

Wright City Science Curriculum

Grade	8th Grade
Unit of Study	Ecosystems
Length of Unit	9 Weeks

Sample Essential Questions	Sample Corresponding Big Ideas
How does the survival of one population in an ecosystem depend on the physical (non-living) and biological (living) factors around it?	Interdependence and Balance: Ecosystems are complex systems where living (biotic) and non-living (abiotic) components are interconnected and rely on each other. A relative balance exists within a healthy ecosystem.
How can a single change in an ecosystem lead to multiple, cascading effects across different populations?	Ecosystem Change: Changes to either the physical (e.g., temperature, water availability, habitat) or biological (e.g., introduction of a new species, disease, loss of a food source) components of an ecosystem are constantly occurring
What happens to the balance of an ecosystem when a major change occurs, such as a flood, a drought, or the arrival of an invasive species? What kind of evidence is needed to prove that a specific change is the cause of a change in a population's size or health?	Population Response: These changes directly affect the size, health, and distribution of populations within the ecosystem. Some populations may thrive, while others may decline or even be eliminated.
How do humans change ecosystems, and what are the short-term and long-term effects of those changes on the living organisms? When a population size changes, how do we determine if the change is a natural part of the ecosystem's cycle or a sign of an unhealthy imbalance?	Cause and Effect: Every change in an ecosystem has a traceable effect on its populations. Scientists use evidence to establish a clear cause-and-effect relationship between the change and the resulting impact.
What are the main ways human activity can both harm and help the health of an ecosystem?	Human Impact and Stewardship: Human actions, both positive and negative, significantly influence ecosystems. Maintaining a healthy ecosystem requires intentional design, management, and stewardship.
When we create a plan to fix an ecosystem problem, how do we decide if the positive effects (benefits) are worth the negative effects (limitations)?	Trade-offs in Design Solutions: Any attempt to maintain or restore an ecosystem (a design solution) will have both positive consequences (benefits) and negative consequences (limitations or trade-offs), which must be carefully evaluated.
How do you use criteria (like cost, time, or effectiveness) to compare and choose the best plan for protecting an ecosystem?	Criteria for Evaluation: Design solutions should be judged based on specific criteria, such as effectiveness (does it work?), cost, feasibility (can it be done?), sustainability (will it last?), and ethical considerations.
What makes an ecosystem "sustainable," and how can a design solution help an ecosystem become more resilient and last longer? Why is it important to understand how all the parts of an ecosystem are connected when trying to design a solution for a specific problem?	Ecosystem Resilience and Sustainability: A successful design solution aims to increase the ecosystem's resilience (ability to recover from disturbance) and ensure its long-term sustainability (ability to remain healthy and productive).
If a solution seems to fix one part of the ecosystem, how can we check to make sure it won't cause a new problem in another part?	Systems Thinking: Evaluating design solutions requires understanding the ecosystem as a system, where a change in one component affects others, and solutions must address root causes, not just symptoms.

Missouri Learning Standards

Priority Standards

6-8.LS2.C.1: Construct an argument supported by empirical evidence that explains how changes to physical or biological components of an ecosystem affect populations.

6-8.LS2.C.2: Evaluate benefits and limitations of differing design solutions for maintaining an ecosystem.

Secondary Standards (Background Information)

6-8.LS2.A.2: Construct an explanation that predicts the patterns of interactions among and between the biotic and abiotic factors in a given ecosystem. [Clarification Statement: Relationships may include competition, predation, and symbiosis.]

6-8.LS2.B.1: 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 conservation of matter and flow of energy into and out of various ecosystems, including food chains and food webs.]

Unit 3 Sequence

MLS	Topic(s)	Learning Targets	Academic Vocabulary
6-8.LS2.C.1	Ecosystem Interactions	I will be able to describe the biotic and abiotic parts of an ecosystem in which organisms interact.	Ecosystem, Population, Biotic Factor, Abiotic Factor, Interdependence, Sustainability, Biodiversity, Organism, Competition, Dependence, Succession, Habitat, Invasive Species
		I will be able to explain how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors for survival	
6-8.LS2.C.2	Biodiversity	I will be able to describe how biodiversity contributes to the sustainability of an ecosystem.	

MLS	Learning Activities	
6-8.LS2.A.2	Energy in Ecosystem Notes	Must Do
6-8.LS2.A.2	Producers, Consumers & Decomposers Webquest Activity	Optional Level
6-8.LS2.B.1	Energy Pyramid Notes	Must Do
6-8.LS2.B.1	Food Chains and Food Webs Doodle Assignment	Can Do
6-8.LS2.B.1	Generation Genius: Food Webs Assignment	Can Do
6-8.LS2.A.2, 6-8.LS2.B.1	Energy & Matter through the Ecosystem Project	Must Do
6-8.LS2.C.1	Levels of Organization within an Ecosystem Notes	Must Do
6-8.LS2.C.1	Bill Nye: Populations Activity	Can Do
6-8.LS2.C.1	Ecological Relationships Notes	Must Do
6-8.LS2.C.1	Symbiotic Relationships Doodle Assignment	Can Do
6-8.LS2.C.1	Ecological Relationships Research Lab	Must Do
6-8.LS2.C.2	Biodiversity Notes	Must Do
6-8.LS2.C.2	Biodiversity Reading Comprehension Assignment	Can Do
6-8.LS2.C.2	Ecological Succession Notes	Must Do
6-8.LS2.C.2	Ecological Succession Comic Story Assignment	Optional Level

Assessments		
MLS	Description or Location	Rubric/Location
6-8.LS2.C.1, 6-8.LS2.C.2, 6-8.LS2.B.1, 6-8.LS2.A.2	Unit 3 Quiz 26/27	Pear Assessment

Additional Resources