

3-LS4-1 Biological Evolution: Unity and Diversity

Students who demonstrate understanding can:

- 3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.** [Clarification Statement: Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms.] [Assessment Boundary: Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.]

The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices

Analyzing and Interpreting Data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- Analyze and interpret data to make sense of phenomena using logical reasoning.

Disciplinary Core Ideas

LS4.A: Evidence of Common Ancestry and Diversity

- Some kinds of plants and animals that once lived on Earth are no longer found anywhere. *(Note: moved from K-2)*
- Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments.

Crosscutting Concepts

Scale, Proportion, and Quantity

- Observable phenomena exist from very short to very long time periods.

Connections to Nature of Science

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- Science assumes consistent patterns in natural systems.

Observable features of the student performance by the end of the grade:

1	Organizing data
a	Students use graphical displays (e.g., table, chart, graph) to organize the given data, including data about: <ol style="list-style-type: none"> Fossils of animals (e.g., information on type, size, type of land on which it was found). Fossils of plants (e.g., information on type, size, type of land on which it was found). The relative ages of fossils (e.g., from a very long time ago). Existence of modern counterparts to the fossilized plants and animals and information on where they currently live.
2	Identifying relationships
a	Students identify and describe* relationships in the data, including: <ol style="list-style-type: none"> That fossils represent plants and animals that lived long ago. The relationships between the fossils of organisms and the environments in which they lived (e.g., marine organisms, like fish, must have lived in water environments). The relationships between types of fossils (e.g., those of marine animals) and the current environments where similar organisms are found. That some fossils represent organisms that lived long ago and have no modern counterparts. The relationships between fossils of organisms that lived long ago and their modern counterparts. The relationships between existing animals and the environments in which they currently live.
3	Interpreting data
a	Students describe* that: <ol style="list-style-type: none"> Fossils provide evidence of organisms that lived long ago but have become extinct (e.g., dinosaurs, mammoths, other organisms that have no clear modern counterpart). Features of fossils provide evidence of organisms that lived long ago and of what types of environments those organisms must have lived in (e.g., fossilized seashells indicate shelled organisms that lived in aquatic environments).

		<p>iii. By comparing data about where fossils are found and what those environments are like, fossilized plants and animals can be used to provide evidence that some environments look very different now than they did a long time ago (e.g., fossilized seashells found on land that is now dry suggest that the area in which those fossils were found used to be aquatic; tropical plant fossils found in Antarctica, where tropical plants cannot live today, suggests that the area used to be tropical).</p>
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