

Tracing the Development of Life

Lesson Plan

Grade Level: 6-8

Curriculum Focus: Evolution

Lesson Duration: Two class periods

Student Objectives

- Research when a group of organisms first appeared on Earth.
- Create part of a classroom frieze documenting life on Earth.
- Give a brief report to the class.

Materials

- Video on *unitedstreaming: Elements of Biology: Biological Evolution*

Search for this video by using the video title (or a portion of it) as the keyword.

Selected clips that support this lesson plan:

1. From the Big Bang to Early Life
 2. The Evolution of Complex Organisms
 3. The Proliferation of Species
- Computer with Internet access
 - Library materials on the history of life on Earth
 - A long, narrow sheet of paper to create a wall frieze that extends around the entire classroom
 - Paper, pens
 - 5" x 7" index cards
 - Markers
 - Tape
 - Scissors
 - Paste

Procedures

1. Encourage students to share what they have learned about the history of Earth and the catastrophic forces – both extraterrestrial and terrestrial – that over the eons created the right conditions for life and sculpted the planet into the home we know today.
2. Tell students that they are going to create a time line of life on Earth.
3. Assign one of the following organisms or groups of organisms to each student, or have students work in pairs and make assignments to pairs. (Note: With permission, students may substitute an organism or group of organisms of their choice.)
 - bacteria
 - insects
 - plants
 - invertebrates
 - fish
 - amphibians
 - reptiles
 - birds
 - mammals
4. Encourage students to use library materials and the Internet to research their topic. The following Web sites have useful information.
 - History of Life on Earth
<http://seaborg.nmu.edu/earth/Life.html>
 - A Brief History of Life
<http://www.pbs.org/wgbh/nova/link/history.html>
 - Palaeos: The Trace of Life on Earth
<http://www.palaeos.com>
5. Tell students they must find out how long ago their organism first appeared on Earth. Instruct them to take notes and gather information containing at least 10 facts about their organism for a brief report to the class. These facts may include
 - the name of the geologic period in which the organism first appeared;
 - the organism's scientific name;
 - other life forms living during this period;
 - Earth's environment during this period; and
 - how the organism lived.

6. Distribute index cards to students. Have them use markers to write on their card the name of their organisms and the approximately how long ago they appeared on Earth (for example, “bacteria – 3.6 billion years ago,” or “birds – 200 million years ago”). Students should also include simple line drawings or use pictures from magazines to illustrate their life forms. (They may draw organisms such as bacteria as seen under a microscope.)
7. Use narrow paper to create a frieze that stretches around the classroom. Students will use the frieze to create their time line. Make sure they understand that the length of the time line reflects Earth’s estimated age of 4.6 billion years.
8. How to divide the time line for a classroom with four walls:
 - Use one wall to represent 4.6 to 3.6 billion years ago.
 - Use the second wall to represent 3.6 to 2 billion years ago.
 - Use the third wall to represent 2 to 1 billion years ago.
 - Use the fourth wall to represent the most recent billion years. Divide this wall into tenths, with each tenth representing one hundred million years.
9. Explain that the scale is not precise because the numbers delineating Earth’s history are so large, but it should give an idea of relative time periods.
10. Have students tape their index cards to the appropriate part of the time line. As they do this, have them give a brief report to the class about the life forms.

Assessment

Use the following three-point rubric to evaluate students’ work during this lesson.

- **3 points:** Students actively participated in class discussions; demonstrated an ability to conduct research diligently and thoroughly; created an index card with accurate information and images of an organism or group of organisms; placed the card correctly on the time line; gave an informative report to the class about the organism.
- **2 points:** Students participated somewhat in class discussions; demonstrated an ability to conduct on-grade research; created an index card with accurate information and images of an organism or group of organisms; placed the card correctly on the time line; gave a somewhat informative report to the class about the organism.
- **1 point:** Students participated little, if at all, in class discussions; had difficulty conducting research; created an index card with some accurate information and images of an organism or group of organisms; placed the card incorrectly on the time line; gave a less than informative report to the class about the organism.

Vocabulary

evolution

Definition: The process by which all forms of plant and animal life change slowly over time because of slight variations in the genes that one generation passes down to the next.

Context: Charles Darwin first put forward the theory of evolution

frieze

Definition: Any relief or painting used decoratively in a long horizontal format

Context: The students will make a decorative and informative frieze for the classroom

proliferation

Definition: Rapid reproduction, multiplication or growth in numbers

Context: Once begun, life proliferated rapidly

Academic Standards

National Academy of Sciences

The National Science Education Standards provide guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K-12. To view the standards, visit <http://books.nap.edu>.

This lesson plan addresses the following science standards:

- Earth and Space Science: Earth's history

Mid-continent Research for Education and Learning (McREL)

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit <http://www.mcrel.org/>.

This lesson plan addresses the following national standards:

- Science – Life Sciences: Understands relationships among organisms and their physical environment; Understands biological evolution and the diversity of life
- Language Arts – Viewing: Uses viewing skills and strategies to understand and interpret visual media; Reading: Uses reading skills and strategies to understand and interpret a variety of informational texts

Support Materials

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- <http://school.discovery.com/teachingtools/teachingtools.html>

