

Grade 7: Ecology

Stage 1 Desired Results

ESTABLISHED GOALS:	
<u>Competencies:</u> Patterns- Students will observe, predict, and analyze patterns in order to support evidence based claims about relationships (e.g., cause and effect, structure and function, macroscopic and microscopic). Cause and Effect- Students will investigate, explain, and evaluate potential causal relationships, using evidence to support claims and predictions about the mechanisms that drive those relationships Energy and Matter in Systems- Students will analyze evidence (e.g., investigations, models, theories, scenarios) to predict and track changes in the cycling of matter and flow of energy within and between systems in order to identify their possibilities and limitations. Stability and Change of Systems- Students will analyze and evaluate the stability of natural and human designed systems in order to develop evidence-based explanations and predictions of changes over time. Students will demonstrate the ability to analyze and summarize text and integrate knowledge to make meaning of discipline-specific materials. Students will demonstrate the ability to produce coherent and supported writing in order to communicate effectively for a range of discipline-specific tasks, purposes, and audiences. Students will demonstrate the ability to speak purposefully and effectively by strategically making decisions about content, language use, and discourse style. <u>Content Standards:</u> - 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. - 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. - MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple	Transfer
	Students will be able to independently use their learning to evaluate the health of an ecosystem.
	Meaning
	ENDURING UNDERSTANDINGS Students will understand that... - organisms have interdependent relationships in ecosystems. - matter cycles through ecosystems. - energy flows through ecosystems. - ecosystems are dynamic. - humans impact biodiversity and ecosystem stability. ESSENTIAL QUESTIONS - Is any one type of relationship between organisms more important than another? - How do limiting factors influence the carrying capacity of an ecosystem? - Why is it important for matter to cycle and energy to flow in ecosystems? - Will the environment be able to rebound from natural disturbances and/or human impact?
	Acquisition
	Students will know... - that predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. - that mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. - that although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments. - that biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. - that the completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. - that changes in biodiversity can influence humans' Students will be skilled at... - creating models to predict trends and explain patterns in data that support claims. - identifying patterns of interactions that provide information about natural systems. - investigating cause and effect relationships in order to explain the mechanism driving change. - predicting phenomena in natural systems. - developing a model and from it drawing evidence that matter is conserved in physical and chemical processes. - demonstrating how the transfer of energy drives the cycling of matter within a natural system.

ecosystems. ● MS-LS2-3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. ● MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. ● MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on. ● that organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. ● that in any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. ● that growth of organisms and population increases are limited by access to resources. ● that 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. ● that transfer of matter into and out of the physical environment occurs at every level.decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. ● that the atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. ● that ecosystems are dynamic in nature; their characteristics can vary over time. ● that disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. <u>vocabulary:</u> ecology, population, community, ecosystem, biome biosphere, niche, trophic level, interdependence, predation, competition, symbiosis, parasitism, mutualism, commensalism, abiotic factor, biotic factor, energy flow, energy pyramid, food chain, food web, biodiversity, ecosystem stability	● predicting possible changes within the system by tracking the transfer of energy flow through a natural system. ● using evidence to analyze and evaluate the stability and change of natural systems. ● examining changes over time to explain and predict the stability of a system. ● using evidence to predict how small changes in one part of a system may influence large changes in another part. ● using evidence to construct an argument of how stability might be disturbed either by sudden events or gradual changes that accumulate over time. ● demonstrating, using evidence, that a system in dynamic equilibrium is stable due to a balance of feedback mechanisms.
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Content Area Literacy Standards	21st Century Skills
● RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. ● RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. ● RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics. ● RST.6-8.8 Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. ● WHST.6-8.1 Write arguments focused on discipline-specific content. ● WHST.6-8.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. ● WHST.6-8.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. ● WHST.6-8.5 With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed. ● WHST.6-8.6 Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently. ● WHST.6-8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. ● WHST.6-8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. ● WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research.	● <i>reason effectively</i> ● <i>use systems thinking</i> ● <i>make judgments and decisions</i> ● <i>solve problems</i> ● <i>think creatively</i> ● <i>access and evaluate information</i>

Stage 2 - Evidence	
Evaluative Criteria	Assessment Evidence
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

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Stage 3 – Learning Plan <i>Summary of Key Learning Events and Instruction</i>	
<i>Language Arts Integration</i> 1.OA.1 Use	<i>Mathematics Integration</i> 1.OA.1 Use
<i>Technology Integration</i> 1.OA.1 Use	<i>District Materials</i>
<i>Science and Engineering Practices</i>	