

Tim Dowd
Hui Tang
EDSC 5543
10/11/06

Making the Natural Choice

Concept: Earth Materials can be used as resources.

Grade: 2

Earth Science in the Sam Noble Museum of Oklahoma Natural History

P.A.S.S.

Earth Science

Standard 3: Properties of changes of Earth and Sky - Earth materials consist of rocks, soils, water, and air. The sun appears to move across the sky in the same way every day. The student will engage in investigations that integrate the process standards and lead to the discovery of the following objectives:

1. **Earth Materials can be used as resources.**
2. The size and shape of shadows change at different times of the day (Oklahoma State Department of education, 2002).

The learning cycle is designed to meet this first objective, which is in bold It is also compatible with Content Standard D of the National Science Education Standards:

N.S.E.S.

Earth Science

As a result of their activities in grades K-4, all students should develop an understanding of:

- Properties of Earth Materials
- Objects in the Sky
- Changes in Earth and Sky (National Research Council, 1996)

This first objective is clarified in the same document to mean:

Properties of Earth Materials:

-Earth Materials are solid rocks and soils, water, and the gasses of the atmosphere. The varied materials have different physical and chemical properties, which make them useful in different ways, for example, as building materials, as sources of fuel, or for growing the plants we use as food. Earth materials provide many of the resources that humans use.

-Soils have properties of color and texture, capacity to retain water, and ability to support the growth of many kinds of plants, including those in our food supply.

-Fossils provide evidence about the plants and animals that lived long ago and the nature of the environment at that time (National Research Council, 1996).

This learning cycle is designed to teach the first bullet point in the above list (in bold;) Students will use displays in the Sam Noble Museum of Oklahoma Natural History to see how Native Americans created tools and other useful objects from objects that were available to them in the environment. Once the idea that different objects have different uses is developed, students will be given their own object and asked to describe what it is used for. Assessment will consist of the students writing a story about a person living on the plains, and asking them to describe the tools she uses and the clothes she wears, and how she got them out of the environment.

Standards Cited

Oklahoma State Department of Education. Priority Academic Student Skills. 8/22/02, accessed online at <http://sde.state.ok.us/home/defaultie.html> on 10/5/06

National Research Council. National Science Education Standards. 1996. Accessed online at <http://www.nap.edu/readingroom/books/nses/> on 10/5/06

Some of the terms for the different phases (i.e. “Getting the Idea”) come from the terms we were told Norman uses.

The idea for this learning cycle was based on a discussion given by the SNOMNS education coordinator on 9/21/06. One of the sets of classroom materials that the museum loans out was designed to have students understand the differences in materials from the environment (rawhide versus tanned hide, why some wood is good for bows, etc.) There is a display in the Discovery room that has different buffalo parts that may be interesting to students and was part of the inspiration for this learning cycle The SNOMNS kit is recommended for the concept application phase of this learning cycle and their inquiry materials might be an appropriate substitute for this phase.

Name: _____

Making the Natural Choice
Teacher's Guide

Exploring (Exploration)

The exploration is designed to take place at the Sam Noble Oklahoma Museum of Natural History in Norman, OK. The intended exhibit is the Hall of the Peoples Of Oklahoma. This learning cycle should work well at other museums that have exhibits showing how people lived off of the land in the past.

Materials:

This phase is done at the museum

Safety Info:

This activity does not appear to be dangerous

Procedures:

The museum requires 1 chaperone for every 5 kids at elementary school age (SNOMNH website)

The following is a script that one should read to the students when telling them they are going to be going on a museum trip. It should also be paraphrased when this worksheet is handed out to the students at the museum:

We are going to be going on a field trip to the Natural History Museum. There is an exhibit there which shows how the early Native Americans of Oklahoma once lived, and you will get to explore that exhibit. When you are looking around, write down some of the things you see in the space below. Pay careful attention to these objects. What are they made of? What are they used for?

In the space below, try to write down 5 objects that you see in the Hall. Also write what these objects were used for and what they were made of. An example is given below.

Object	What is it made of?	What does it look like?	What is it used for?
Canoe	A big, thick piece of wood	Hard, carved out, big	Traveling in the water
clothes	<i>This depends on what objects they notice</i>	<i>Soft, covering the body</i>	<i>Warmth, modesty, protection</i>
spear points "arrowheads "	Stone	<i>Hard, sharp, triangular</i>	<i>Cutting, piercing the skin of animals</i>
tools	<i>This depends on what tools they notice</i>	<i>This depends on what tools they notice</i>	<i>This depends on what tools they notice</i>
arbor	<i>Lightweight wood and leaves</i>	<i>Flat, broad</i>	<i>Keeping the rain out</i>

Sam Noble Oklahoma Museum of Natural History Fieldtrip Website. Accessed at http://www.snomnh.ou.edu/education/school_info/fieldtripinformation.htm on 10/5/06.

Name: _____

Making the Natural Choice
Teacher's Guide

Getting The Idea (Concept Development)

We will answer these as a group.

1.) What kind of objects did you see people using?

A canoe, clothes, arrowheads (spear points), tools for making the canoe, roof made of branches

This list is based on materials observed during a visit to the museum on 9/21/06 and from the exhibit's online description at <http://www.snomnh.ou.edu/exhibits/peopleok.shtml>, accessed 10/5/06

2.) Why are different objects made out of different things?

Ask them why a rock is a good material for a spear point? The expected response to this is "it can be sharp and hard"

Then ask them why a big log is good for a canoe? The expected response is that "it is big and wood can float."

Then ask why small branches and leaves are good for making a roof out of? The expected response is that they are light and can block the rain

3.) Are all materials just as good as each other for all purposes? Please explain why you think this!

*No. In the environment, there are many materials, each of which can be used by humans for a different purpose. This is the statement of the concept
There aren't any scientific terms to be introduced in this learning cycle. The term introduction deliberately uses vague questions in the written format, as most of the questions are meant to be said by the teacher at the museum setting, where chalkboards and overheads probably are not available. This is an example of an oral term introduction (Marek and Cavallo, 1997.) These authors say that the phase can either be done this way or using printed questions (pg 108.) An example of doing it this way is found on page 7 of the same book.*

Marek, EA and AML Cavallo The Learning Cycle: Elementary School Science and Beyond Heinemann, Portsmouth, NH 1997.

Name: _____

Making the Natural Choice *Teacher's Guide*

Using the Idea (Concept Application)

Materials:

Students will be working hands on with several objects. Some of these materials will come from the SNOMNH kit that is loaned out to elementary schools. This entire learning cycle was based on the materials contained in that kit, and the description of the activity that we were given by the museum staff. Their distinction between rawhide and tanned hide and the buffalo parts in their Discovery room prompted this lesson. The objects in their kit include tanned buffalo hide, raw hide, and other materials. The teacher should also obtain some dried grass, some very soft wood (like bamboo) and then some harder type of wood. S/He should also obtain some clay and some sort of very hard and sharp stone. Each group of 4 students will be given one object.

In the absence of the SNOMNH kit or any of the other materials described above, the teacher can put together some materials using commonly available objects from the environment or from local stores. The following materials were obtained for our in-class test.

- 1.) Dog chews (raw animal hide)*
- 2.) Leather-like materials from a fabric store (tanned animal hide)*
- 3.) Fake fur (available at fabric stores)*
- 4.) Yard waste (grass and small twigs)*
- 5.) A piece of wood*
- 6.) A small stone*

Safety:

No serious risks are anticipated in this phase of the learning cycle. Students should be instructed to be careful with sharp objects and to be gentle with materials belonging to the museum.

Procedure:

You have been given an object that comes from Oklahoma. Look carefully at this object and let everyone in the group touch it and move it around. If your object is sharp, please be careful with it. Some of these materials belong to the museum, and they've trusted us to take good care of them.

- 1.) Tell what your object looks like and feels like in the space below.

The expected response will differ for each object.

Try to come up with something that your object could be used for, and write this in the space below. Again, student responses will be different depending on the object. The teacher should then bring the students back together as a class and have each group present their object. Special attention should be paid to make sure the properties of the object match the use that the students see for it. Some of the above materials have been processed a bit from their natural forms. An example is the difference between leather and rawhide. This is a slightly different concept (that "natural materials have different properties depending on how we treat them,") but this is a good moment to teach it. Other examples the children might already know are the difference in dry grass and fresh grass, or "green" wood versus seasoned firewood.

Name: _____

Making the Natural Choice
Teacher's Guide

A Story (Assessment for this learning cycle)

This may need to be read to some students:

Imagine that you are a pioneer arriving in Oklahoma in 1890. You brought some of the things you need with you when you moved here, but you still need to make some things out of objects that you found in the environment. Tell a short story (no more than 5 sentences) about one object that you found to use in nature, and tell about how you used it. What about this object made it good for what you used it for? **This should be a different object than the one you came up with in your group.** Make sure you tell us what the object was, what you did with it, and what made it good for that job.

Anticipated responses are different depending on the object chosen. A complete one might be “I needed a house, and so I cut down some trees and cut them into wood to make them. Wood is strong and can keep the rain out of the house.”

Some of the reviewers of this learning cycle suggested that some more structure be provided. For this reason, the 5 sentence limit was put in, so that students would know that only a short response was necessary.

One reviewer commented that the learning cycle spanned a number of subjects, and we believe this is a strength of it. Students could be also learning about Native Americans or Oklahoma History in their social studies unit, or learning how to write small stories in their writing units. In this case the 5 sentence limitation could be removed and the activity could be used as an assessment for all of these components.

Based on our field experience, we realized that this would be too much for 3rd graders to process on their own, let alone 2nd graders. The instructions at least need to be read and paraphrased to the students

Assessment Rubric

The student has chosen an object from nature.	Yes (1 point)			No (0 points)
This is not the object that the student was given to use in his group previously.	Yes (1 point)			No (0 points)
The student makes it clear how his object can be used to serve a purpose.	The purpose is clearly identified, as is the property that allows the object to fulfill this purpose. This link is logical given the development of the students. (3 points)	The link is not clear, or either the purpose or the property of the material that makes it useful is not listed. (2 points)	Only one of the three required parts of the answer is present. (1 point)	The response is blank or has nothing to do with the question asked. (0 points)

Name: _____

Making the Natural Choice

Exploring

In the space below, try to write down 5 objects that you see in the Hall. Also write what these objects were used for and what they were made of. An example is given below.

Object	What is it made of?	What does it look like?	What is it used for?
Canoe	A big, thick piece of wood	Hard, carved out, big	Traveling in the water

Name: _____

Making the Natural Choice

Getting The Idea

We will answer these as a group.

2.) What kind of objects did you see people using?

3.) Why are different objects made out of different things?

4.) Are all materials just as good as each other for all purposes? Please explain why you think this!

Name: _____

Making the Natural Choice

Using the Idea

You have been given an object that comes from Oklahoma. Look carefully at this object and let everyone in the group touch it and move it around. If your object is sharp, please be careful with it. Some of these materials belong to the museum, and they've trusted us to take good care of them.

2.) Tell what your object looks like and feels like in the space below.

2.) Try to come up with something that your object could be used for, and write this in the space below.

Name: _____

Making the Natural Choice

A Story

Imagine that you are a pioneer arriving in Oklahoma in 1890. You brought some of the things you need with you when you moved here, but you still need to make some things out of objects that you found in the environment. Tell a short story (no more than 5 sentences) about one object that you found to use in nature, and tell about how you used it. What about this object made it good for what you used it for?

This should be a different object than the one you came up with in your group.

Here is a checklist for you to make sure you put what you should in your story:

- You chose something from nature
- It wasn't your group's object
- You tell why that thing was useful to you