Mini-Map for SCI.EE.8.LS.Ecosys-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.Ecosys-1 Use a model to describe the transfer of food (i.e., matter and energy) between plants, animals, and decomposers.	Life Science – Ecosystem: Cycling of Matter and Flow of Energy	LS1.C: Organization for Matter and Energy Flow in Organisms LS2.A: Interdependent Relationships in Ecosystems LS2.B: Cycles of Matter and Energy Transfer in Ecosystems PS3.D: Energy in Chemical Processes and Everyday Life

[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 familiar places, events, people, and objects, including the functions of those familiar objects.	Use a food chain to identify either plants or other animals as a food source animals need to live.	Use a food chain/web to support the idea that animals eat different types of living things (i.e., only plants, only other animals, or both plants and other animals) to grow.	Use a model to describe the movement of different types of matter (i.e., different types of food sources) and energy between plants (i.e., producers), animals (i.e., consumers), and decomposers.

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

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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	**Developing and Using Models:** Modeling in grades 6–8 builds on K–5 experiences and progresses to developing and using models (e.g., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent relationships, events, and systems in the natural world. • Develop and use models to identify, describe, and compare components of a system. • Use models to explain and predict relationships between variables and components of a system.
Disciplinary Core Ideas	**Ecosystem: Cycling of Matter and Flow of Energy** • Energy (i.e., sunlight) is required for plants to produce food (i.e., plant matter). Therefore, the energy released from food was once energy from the Sun that was captured by plants in the process that forms plant matter (from air and water) (see SCI.EE.8.LS.Plant-1). • The food produced by plants is used for growth, used for energy, or stored for later use. • Some animals eat plants; some animals eat both plants and animals; some animals eat only animals. • Organisms are interconnected in food webs. Food webs model how matter and energy are transferred among producers, consumers, and decomposers. • Decomposers break down dead plants and animals, recycling nutrients to the soil.

Crosscutting Concepts	**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. **Energy and Matter: Flows, Cycles, and Conservation:** Tracking energy and matter flows into, out of, and within systems helps one understand their system's behavior. • Matter is conserved because atoms are conserved in physical and chemical processes. • Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. • Energy may take different forms (e.g., energy in fields, thermal energy, energy of motion). • The transfer of energy can be tracked as energy flows through a designed or natural system.
How three dimensions support instruction for this Essential Element	Students can use system models to learn about ecosystems and the transfer of energy and matter within the system. Students can use models to identify the components of an ecosystem (Sun, plants, animals, and decomposers). Within this system some animals eat plants, some animals eat animals, and some animals eat both. Students can notice how energy and matter flow within this system; for example, by recognizing that decomposers recycle nutrients back to the soil. Students can also track energy from the Sun to plants, plant energy to animals, and plant and animal energy eventually to decomposers. They can make the connection of energy transfer within the ecosystem when they use a model of a food web.

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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