

Biology

Core Experiment

Standard ## 3520-06 Students will understand the process of evolution.	Topic: Evolution
Objective ## 3520-0601 Create a geologic time line correlated to the development of life on earth.	3520-01
ILOs: Use reference sources to obtain information. Construct models and simulations to describe and explain natural phenomena. Maintain a sense of curiosity about natural phenomena. Appreciate the challenges faced by scientists in the past, and respect the contributions these men and women have made to advancing science and technology.	

Description of Activity

Activity Title: Modeling the Geologic Time line and the Development of Life on Earth.

Activity Overview: Students working in teams will create a model of their own design that will depict the major times and events related to the evolution of life on earth.

Duration: 2-4 hours.

Background Information

The earliest traces of life suggest the presence of microorganisms about 3.5 billion years ago during what scientists call the Precambrian era. The first cells with nuclei appeared about 1.5 billion years ago. These evolved into simple forms of life that gave rise to more complex forms. Land plants, amphibians, and insects came into existence between 435 million and 225 million years ago during what scientists refer to as the Paleozoic era. Dinosaurs dominated the Mesozoic era, which began about 225 million years ago. The most recent era, titled the Cenozoic, began about 65 million years ago. It was not until the last several million years of this era that human beings appeared on earth.

Teaching and Learning Strategies

Students need to be familiar with the geologic ages of the Earth. Also, through library and handbook reference materials they need access to the information regarding traditional geologic times during which the critical evolutionary processes and diversity of life were taking place throughout the geologic history of the Earth.

Skill Building Activity

As a skill building activity, the teacher could help the students compare the geologic time scale to the years or days they personally have been on earth. Also, students could organize their own life into a time line.

Invitation to Learn (Inquiry)

Problem: To develop a graphic visual or activity which helps the mind better comprehend geologic time and the development of life on Earth.

Activity: Working in groups, the students will develop their own model of the Earth's geologic time line. They should have a variety of materials in hand to work with (e.g., tape, paper, rulers, meter sticks, calendars in various formats, rolls of adding machine paper, modeling clay, tape measures, beads and string, clock faces, etc.).

Materials, Facilities and Resources:

writing utensils
a broad selection of materials for construction
reference materials (may include time lines, calendars, etc.)
measuring devices

Summary of Learning

Assessment of learning strategies:

1. Teams may compare their geologic time line with other teams for peer assessment.
2. Teacher directed discussion questions:
 - A. How are years represented on your model?
 - B. How does your model help you visualize the rate of evolutionary change in different groups of organisms?
 - C. What group of organisms occupied most of the Earth's history?
 - D. What factors may have triggered the explosion of animal and plant diversity during the Paleozoic era?
 - E. How does the fossil record provide evidence for evolution?
 - F. When did humans first appear on earth?

Inquiry questions:

1. Which two cellular processes are considered to be the major driving forces leading to the explosive evolution and diversity of living organisms throughout the history of the Earth?

A.DNA replication.

B.Anaerobic respiration.

C.Aerobic respiration.

D.Mitosis.

E.Photosynthesis.

2.Using approximate geologic times and common names, summarize the major events occurring in organisms' evolution and diversity from the Cambrian period through the Quaternary period of the Earth's history.