



National Park Service  
U.S. Department of the Interior  
Pictured Rocks National Lakeshore  
[www.nps.gov/piro/forteachers.htm](http://www.nps.gov/piro/forteachers.htm)

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## “Time Capsules” Winter Sixth Grade Outdoor Activity

**Michigan Science Objectives:** At the end of this lesson, students will be able to:

1. Explain how the Pictured Rocks cliffs were formed. (Geosphere 10)
2. Explain one way humans are altering the environment which will be evident to future archeologists (decline of number of species). (Ecosystem 11)
3. Explain how behavior of organisms helps them to survive the changes brought on by a winter environment. (Evolution 2)
4. Explain likely changes to the Pictured Rocks area over time. (Ecosystem 9)

**Thinking Skills:** Theorize, predict and interpret.

**Overview of Activity:** Through a hands-on “treasure hunt” type of activity students will learn about different time period on the earth and the changes corresponding with each time period. Through a hands on investigation they will also learn about change in the winter environment. Note: The activity “Time Capsules” is from the Institute for Earth Education. Lesson plans and props may be purchased from them.

**National Park Connection:** National Parks preserve areas that tell the history of change in our natural and cultural resources and protect representations of different time periods we can learn from and enjoy.

### **Procedure:**

"We are going to work in two groups and do two different sets of activities. Each activity will take about an hour. Group A will stay inside for a minute to prepare for the hunt for the buried ‘time capsules.’ Group B will travel by snowshoe to an area to learn about Eskimo Snow. Does everyone have snow boots, hat and gloves?" Group B heads outside.

**Materials Needed:** brown stick of specks, treasure maps- laminated (5), wooden time capsules with ingredients (9), black box time capsules with ingredients (9), snowshoes, time room bookcase with posters (9), 2' x 1' x 1' wooden boxes (6), snow type scavenger hunt cards, laminated (16), grease pencils (6), dunes poster handouts.

### **Group A:** (one hour)

"Things are not always as they appear now as you will soon find out. In fact, this place right here has not always looked like it does now. It was very different in the past. Many people don't realize how everything is always changing, and that is an important concept. People in the future should know what the past was like."

“Hey what's that brown speck on your forehead?”

"Oh, that. That's a speck of soil that was part of the cereal I ate for breakfast. You see, the flow of energy and the cycling of materials (like this soil speck) are what change everything."

"Since I think you already know about the flow of energy and the cycling of matter, I would like you to use your knowledge to find out about past changes. A wizard made up nine time capsules (containers with objects and pictures showing what it was like in the past) and buried them near here. Here's a map he left for us."

"On this map there are X's indicating the locations of the buried time capsules. Each group of two or three gets to pick an X and head out to dig it up."

Head outside. Rest rooms. Don snowshoes and head for treasures!

### **Back Inside:**

Each group must now visit the "Time Room". Each group must first match up the objects and pictures in their capsules with one of the murals. When they find the mural that shows the past era represented by their capsule items, they should look for a small logo in a lower corner of the mural. Next they have to find that same logo on a "Time Shelf" in the bookcase. When they do, they discover how long ago things were like what the present mural shows. (The date in years before now is written on the back of the bookcase right behind their shelf - like 20,000 years ago.) The back is also painted to look like a soil profile, the wall of an excavation at the top and gradually changing to bedrock layers further down. Other items can be seen "buried" there.

When all groups have placed their objects on the shelves, present a summary of the time period stories. Beginning with the bottom shelf -- 3.5 billion years ago -- describe a time when there was no life at all; the whole world was water with volcanoes spewing out molten rock that cooled to form the first land surfaces. Most of this time period is buried under sediment accumulated over billions of years, but in the U.P. the glaciers exposed some of it as they scraped the land. In fact, Presque Isle in Marquette is a great place to see this ancient lava. Point out that one of the volcanic rocks on the shelf has a brown spot on it just like on my forehead.

"This soil speck can be traced on its journey through time as each shelf is described and the speck pointed out in a different object. It soon becomes apparent that the soil speck that began in volcanic rock 3.5 billion years ago is now a part of me! It's been recycled, used over and over through time, as parts of many different things."

"On the top of the bookcase is a model of the building we're in. The nine shelves below appear as layers underground."

Put another shelf over the top of the house model. "Someday people from the future might dig down and find things from today. I wonder what the future might be like up here? Will there be fewer plants and animals because we're changing things too fast today?"

"Most changes on earth take a very long time. But humans are changing things so fast, many plants and animals won't have a place to live in the future. Look out the bus window as you leave today. See all the new houses built along the shore. Without parks, very little shoreline will be left for wildlife up here. How about at your house or backyard? Humans seem to be against changes in nature in favor of their own. Do you stop natural changes by mowing your lawn or spraying herbicides on it? Your lawn is just trying to change into a field and then a forest, which would be a home again for a lot of other creatures."

"Some scientists think the dinosaurs may have disappeared because an asteroid struck the earth, creating a gigantic cloud of dust that blocked out the sun causing the plants the dinosaurs depended on to die. Will our pollution of the earth's atmosphere with carbon dioxide and deadly chemicals like PCB's and mercury cause similar problems for living things tomorrow? Think about it!"

### **Group B:**

"We're going to think like Eskimos and learn about the different names for snow and why they had them. We are first going on a snow scavenger hunt. Working in groups as we hike along to the frozen pond I would like you to try to find as many different types of snow as listed on your scavenger hunt card. Put a check mark by each kind you find. On the way back we will try to stop and look at different snow types, how they were formed and why it was important for Eskimos to know about them."

At the pond students find holes that have already been drilled through the ice. They will again work in groups to predict (1) temperature under the ice, and then (2) dissolved oxygen level under the ice. Next they will test for these and analyze how snow or ice could change life for species of the pond.

A sample is dredged up from the pond bottom for the students to look at. They are asked where the stuff came from and how this accumulation could change the pond in the future. Point out marsh grasses along edge of pond which borders forest. Ask if marsh grass area will ever change someday What do they think it will change into?

On the way back from the pond, student are asked to identify places where they located different types of snow or snow features.

### **Post-Trip Activity and Evaluation:**

"Today we have observed many different examples of change that have occurred in this area over time and are occurring right now before your eyes."

"At this time I would like you to complete the post-test. Please use examples that you have learned about today to answer the question."

DISCUSS changes that have shaped Pictured Rocks National Lakeshore and how pond and forest succession is still occurring along with erosion that will continue to change the area.

"CHANGE is a vital part of the natural world. Is it wise for us to try to stop the inevitable? Should we try to 'go with the flow' of change and plan for it or ignore it?"

"As responsible "resource keepers" we should all try to bring about positive changes in the environment and the way we live within that environment. That is we can do things to prevent unnecessary harmful changes to our natural resources and creatures that share them with us. A follow-up activity will explain this in more detail."

"As former President Clinton frequently discussed, we must not be afraid of change but embrace it and use it to help improve our world. Please help bring about good changes in our world. The future is in your hands! THANK YOU and GOODBYE!"