



K I R K W O O D
S C H O O L D I S T R I C T

GREAT OUTDOORS 7-8

Course Description:

Great Outdoors students will read, examine and discuss human impact on the natural world. In addition to our classroom learning, students will have the opportunity to work with beehives, gardens, chickens, greenhouse, seed library, plant sale, vermicompost, birdhouse gourds, and pollinator hotels. Students considering this course should have a passion for the “Great Outdoors” and anticipate an academically and physically rigorous class.

Grade Level: 7th and 8th Grade

Unit Scope and Sequence

Unit 1: Native Plants and Native Pollinators

Unit 2: Biotic and Abiotic Factors

Unit 3: Biodiversity and Food Webs

Unit 4: Habitat Restoration

Course Enduring Understandings:

- Ecosystems are dynamic and interconnected systems shaped by the interactions between biotic and abiotic factors, which influence biodiversity, ecosystem function, and resilience.
- Biodiversity is fundamental to ecosystem health, stability, and essential for human well-being.
- Human activities, including habitat destruction, pollution, and climate change, pose significant threats to biodiversity and ecosystem integrity, underscoring the importance of conservation and restoration efforts.
- Understanding the relationships between native plants, pollinators, and other organisms within food webs is essential for promoting ecological sustainability, enhancing agricultural productivity, and mitigating the impacts of environmental change.
- Habitat restoration initiatives play a critical role in reversing ecosystem degradation and enhancing biodiversity to conserve natural habitats for future generations.

Course Essential Questions:

- Why are native pollinators crucial for maintaining biodiversity and ecosystem health, and how do their roles compare to those of non-native pollinators?
- How do interactions between biotic and abiotic factors influence the structure, function, and sustainability of ecosystems?
- How can we balance human development and environmental conservation to mitigate the negative impacts of human activities on ecosystems?
- How do changes in one part of a food web affect the stability and dynamics of the entire ecosystem?
- How can preserving biodiversity contribute to the sustainability and resilience of ecosystems in the face of environmental changes?
- How can habitat restoration strategies effectively reverse ecological damage and promote the recovery of native species and ecosystem functions?

GREAT OUTDOORS 7-8

UNIT 1: NATIVE PLANTS AND NATIVE POLLINATORS

Native Plants and Native Pollinators: This unit aims to educate middle school students about the vital relationship between native plants and native pollinators. Through interactive lessons and hands-on activities, students will learn about the importance of these relationships for local ecosystems, biodiversity, and agriculture.

Unit Essential Learning Targets	
<i>Enduring Understandings</i>	<i>Essential Questions</i>
<ul style="list-style-type: none"> ● Understand the role of native plants and pollinators in ecosystems. ● Recognize the impact of native pollinators on plant reproduction and biodiversity. ● Identify native plant and pollinator species in their local area. ● Develop strategies for supporting and conserving native plants and pollinators. 	<ul style="list-style-type: none"> ● Why are native plants and native pollinators crucial for maintaining healthy and sustainable ecosystems?
<i>Students must know:</i>	<i>Students must be able to:</i>
<ul style="list-style-type: none"> ● Native vs. non-native species ● Pollination processes ● Ecosystems ● Biodiversity and habitat conservation 	<ul style="list-style-type: none"> ● Define native plants and pollinators. ● Plan and plant a garden with native plants in the schoolyard or community. ● Discuss the characteristics of native species. ● Compare native species with non-native and invasive species. ● Explain the process of pollination. ● Discuss factors threatening native plants and pollinators (habitat loss, pesticides, climate change). ● Explore case studies of declining pollinator populations.

Missouri Learning Standards

Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity (7.LS2.C.1).

- Evaluate the impact of human activities on the environment and biodiversity

GREAT OUTDOORS 7-8

UNIT 1: NATIVE PLANTS AND NATIVE POLLINATORS

(7.LS2.C.1).

- Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations (7.LS4.D.1).
- Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment (8.ESS3.C.1).

GREAT OUTDOORS 7-8

UNIT 2 BIOTIC AND ABIOTIC FACTORS

Students will explain interactions between biotic and abiotic factors throughout this unit.

Unit Essential Learning Targets	
<i>Enduring Understandings</i>	<i>Essential Questions</i>
<ul style="list-style-type: none"> ● Acknowledge the intricate connections between biotic and abiotic factors, recognizing how they mutually influence ecosystem dynamics. ● Grasp how changes in biotic or abiotic elements trigger shifts in ecosystem structure and function, impacting population diversity and stability. ● Consider how competition for resources among organisms and the availability of abiotic necessities shape population dynamics and species distributions. ● Recognize how human activities alter both biotic and abiotic factors, causing disruptions in ecosystems and affecting biodiversity and ecological processes. ● Advocate for the sustainable management of ecosystems, understanding the interactions between biotic and abiotic factors to enhance resilience to environmental changes. 	<ul style="list-style-type: none"> ● How do biotic and abiotic factors interact to shape ecosystems? ● What are the consequences of changes in biotic and abiotic factors on ecosystem dynamics? ● How do organisms adapt to their biotic and abiotic environments? ● What role do competition and cooperation play in shaping biotic communities? ● How do human activities impact biotic and abiotic factors, and what can be done to mitigate these effects? ● What strategies can be employed to promote sustainability and resilience in ecosystems amidst changing biotic and abiotic conditions?
<i>Students must know:</i>	<i>Students must be able to:</i>
<ul style="list-style-type: none"> ● Ecosystem Components ● Biotic Interactions ● Abiotic Influences ● Adaptation and Evolution ● Population Dynamics ● Human Impact 	<ul style="list-style-type: none"> ● Recognize biotic and abiotic components of ecosystems and describe their roles and interactions. ● Evaluate interactions between biotic factors and between biotic and abiotic factors ● Assess adaptations of organisms to their environment, understanding how these adaptations contribute to survival and reproduction. ● Forecast population trends based on changes in biotic and abiotic factors, incorporating concepts like carrying capacity and population growth.

GREAT OUTDOORS 7-8

UNIT 2 BIOTIC AND ABIOTIC FACTORS

- Evaluate the impact of human activities on biotic and abiotic factors, identifying consequences and proposing mitigation strategies.
- Develop sustainable solutions for ecosystem management, considering the interplay between biotic and abiotic factors to enhance resilience and biodiversity.

Missouri Learning Standards

Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems (MS-LS2-2).

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

GREAT OUTDOORS 7-8

UNIT 3 BIODIVERSITY AND FOOD WEBS

During this unit, students will examine biodiversity and its effects on food webs.

Unit Essential Learning Targets	
<i>Enduring Understandings</i>	<i>Essential Questions</i>
<ul style="list-style-type: none"> ● Recognize that biodiversity plays a critical role in ecosystem health and stability. ● Understand how ecosystems function as interconnected systems. ● Analyze the structure and dynamics of food webs to discern relationships between organisms. ● Evaluate the impacts of human activities on biodiversity and food webs. ● Apply knowledge of biodiversity and food webs to advocate for conservation and sustainability practices. 	<ul style="list-style-type: none"> ● What is biodiversity, and why is it important? ● How do ecosystems function, and what role does biodiversity play in their stability? ● How are food webs structured, and what are the relationships between different organisms within them? ● What are the consequences of changes in biodiversity for food webs and ecosystem dynamics? ● How can we use knowledge of biodiversity and food webs to inform conservation efforts and sustainable practices?
<i>Students must know:</i>	<i>Students must be able to:</i>
<ul style="list-style-type: none"> ● Biodiversity ● Ecosystem ● Food web ● Habitat destruction ● Conservation ● Human impact 	<ul style="list-style-type: none"> ● Observe and describe organisms and their interactions within ecosystems. ● Analyze and evaluate complex ecological concepts and their implications for biodiversity. ● Interpret data related to population dynamics, species interactions, and ecosystem health. ● Conduct research on biodiversity hotspots, conservation efforts, and ecosystem restoration. ● Convey understanding of biodiversity and food webs through various mediums such as writing, speaking, and visual presentations.

**GREAT OUTDOORS 7-8
UNIT 3 BIODIVERSITY AND FOOD WEBS**

Missouri Learning Standards

Ecosystem Dynamics, Functioning, and Resilience - Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem (MS-LS2-C).

GREAT OUTDOORS 7-8

UNIT 4: HABITAT RESTORATION

During this unit, students will explore the importance of habitat restoration.

Unit Essential Learning Targets	
<i>Enduring Understandings</i>	<i>Essential Questions</i>
<ul style="list-style-type: none"> ● Habitat restoration is essential for preserving biodiversity, maintaining ecosystem services, and promoting the long-term health and resilience of natural environments. ● Human activities have profound impacts on habitats, often leading to habitat degradation, fragmentation, and loss. 	<ul style="list-style-type: none"> ● Why is habitat restoration important? ● What are the key principles and practices of habitat restoration? ● How do human activities affect habitats, and what are the consequences? ● What are the challenges and opportunities in habitat restoration?
<i>Students must know:</i>	<i>Students must be able to:</i>
<ul style="list-style-type: none"> ● Ecosystems ● Biodiversity ● Human impact: Global changes ● Habitat renewal 	<ul style="list-style-type: none"> ● Analyze ecosystems to understand their components, interactions, and ecological processes. They should recognize the importance of biodiversity in supporting ecosystem functions and providing ecosystem services. ● Evaluate the impacts of human activities on habitats and biodiversity. They should understand the various ways in which human actions alter ecosystems, leading to habitat degradation, fragmentation, and loss. ● Design habitat restoration plans based on ecological principles, site-specific conditions, and restoration goals. They should be able to select appropriate restoration techniques and identify native species for reintroduction.

Missouri Learning Standards

Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems (MS-LS2-2).