

Educational Resources from *Phenomenon Science Education*

Student Proficiency Goals for Performance Expectation **4-ESS1-1**



Information about Performance Expectation 4-ESS1-1

Performance Expectation 4-ESS1-1.

Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Clarification Statement.

Examples of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time; and, a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock.

Assessment Limits.

Assessment does not include specific knowledge of the mechanism of rock formation or memorization of specific rock formations and layers. Assessment is limited to relative time.

Science and Engineering Practice (Constructing Explanations and Designing Solutions)

- Identify the evidence that supports particular points in an explanation.

Disciplinary Core Idea (ESS1.C: The History of Planet Earth)

- Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed.

Crosscutting Concept (Patterns)

- Patterns can be used as evidence to support an explanation.

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SEP (Constructing Explanations and Designing Solutions):

- Students identify plausible explanations for geological phenomena that are related to changes in landscapes over time.
- Students describe discrete observations (e.g., characteristics or features in rocks and/or key fossils), as well as patterns of observations, that serve as evidence to support explanations for changes in landscapes over time.
- Students identify specific geological observations (e.g., characteristics or features in rocks and/or key fossils) within the described evidence that support relevant points in explanations for changes in landscapes over time.

DCI (ESS1.C The History of Planet Earth):

- Students know that Earth's landscapes change over time.
- Students know that there are Earth processes which cause landscapes to change over time.
- Students know that events and changes in a landscape can be identified by features in rocks and/or key fossils.
- Students know that in an undisturbed sequence of sedimentary material, the lower layers were formed before the upper layers.

CCC (Patterns):

- Students consider plausible explanations for patterns of observations (e.g., characteristics or features in rocks and/or key fossils) that form geological phenomena related to changes in landscapes over time.
- Students consider how observed patterns of observations (e.g., characteristics or features in rocks and/or key fossils) act as evidence to support explanations for changes in landscapes over time.