

Evidence of Evolution

Strand Life Systems

Topic Investigating evolution evidence in the fossil record

Primary SOL LS.13 The student will investigate and understand that populations of organisms change over time. Key concepts include

- the relationships of mutation, adaptation, natural selection, and extinction;
- evidence of evolution of different species in the fossil record; and
- how environmental influences, as well as genetic variation, can lead to diversity of organisms.

Related SOL LS.10 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic, change over time, and respond to daily, seasonal, and long-term changes in their environment. Key concepts include

- phototropism, hibernation, and dormancy;
- factors that increase or decrease population size; and
- eutrophication, climate changes, and catastrophic disturbances.

Background Information

Review the concept of natural selection. Explain to students that if an organism does not have the adaptations that allow it to survive and reproduce, it cannot pass its genes to offspring and will therefore die out. Evidence for evolution can be found through the fossil record, radiometric dating, genetic information, the distribution of organisms, and anatomical and developmental similarities across species.

Fossils are the remains of living things that have transformed into stone over millions of years. The millions of fossils that scientists have collected and ordered are called the fossil record. The fossil record provides clues about when and how new groups of organisms evolved. It can also show which organisms have become extinct.

There are many resources on the Internet that provide information and illustrations related to the fossil record and evolution. Review these sites before sharing them with students.

Materials

- Examples of fossils
- Copies of a geologic timeline (may be found in a textbook or on the Internet)
- Colored pencils
- Drawing paper

Vocabulary

adaptation, evolution, extinction, fossil, mutation, natural selection

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Share with students a few fossils and their approximate ages. Explain how fossils are made naturally. Explain why fossils are important to scientists in determining a timeline of the history of organisms on the Earth.
2. Work with students in interpreting the geologic timeline. Discuss time periods and organisms found within that period.
3. Explain that other techniques such as radiometric dating, genetic information, and similarities of species help scientists understand how organisms have changed.
4. Using the fossils that were examined earlier, have students place them in order according to the geologic timeline. Have students construct and illustrate their own timeline of the fossils.

Assessment

- **Questions**
 - Why are fossils important to understanding changes in organisms over time?
 - What other methods are used to demonstrate evidence of evolution?
- **Journal/Writing Prompts**
 - Explain how natural selection contributes to the survival or extinction of an organism.
 - Describe the importance of fossils to our understanding of evolution.

Strategies for Differentiation

- Have students further investigate animals and their evolution. Vast information can be found on horses and whales, for instance. Consider having students construct timelines for these animals, as well.
- Have students construct a board game based on the geologic time scale.
- Using plaster and shells, help students understand how fossils are made in rock.