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The following lessons were created by **Denise Payment**, a teacher participating in a National Endowment for the Humanities Summer Institute for Teachers entitled Touch the Past: Archaeology of the Upper Mississippi River Region.

Comparing and Contrasting Copper Mining by Evaluating Artifacts

Grade level: 7th and 8th

Subject: Life and Earth Science

Objectives:

Students will compare and contrast the development of copper mining of early pre-historic Native Americans to the late 19th century copper mining era at Isle Royale and the Keweenaw Peninsula.

Standards:

E.ES.07.41 Explain how human activities (surface mining, deforestation, overpopulation, construction and urban development, farming, dams, landfills, and restoring natural areas) change the surface of the Earth and affect the survival of organisms. (7th grade)

E1.1 Scientific Inquiry

Science is a way of understanding nature. Scientific research may begin by generating new scientific questions that can be answered through replicable scientific investigations that are logically developed and conducted systematically. Scientific conclusions and explanations result from careful analysis of empirical evidence and the use of logical reasoning. Some questions in science are addressed through indirect rather than direct observation, evaluating the consistency of new evidence with results predicted by models of natural processes. Results from investigations are communicated in reports that are scrutinized through a peer review process. (8th grade or HS)

E1.1A Generate new questions that can be investigated in the laboratory or field.

E1.1B Evaluate the uncertainties or validity of scientific conclusions using an understanding of sources of measurement error, the challenges of controlling variables, accuracy of data analysis, logic of argument, logic of experimental design, and/or the dependence on underlying assumptions.

E1.1C Conduct scientific investigations using appropriate tools and techniques (e.g., selecting an instrument that measures the desired quantity—length, volume, weight, time interval, temperature—with the appropriate level of precision).

Duration: Incorporated into different benchmarks over the course of a year.

Materials and Supplies:

Pictures or descriptions of archaeologically relevant pits from the Keweenaw Peninsula, Isle Royale National Park and Pictured Rocks National Lakeshore areas of the Upper Peninsula.

Pictures of topography in the Keweenaw and Alger County (if available) in as early a time as possible such as the 19th century or a written description

Topographic maps of the Keweenaw Peninsula, Isle Royale National Park and Alger County, specifically the Pictured Rocks National Lakeshore area.

Google Earth for current views of the areas in question.

Access to computers for research on Native cultures in Michigan

Library access for hard copy materials about Michigan

Presentation formats such as Prezi, PowerPoint, poster

PowerPoint on the Geology of Michigan by Denise Payment

Vocabulary:

Absolute dating

Archaic Period

Archaeology

Artifacts

Copper culture

Deforestation

Keweenaw Rift

Logging

Mining

Native copper

Paleo-Indian

Pits

Points (spear, arrow)

Relative dating

Urban

Woodland Indians

Background:

As different groups of people moved across the upper peninsula of Michigan they left behind evidence of their occupation. This evidence is seen in the artifacts that were left behind in the form of tools and structures that were necessary to living. When artifacts are found they can be classified based on structure and form and then compared to other similar artifacts for a relative or absolute date.

Pits are one way that early cultures left behind evidence. They could be as simple as cooking pits or garbage pits or mining pits. Depending on the culture, artifacts in the form of flakes from flint knapping, spears and pottery, hammer stones or organic refuse could be found.

Archaeologists have been able to classify many of the native cultures based on this evidence.

Other evidence might not be as obvious such as a change in the landscape based on the ways that each culture used the resources available to them.

Current cultures have also had an impact on the Upper Peninsula of Michigan directly related to the resources that could be exploited. Copper and other minerals, lumber, and fishing industries have also left their mark and through the use of archaeology we can learn about earlier cultures.

Tools that were useful in hunting and food gathering are used as evidence of how a culture obtained its food. The materials they used to make their spears and points are usually made of a specific type of rock such as chert/flint. Deposits of this rock type then become an important signature of where a people lived and who they might have traded with. As copper became available and knowledge of its properties was learned, tools made of copper made its way into various cultures. Eventually the copper was also used for adornment and these artifacts give valuable information. The use of copper progressed to the point that in the late 19th century it was a major commodity and had a great effect on the environment and culture of Michigan. Other evidence of early mining are the hammer stones found at sites that indicate the level of technology that was used to extract the copper.

Setting the Stage:

Archaeology will have to become an integrated part of my curriculum. Displaying examples of chert/flint and obsidian, and then examples of points and spear tips would be a way to activate interest in the subject when studying rocks and minerals. Students would be able to see physical evidence of how humans have used the resources of their environment to survive. Students will also be able to use rocks as tools and from them make inferences on how early Native Americans might have been able to accomplish tasks the same way.

I will be able to use examples of area archaeological sites to demonstrate to the students how the environment affects the development of a culture and how the environment is a way to obtain clues to that culture.

From a very early time in Michigan history copper mining has played a role in cultural development. In the past I have done a critical thinking project using a controversial topic such as mining to study the topic. I would like to expand upon the project by having students look at a timeline of copper mining in the Keweenaw Peninsula starting with an area paleo-indian culture through the major copper mining era in the 19th century.

It is my hope that there will be many little stages set so that students get a feel for the overall importance of archaeology to many areas of science and social studies.

Procedure:

There is no set procedure since I will introduce the topics in a variety of ways and in a variety of content areas as they appear in the curriculum.

Evaluation:

Most of the evaluation of archaeological knowledge will be integrated into formative and summative assessments of the material in which it is imbedded. (Example: spear and point formation during a study of rocks.)

Example question: What qualities does chert have that makes it a good rock type for

making a spear point? What kind of rock would make a good tool for hammering at a copper deposit?

What qualities does copper have that makes it useful as a tool but also difficult to mine?

The assessment for copper mining will be a group project. Students will gather information about three distinct time frames in Michigan history that reflect copper mining, starting with prehistoric copper culture through the 19th century. See attached lesson

Links:

<http://www.mpm.edu/collections/artifacts/anthropology/oldcopper/>

<http://ia600304.us.archive.org/13/items/oldcopperculture368quim/oldcopperculture368quim.pdf>
ancient copper culture

http://www.turtletrack.org/Issues02/Co11302002/CO_11302002_CopperCulture.htm

<http://voices.nmu.edu/content.asp?PageName=Anishinaabe> changes in lake levels

<http://www.mindat.org/article.php/255/Geology+of+the+Keweenaw+Peninsula,+Michigan>

Geology of the Keweenaw by Paul Brandes

<http://www.exploringthenorth.com/cophistory/cophist.html> Copper country information

http://www.minsocam.org/msa/collectors_corner/vft/mi5.htm Virtual Field Trip of the Keweenaw copper country.

<http://www.uwlax.edu/mvac/PointGuide/PointGuide.htm> Information on projectile points

<http://copperculture.homestead.com/> Information and other sources for information on ancient copper mining.

Extensions:

Chert/flint rock materials. Show examples of chert and arrow points to analyze how they could be used.

References:

James L. Theler and Robert F. Boszhardt, Twelve Millennia: Archaeology of the Upper Mississippi River Valley, University of Iowa Press, Iowa City (2003)

Copper Mining in the Upper Peninsula of Michigan

The purpose of this lesson is to look at the impact the copper mining has had on the culture of people who have inhabited the Upper Peninsula of Michigan.

Objectives:

In this lesson you will research the geologic processes that occurred to form the copper that is present in Michigan.

Using this information you will analyze how ancient cultures obtained the copper and determine how we have gotten the information about them from artifacts and environmental evidence left behind.

Using the same information on copper formation you will develop a timeline to show how the mining of copper progressed through the 19th century.

Analyze what artifacts have remained from this era that help explain this newer copper culture.

Materials:

Worksheet of questions

Powerpoint on geological processes that formed the Keweenaw Rift and native copper deposits from Mrs. Payment.

Slide show of pictures of copper pits around the Upper Peninsula of Michigan

1 meter of paper to form a timeline and markers.

Research materials either online or in hard copy.

Procedure:

Answer the following questions using research sites and materials provided by the teacher.

1. How did the copper form that we find in the Keweenaw and at Isle Royale National Park? Start with the Keweenaw Rift and end with copper being formed. 10 points
2. What evidence is there, particularly at Isle Royale, that copper was mined prehistorically? How can we prove this with data? Give at least three points of evidence. 9 points
3. Find at least three distinct time frames in Michigan history that provide artifacts and environmental evidence of copper mining. Design a timeline to demonstrate your

information. Complete the timeline on 1 meter length paper and label with as much information relevant to the era as possible. 25 points

4. During the latest time frame of copper mining what artifacts do you feel are important in explaining the culture that was present at the time of the mining? (Think about tools, buildings, other artifacts.) 6 points

Assessment:

Completed worksheet. Answers must be in complete sentences and meet the criteria listed with each question.

Completed timeline meeting the criteria in the question.

Total points 50.

List your references. You must have at least three. 10 points