

Grade 5: Matter and Energy in Ecosystems

Stage 1 Desired Results		
ESTABLISHED GOALS: <u>Competencies:</u> <u>Nature of Science and Engineering</u> - Students will demonstrate the ability to work collaboratively and individually to generate testable questions or define problems, plan and conduct investigations using a variety of research methods in various settings, analyze and interpret data, reason with evidence to construct explanations in light of existing theory and previous research, and effectively communicate the research processes and conclusions. <u>Systems and System Models</u> - Students will demonstrate the ability to investigate and analyze a natural or human designed system in terms of its boundaries, inputs, outputs, interactions, and behaviors and use this information to develop a system model that can be used to understand and empirically evaluate the accuracy of models in terms of representing the underlying system. <u>Energy and Matter in Systems</u> - Students will demonstrate the ability to analyze evidence from a variety of sources (investigations, models) to predict, connect and/or evaluate the cycling of matter and flow of energy within and between systems in order to understand, describe, or predict possibilities and limitations of systems. <u>Content Standards:</u> 5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water. 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Transfer	
	<i>Students will be able to independently use their learning to make informed ecological decisions based upon their knowledge of interdependent relationships in ecosystems.</i>	
	Meaning	
	ENDURING UNDERSTANDINGS <i>Students will understand that...</i> - a system can be described in terms of its components and their interactions. - matter is transported into, out of, and within systems. - energy can be transferred in various ways and between objects.	ESSENTIAL QUESTIONS Are the needs of humans more important than the needs of plants and animals?
	Acquisition	
	<i>Students will know...</i> - that the energy released from food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). - that an ecosystem is a community of organisms (including animals, plants, fungi, and bacteria) and the physical environment (air, water, soil) in which they live. - that organisms in an ecosystem are dependent on one another, as well as on the physical environment, for survival. - that food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. - that plants acquire their material for growth chiefly from air and water. - that the food of almost any kind of animal can be traced back to plants. - that organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. - that some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants	<i>Students will be skilled at...</i> - supporting an argument that plants get the materials they need for growth chiefly from air and water. - using a model to describe that energy in animals' food was once energy from the sun. - developing a model to explain the movement of matter among plants, animals, decomposers, and the environment.

	parts and animals) and therefore operate as “decomposers”. • that decomposition eventually restores (recycles) some materials back to the soil. • that organisms can survive only in environments in which their particular needs are met. • that a healthy ecosystem is reliant upon the interconnectedness between soil and water, and that the spread of pollution can damage the balance of an ecosystem. • that a healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web or life. • that newly introduced species can damage the balance of an ecosystem. • that matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. • that organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. <u>vocabulary:</u> ecosystem, organism, pollution, containment, algae, algal bloom	
Content Area Literacy Standards		21st Century Skills
not applicable		• use systems thinking • make judgments and decisions • reason effectively • collaborate with others

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

Stage 3 – Learning Plan

Summary of Key Learning Events and Instruction

Language Arts Integration

- RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
- W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
- SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

Technology Integration

Mathematics Integration

- MP.2 Reason abstractly and quantitatively.
- MP.4 Model with mathematics.
- MP.5 Use appropriate tools strategically.
- 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

District Materials