

Unit 8.2

Prior and Future Knowledge

Click below for prior and future knowledge for each NGSS dimension:

- [DCIs - Disciplinary Core Ideas](#)
- [SEPs - Science and Engineering Practices](#)
- [CCCs - Crosscutting Concepts](#)

DCIs	Prior Knowledge		Future Knowledge	
	3 - 5 Standards	Mi-STAR Sequence	Mi-STAR Sequence	9 - 12 Standards
LS4.A: Evidence of Common Ancestry and Diversity The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth.	Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (Note: moved from K-2) (3-LS4-1) Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1)	N/A	N/A	Genetic information, like the fossil record, provides evidence of evolution. DNA sequences vary among species, but there are many overlaps; in fact, the ongoing branching that produces multiple lines of descent can be inferred by comparing the DNA sequences of different organisms. Such information is also derivable from the similarities and differences in amino acid sequences and from anatomical and

				embryological evidence. (HS-LS4-1)
ESS1.C: The History of Planet Earth The geologic time scale interpreted from rock strata provides a way to organize Earth's history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale.	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. (4-ESS1-1)	N/A	N/A	Continental rocks, which can be older than 4 billion years, are generally much older than the rocks of the ocean floor, which are less than 200 million years old. (HS-ESS1-5) Although active geologic processes, such as plate tectonics and erosion, have destroyed or altered most of the very early rock record on Earth, other objects in the solar system, such as lunar rocks, asteroids, and meteorites, have changed little over billions of years. Studying these objects can provide information about Earth's formation and early history. (HS-ESS1-6)

SEPs	Prior Knowledge		Future Knowledge	
	3 - 5 Standards	Mi-STAR Sequence	Mi-STAR Sequence	9 - 12 Standards
Analyzing and Interpreting Data Analyze and interpret data to determine similarities and differences in findings. (MS-LS4-1)	Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings.	N/A	Unit 8.4	Compare and contrast various types of data sets (e.g., self-generated, archival) to examine consistency of measurements and observations. Evaluate the impact of new data on a working explanation and/or model of a proposed process or system.
Constructing Explanations and Designing Solutions Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to	Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem. Identify the evidence that supports particular points in an explanation.	Units 6.5, 6.7, 7.2A, 7.2B, 7.4	N/A	Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural

do so in the future. (MS-ESS1-4)				world operate today as they did in the past and will continue to do so in the future.
Developing and Using Models Develop and/or use a model to predict and/or describe phenomena. (supports unit's PE package)	Develop and/or use models to describe and/or predict phenomena.	Units 6.1, 6.2, 6.3, 6.7, 7.2A, 7.2B, 7.6	Units 8.3, 8.5A	Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

CCCs	Prior Knowledge		Future Knowledge	
	3 - 5 Standards	Mi-STAR Sequence	Mi-STAR Sequence	9 - 12 Standards
Patterns Graphs, charts, and images can be used to identify patterns in data. (MS-LS4-1)	Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena and designed products.	N/A	Units 8.3, 8.6	Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.
Patterns Patterns can be used to identify cause and effect relationships.	Patterns can be used as evidence to support an explanation.	Unit 6.6	Unit 8.5A	Classifications or explanations used at one scale may fail or need revision when

(supports unit's PE package)				information from smaller or larger scales is introduced; thus requiring improved investigations and experiments.
Scale, Proportion, and Quantity Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-ESS1-4)	Natural objects and/or observable phenomena exist from the very small to the immensely large or from very short to very long time periods.	Units 7.2A, 7.2B		The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs. Some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly. Patterns observable at one scale may not be observable or exist at other scales. Using the concept of orders of magnitude allows one to understand how a model at one scale relates to a model at another scale.