Mini-Map for SCI.EE.8.LS.EcoHlth-1

Subject: Science
Life Science (LS)
Grade band: 6–8

Grade-Level Expectation

DLM Essential Element	DLM Disciplinary Core Idea Family[1]	Framework Disciplinary Core Ideas
SCI.EE.8.LS.EcoHlth-1 Use data to explain the relationship between organisms' survival and growth and their interactions with both living and nonliving factors in their ecosystem.	Life Science – Ecosystem Health	LS2.A: Interdependent Relationships in Ecosystems LS2.C: Ecosystem Dynamics, Functioning, and Resilience LS4.D: Biodiversity and Humans ESS2.A: Earth Materials and Systems ESS2.D: Weather and Climate ESS2.E: Biogeology ESS3.A: Natural Resources

[1] DLM Science Essential Elements organize Disciplinary Core Ideas (defined in the *Framework for K-12 Science Education*) into DCI families. By combining similar concepts within a domain, science content from the general education standards is reduced in depth, breadth, and complexity to provide access for students that qualify for the DLM alternate assessment.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target[2]
Identify the steps or events that follow the completion of previous steps within the sequence of a familiar routine.	Use information to describe what living things (i.e., plants, animals, and people) get within their habitat (i.e., water, air, light, food, and a place to live) to stay alive.	Use information to describe the availability of living and nonliving resources (i.e., air, water, sunlight, food, and shelter) in different habitats.	Use data to explain how the living and nonliving elements of an ecosystem affect availability of resources and organisms' growth and survival.

[2] The target linkage level description is a measurement target that describes the expectations (content and performance) of the Essential Element for assessment purposes.

Essential Element Three Dimensions

Each Essential Element is defined in the three dimensions described in the *Framework for K-12 Science Education*: disciplinary core ideas (DCIs), science and engineering practices (SEPs), and crosscutting concepts (CCCs). The table below lists the details of each dimension from the individual DLM Essential Element descriptions, with color-coding of dimensions corresponding to the Next Generation Science Standards (NGSS). The first row (in blue) lists the SEP(s) used to construct the Essential Element and describes ways each SEP could be incorporated. The second row (in orange) describes the science concepts within the DCI family related to this Essential Element. The third row (in green) lists the CCC(s) associated with the Essential Element and explains how each might be incorporated in the grade band (quoted from NSTA, 2013, matrix of CCCs). Note that the SEP is presented first here (rather than second, as it is in the full list of Essential Elements) to reflect the emphasis on practices in instruction and across the linkage levels. The final row (in white) includes examples of how the three dimensions could work together to support instruction for the Essential Element. These examples provide ideas for integrating the dimensions and are not exhaustive, nor are they intended to limit instruction.

Science and Engineering Practices	**Analyzing and Interpreting Data:** Analyzing data in grades 6–8 builds on K–5 experiences and progresses to representing and evaluating data to support explanations about relationships and solutions to problems in the natural world. • Gather and represent data to determine and describe patterns. • Evaluate data to construct and support explanations. • Analyze data to evaluate solutions to problems. **Constructing Explanations and Designing Solutions:** Constructing explanations and designing solutions in grades 6–8 builds on K–5 experiences and progresses to constructing explanations about processes or relationships in the natural or designed world. • Use information, data, or models to construct descriptions and explanations of processes and relationships in the natural world.

Disciplinary Core Ideas	**Ecosystem Health** • Organisms, including humans, depend on their habitat (biosphere, hydrosphere, atmosphere, and geosphere) for many living and nonliving resources. These resources are not evenly distributed. • The survival of organisms is dependent upon their interactions with both other living things (biosphere) and nonliving factors (geosphere, hydrosphere, and atmosphere). o Interactions could include predation, competition, disease, immigration of species, migration of species, cooperation or symbiosis, drought, flood, food availability, and nesting and sheltering. • Limiting factors slow or stop population growth. Examples include predation, competition, disease, immigration of species, weather, food, and water availability. o Limiting factors affect populations' access to living and nonliving resources. • Ecosystems can change over time. • Living organisms (biosphere) have impacted Earth's spheres (hydrosphere, geosphere, and atmosphere). o Human activity can disrupt or improve ecosystems. o Focus is on the interactions or impacts and not on identifying or naming spheres.
Crosscutting Concepts	**Cause and Effect: Mechanism and Explanation**: Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering. • Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation. • Cause and effect relationships may be used to predict phenomena in natural or designed systems. • Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. **Systems and System Models**: A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems. • Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. • Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy, matter, and information flows within systems. • Models are limited in that they only represent certain aspects of the system under study.

	Stability and Change: For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand. • Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and forces at different scales, including the atomic scale. • Small changes in one part of a system might cause large changes in another part. • Stability might be disturbed either by sudden events or gradual changes that accumulate over time. • Systems in dynamic equilibrium are stable due to a balance of feedback mechanisms.
How three dimensions support instruction for this Essential Element	Students can use data to describe relationships among features of ecosystems and habitats as they change over time. They can understand that these changes can have causal effects on other aspects of the ecosystem. These changes can be small or gradual (e.g., a slow increase in annual rainfall or the slow decrease in the size of a population) or large or sudden (e.g., a large flood or the release of a new predator into a habitat). Students can learn about relationships within systems by evaluating how living and nonliving features of an ecosystem interact. Students can explain the cause-and-effect relationship between factors like resource availability and other parts of the ecosystem, like population size. Students can observe habitats that contain different amounts and kinds of resources and explain how the factors within an ecosystem affect and are affected by resource availability. Students can understand concepts of stability and change through their explanations of how changes to some parts of the ecosystem over time have important effects on other parts of the system. For example, in a drought, the types and numbers of plants and animals living in an ecosystem can change over time. Human activities, such as building structures within a habitat, can also result in a change in plant and animal populations.

Instructional Resources

Resources
Learning modules and additional science instructional resources can be found at https://www.dlmpd.com/science/
A glossary defining key science terms found in the Essential Elements can be found at DLM Glossary for Science Learning Maps.

Link to Text-Only Map

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