Mini-Map for SCI.EE.5.LS.Plant-1

Subject: Science
Life Science (LS)
Grade band: 3–5

Grade-Level Expectation

DLM Essential Element	DLM Disciplinary Core Idea Family[1]	Framework Disciplinary Core Ideas
SCI.EE.5.LS.Plant-1 Use data to show that plants use energy (i.e., sunlight) and matter (i.e., air and water) for growth.	Life Science – Plants: Cycling of Matter and Flow of Energy	LS1.C: Organization for Matter and Energy Flow in Organisms 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]
Compare objects to determine whether they are the same or different.	Compare observations across multiple time points of the characteristics of objects, plants in the immediate environment, and the larger natural world to identify change over time.	Identify patterns within observations collected over multiple time points to relate the occurrence or lack of plant growth to what plants need to grow (i.e., water and light).	Use relationships in data between plant growth and available energy and matter in the environment to show that plants take in energy from light (i.e., sunlight) and matter from air and water to grow.

[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 3–5 builds on K–2 experiences and progresses to using and interpreting data to support claims and relationships. • Represent and interpret data in tables or graphs to determine and identify patterns that indicate relationships. • Use data as evidence for constructing and supporting claims about relationships. **Engaging in Argument from Evidence:** Engaging in argument from evidence in grades 3–5 builds on K–2 experiences and progresses to identifying information that can support claims about the natural world. • Identify relevant evidence to support a claim. • Use observations, information, data, or a model to support claims.
Disciplinary Core Ideas	**Plants: Cycling of Matter and Flow of Energy** • Plants acquire materials for growth mainly from the air and water and process matter and obtain energy from sunlight, which is used for body repair and growth. • Organisms get gases (air) and water from the environment. • Energy (stored) in plant matter is used for body repair and growth.

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. • Cause and effect relationships are routinely identified, tested, and used to explain change. • Events that occur together with regularity might or might not be a cause and effect relationship. **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 made of particles. • Matter flows and cycles can be tracked in terms of the weight of the substances before and after a process occurs. The total weight of the substances does not change. This is what is meant by conservation of matter. Matter is transported into, out of, and within systems. • Energy can be transferred in various ways and between objects.
How three dimensions support instruction for this Essential Element	Students can analyze data related to what causes plants to grow or not, such as the amounts of water, air, and light plants receive. Data to identify effects on growth might include the height, weight, condition, or number and size of leaves of plants in and away from sunlight, water, or air. For example, students could use data on the number of leaves on two identical plants, one exposed to sunlight and one in a dark location. Students can understand the concepts of energy and matter by using data to argue that plants get energy from sunlight and matter from air and water. Both are necessary for plants to grow. For example, students can use evidence of plant growth or lack of growth to note the transfer of energy from light (the Sun) to plants. Students can interpret plant weight (mass) data to note that when matter, in the form of water and air, is transported into the plant, the weight increases.

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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