the easiest to measure highly unstable atoms or less unstable atoms? (less stable) 3) What is the half-life of Carbon-14?(5,730 years) 4) What happens to the amount of Carbon-14 in an object as you measure back in time? (rises) Group 5: **Detection Section (What's Your Deflection?)** located at http://www.pbs.org/wgbh/nova/first/radiocarbonds.html. 1) What is one method used for determining the ration between Carbon-12 and Carbon-14 atoms with the species being dated? (particle accelerator) 2) The detector is situated in a position that only which atoms can reach it? (Carbon-14) 3) What does this process reveal? How much the Carbon-14 has decayed) 4) Carbon-14 dating is a relatively accurate dating measurement, what is the age of the item being measured? (40,000 years)

Step 6. Once groups have completed their research, check for comprehension by allowing them to share their findings. Spend time discussing what they found. Remind students that these tools of science are very important in helping scientists and historians "Fill In The Blanks" of the mystery of the First Americans. **REWIND** NOVA: "Mystery of The First Americans" to the visual of the credit at the beginning (about 4 minutes into the video.) Provide a **FOCUS FOR MEDIA INTERACTION** by asking students to be able to answer the following question: What was so different about the Kennewick Man skull? Why did it not fit what scientist thought they already knew? What did the skull not look like? **RESUME PLAY**. **PAUSE** for discussion on the visual of a scientist assembling the skull pieces; the audio is: "most important archeological find of the century." Discuss the answer to the question: What was so different about the Kennewick Man skull? Why did it not fit what scientist thought they already knew? What did the skull not look like? (It didn't look like the skulls of Native Americans)

Step 7. **FAST FORWARD** NOVA: "Mystery of The First Americans" to the visual of the New Mexico desert and the audio of the narrator "but it has also turned up another mystery skeleton" which is about 30 minutes into the video and give students a **FOCUS FOR MEDICA INTERACTION** by asking students to be able to answer the following questions: 1) How did scientist discover the age of "Spirit Caveman?" 2) In dating bones, how

accurate or how close to the actual age can scientist estimate? 3) How old was the Spirit Caveman?" 4) What tools did scientist use to recreate the skull of "Spirit Caveman?" **RESUME PLAY**. **PAUSE** to elicit student responses after the visual of the computer generated skull being lifted out of the liquid resin. Discuss the answers to the questions: 1) How did scientist discover the age of "Spirit Caveman?" (using Carbon-14 dating) 2) In dating bones, how accurate or how close to the actual age can scientist estimate?(60-70 years) 3) How old was the Spirit Caveman?" (9,000 years old) 4) What tools did scientist use to recreate the skull of "Spirit Caveman?" (computer, catscan, laser, liquid resin)

Step 8. **FAST FORWARD** to the visual of a woman viewing a skull and audio is: "in the hands of forensics sculpture Sharon Long…" give students a **FOCUS FOR MEDICA INTERACTION** by asking them to be able to identify 3 differences between "Spirit Caveman" and the Native American face and who the Kennewick Man resembles. **STOP** to check for comprehension after the audio "caused a great deal of confusion" and the visual of Patrick Stewart. Lead a discussion based on these questions: 1) What are 3 differences between "Spirit Caveman" and the Native American face? (1. Facial forwardness/Progmatheism, 2. Small chin (pointed chin) 3. small jaw 2) Who does Kennewick Man resemble? (Patrick Stewart from Star Trek/Caucasian) Remind students that we are always learning and continuing to learn more and more from archeological evidence about where and when people came to the Americas for the first time. We must always keep an open mind as to what we think we know and what we actually know.

CULMINATING ACTIVITY

Step 1. Ask students to name the various tools that scientists and historians used to study the mystery of the First Americans. Emphasize the importance of archeologists needing imagination, as well as creativity in the realm of the arts to accompany their scientific training when trying to recreate something that they have never seen before. Sometimes they must make an educated guess about what has existed in the past. That is where imagination and creativity come into play; they must “Fill In The Blanks” of historical and scientific mysteries.

Step 2. Provide each student with modeling clay and each group of students with a bag containing one unseen object. Students in each group should take turns putting their hands in the bag that contains their object without seeing with their eyes the actual object. They are to use their sense of touch to figure out what the object is and what it looks like. Students are to use the modeling clay to sculpt as best they can the object that they have "seen"

with their hands.

Step 3. Once students have completed sculpting their works, you may then reveal the actual objects to them and the class. Discuss the similarities and differences between their object and their sculptures.

CROSS-CURRICULAR EXTENSIONS

Language Arts
Students can visit the web site **JAMESTOWN REDISCOVERY: Ukrops Cereal Box** http://www.apva.org/cereal.htm. Give students a **FOCUS FOR MEDICA INTERACTION** by asking them to keep a journal of what has been discovered there that would support the claim that the original James Fort has been discovered.

Students can write a compare and contrast paper about the object that was in their bag and the sculpture they created.

Art
Students can work in media such as oil, or tempra, paints to complete the objects they created in the culminating activity. They will use their creativity and imagination to "guess" about color and details for their object.

COMMUNITY CONNECTIONS

Students can participate in a local archeological dig in their area. In the Nashville area, the Hermitage (http://www.thehermitage.com/arch2003.htm) has several opportunities for students of all ages to participate in digs.

Ask a member of a local archeological team, or dig, to come and speak to students about their experiences as an archeologist. (College students in local colleges who have spent time on sites as interns are an excellent source for this.)