Life Science Unit 1- Desired Results

ESTABLISHED GOALS:

MS-LS1-6: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. [Clarification Statement: Emphasis is on tracing movement of matter and flow of energy.]

MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

Transfer
Students will be able to independently use their learning to…
Support a scientific explanation or argument based on evidence
Observe and explore a given system or concept to deepen scientific understanding

Meaning

UNDERSTANDING:
Students will understand that…

Within a natural system, the transfer of energy drives the motion and/or cycling of matter. (MS-LS1-6)

Patterns can be used to identify cause and effect relationships. (MS-LS1-2)

Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-LS2-1

The transfer of energy can be tracked as energy flo[illegible] through

Meaning

ESSENTIAL QUESTIONS

How does a system of living and non-living things operate to meet the needs of the organism in an ecosystem?

Acquisition
Students will know…

Acquisition
Students will be skilled at…

Trimester 1: Ecosystems: Interactions, Energy, and Dynamics **Duration: 11 Weeks**

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MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. [Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interaction could include competitive, predatory, and mutually beneficial.] **MS-LS2-3:** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. [Clarification Statement: Emphasis is on describing the conversation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system.] **MS-LS2-4** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect population. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.	• Plants, algae (including phytoplankton),and many microorganisms use the energy from light to make sugars (food) from dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth for later use (MS-LS1-6) **Energy in Chemical Processes and Everyday Life:** • The chemical reaction by which plants produce complex food molecules (sugars) requires an energy an input (i.e., from sunlight) to occur. ○ In this reaction, carbon dioxide and water combine to form carbon-based organic water molecules and release oxygen (MS-LS1-6) **Interdependent Relationships in Ecosystems:** • Organisms, and populations of organisms, are dependent on their environmental interactions both with living things and with nonliving factors (MS-LS2-1) • In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other	• 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 do soin the future (MS-LS1-6) • Analyze and interpret data to provide evidence for phenomena (MS-LS2-1) • Construct an explanation that includes quantitative relationships between variables that predict phenomena. (MS-LS2-3) • Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation ora model for a phenomenon or a solution to a problem. (MS-LS2-4) • Evaluate competing design solutions based on jointly developed and agreed upon design criteria. (MS-LS2-5)

MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services. [Clarification Statement: Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and societal considerations.]	resources may compete with each other for limited resources, access to which consequently constraints their growth and reproduction. (MS-LS2-1) ● Growth of organisms and population increases are limited by access to resources. (MS-LS2-1) ● Predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (MS-LS2-2) **Cycle of matter and Energy Transfer in Ecosystems:** ● Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. (MS-LS2-3) ● Transfers of matter into and out of the physical environment occur at every level (MS-LS2-3)	

	• Decomposers recycle nutrients from dead plant or animal matter back into the soil in terrestrial environments or to the water in aquatic environments (MS-LS2-3) • The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3) **Ecosystem Dynamics, Functioning, and Resilience:** • Ecosystems are dynamic in nature; their characteristics can vary over time (MS-LS2-4) • Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4) • Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems (MS-LS2-5) • The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-5) **Biodiversity and Humans** • Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on---for example, water purification and recycling. (MS-LS2-5)	

	Developing Possible Solutions: ● There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-LS2-5)	

Stage 2 - Evidence

Evaluate Criteria	Assessment Evidence
	PERFORMANCE TASK(S):
	OTHER EVIDENCE: 6th Grade Introduction to Life Science Quarter 1 District Assessment: Ecosystems - Interactions, Energy, and Dymanics

Stage 3 - Learning Plan

Summary of Key Learning Events and Instruction