

Understanding Geological Time

Summary

Students will understand the timeline of the earth's geological features.

Materials

- One copy of the [student literacy readings](#) (pdf) for each student
- One title card for each time period, folded
- Rope long enough to stretch across your classroom
- Various art supplies for group artistic productions
- World map (optional)

For activity:

- Four different colored sheets of copy paper for each student
- Stapler
- Literacy reading about geological time for each student (in binder)
- Pencils
- Various coloring tools: crayons, colored pencils, thin markers, etc.

Media:

- *Bill Nye: Earth's Crust*
, Disney Educational Productions, 1995

Background for Teachers

Elementary students have difficulty understanding classifications of time beyond their own lifespan. Ten years, a hundred years, a million years--all are a long, long time to them. The Science Core requires that they "use a time line to identify the sequence and time required for building and breaking down of geological features on Earth" (Standard 2, objective 3, indicator c). This is difficult when some features change astonishingly quickly, like during an avalanche or earthquake, and other features take millions of years to change. This lesson focuses on the slow changes by introducing the students to the 4.5billionyear geological history of the earth. Learning the names of the periods and eras is not important, but by using them, students recognize that many features of the earth have changed extremely slowly! Important changes involving plants and animals are also mentioned; these help link student learning to prior and later years' science curricula and engage students who are more interested in biological events than geological ones. Note: The periods of the Earth's geological history have been subdivided into smaller categories than the ones presented here. Because knowing these names is not corerequired, this lesson presents only the general categories with occasional subcategory names.

Intended Learning Outcomes

- Use science processes and thinking skills.
- Manifest scientific attitudes and interests.
- Understand science concepts and principles.
- Communicate effectively using science language and reasoning.

Instructional Procedures

Invitation to Learn:

Pose the following question to students: "What do you know about the history of the earth? Not its people, but the earth itself?" Make a chart listing the students' knowledge, breaking it down into categories of plants, animals, and geology. Lead them to include major events like earthquakes and

tsunamis, and anything they know about the formation of the mountains and continents or the earth itself. Decide a way to color code their facts by underlining those that happened during their lifetime one color, during recorded human history another color, and by those that happened before recorded history a third color. (This activity could be done whole class or in small groups, with each group making a chart and presenting it to the entire class.)

Instructional Procedures:

After discussing the children's knowledge in the Invitation to Learn, take out a rope and string it across the room. Tell the students that we are going to learn what is believed about the history of the earth, most of which happened before humans existed on the planet. Have a folded card with the name of each major geological time period we are studying, and pass out the student literacy readings to the class. Ask students to choralread the information on each time period and place the folded title card over the rope at appropriate segments. As they read about each time period, ask for any background knowledge they have about that time period. (The time they probably know the most about is the Mesozoic Era, since that is the time period of the dinosaurs.) Particularly recognize that the time of humans is very, very recent, covering only the last tiny segment of the rope.

Divide the class into 6 or 7 groups, and give each group one classification of geological time. (You decide whether to subdivide the Cenezoic Era into the Paleogenic and the Neogenic Periods.) You may wish to find additional material on each of the classifications for them to research and study. Tell each group that they will have 15 minutes to create an artistic representation of their time period to present to the class. They may write a poem or song, create a dance, draw a picture, or make a simple play. Their presentation must depict the changes to the earth that occurred during their time period. While they are preparing, meet with each group to guide their activities.

During each group's presentation, have the other students keep the literacy readings available for reference. After each presentation, discuss the artistic representations of the changes to the earth. You may also wish to have a world map available for specific references to continental changes during the time periods.

Lesson and Activity Time Schedule:

The lesson time is 55 minutes, including teacher presentation and cooperative activities.

The foldable activity is 30 minutes.

Total lesson and activity time is 90 minutes.

Activity Connected to Lesson:

Students will make a layered foldable book with a page for each of the seven time periods taught in the lesson. Directions for making a layered foldable are available at <http://www.youtube.com/watch?v=4N0X3DkXNtM>. For this foldable, have students use four whole pages for their books, and have them make a threecolumn chart for each page. One column is for information about plant life, one column is for information about animal life, and one column is for information about geological events. Allow them to refer to the literacy pages to gather information from their pages, and assign them to illustrate each page and write the name of the geological time period on the tab part of the page at the bottom.

Extensions

The current time period could be expanded to include major earthquakes and volcanic eruptions that occurred during the period of human written history. Discuss what written history would have been like if it had occurred earlier. Students could write fictionalized accounts of major prehistoric geological or biological events. These events could also be dramatized.

Students could expand the concept of a timeline to include a timeline of their own lives, emphasizing geological events occurring in their own lifespan.

Family Connections:

Often families visit important geological sites for family vacations. Students could bring in pictures or souvenirs from these places to display and explain.

Specific geological sites could be chosen to feature on a laminated construction paper placemat designed by students. The placemat could feature a handdrawn picture of the site with captions and sidebars giving detailed information. A set of these placemats could be given to a student's family for a gift.

Assessment Plan

Evaluate the foldable book for completeness and accuracy.

Using their individual foldables as a reference, have students construct a timeline of only the events relating to the geological features of the earth that are presented in the student literacy.

They should include changes to continents and major mountain ranges.

Ask students to write a short descriptive essay describing the geological changes to the earth presented in this lesson in sequence without requiring specific period names or dates. Students may also be asked to write a compare/contrast essay after learning about geological events that occur quickly (landslide, avalanche, volcano, earthquake), comparing and contrasting changes that occur quickly with those that take millions of years to occur.

Authors

[Cathryn Ford](#)