Grade 4

3.3.4.A Earth and Space Sciences: Earth's Place in the Universe

Students who demonstrate understanding can *identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.*

Clarifying 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 Boundary: 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 Practices (SEP)	Disciplinary Core Ideas (DCI)	Crosscutting Concepts (CCC)
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. • Identify the evidence that supports particular points in an explanation.	**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.	**Patterns** • Patterns can be used as evidence to support an explanation. ***Connections to Nature of Science*** **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** • Science assumes consistent patterns in natural systems.

Pennsylvania Context: Examples of Pennsylvania context include Pennsylvania rock cuts, caves, mine subsidence, and sinkholes.

PA Career Ready Skills: Distinguish among and set short-term, mid-range, and long-term goals.

Connections to Other Standards Content and Practices

Standard Source	Possible Connections to Other Standard(s) or Practice(s)
Agriculture (AFNR)	CS.02.01.01.a: Research and describe different types of geographic data used in AFNR systems.
Science, Environmental Literacy and Sustainability (NAAEE)	K-4 Strand 2.1.A. Earth's physical systems: Learners describe characteristics of Earth's physical systems, including air, water, and land. They explain how these systems interact with one another and identify changes in the physical environment over time. They provide examples of how physical systems affect living organisms, including humans.

Standard Source	Possible Connections to Other Standard(s) or Practice(s)
PA Core Standards: ELA	CC.1.4.4.V: Conduct short research projects that build knowledge through investigation of different aspects of a topic. CC.1.4.4.W: Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. CC.1.5.4.A: Engage effectively in a range of collaborative discussions on grade-level topics and texts, building on others' ideas and expressing their own clearly.
PA Core Standards and Practices: Math	MP.1: Make sense of problems and persevere in solving them. MP.2: Reason abstractly and quantitatively. CC.2.4.4.A.1: Solve problems involving measurement and conversions from a larger unit to a smaller unit. CC.2.4.4.A.4: Represent and interpret data involving fractions using information provided in a line plot.
PA Standards: Social Studies	7.2.4.A: Identify the physical characteristics of places and regions. 8.1.4.A: Identify and describe how geography and climate have influenced continuity and change over time.
Educational Technology (ISTE)	1.3. Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
Technology and Engineering (ITEEA)	STEL-4F: Describe the helpful and harmful effects of technology.