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Wonderful Wetlands 3rd -12th Standards Correlations

Indiana Academic Standards for Science (2016)

3rd Grade

Standard
3.LS.3 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

4th Grade

Standard
4.LS.1 Observe, analyze, and interpret how offspring are very much, but not exactly, like their parents or one another. Describe how these differences in physical characteristics among individuals in a population may be advantageous for survival and reproduction.
4.LS.2 Use evidence to support the explanation that a change in the environment may result in a plant or animal will survive and reproduce, move to a new location, or die.
4.LS.3 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction in different ecosystems.

5th Grade

Standard
5.LS.2 Observe and classify common Indiana organisms as producers, consumers, decomposers, or predator and prey based on their relationships and interactions with other organisms in their ecosystem.

6th Grade

Standard
6.LS.1 Investigate and describe how homeostasis is maintained as living things seek out their basic needs of food, water, shelter, space, and air.
6.LS.3 Describe specific relationships (predator/prey, consumer/producer, parasite/host) and symbiotic relationships between organisms. Construct an explanation that predicts why patterns of interactions develop between organisms in an ecosystem.
6.LS.4 Investigate and use data to explain how changes in biotic and abiotic components in a given habitat can be beneficial or detrimental to native plants and animals.
6.LS.5 Research invasive species and discuss their impact on ecosystems.

7th Grade

Standard
7.ESS.7 Describe the positive and negative environmental impacts of obtaining and utilizing various renewable and nonrenewable energy resources in Indiana. Determine which energy resources are the most beneficial and efficient.

8th Grade

Standard
8.ESS.3 Research how human consumption of finite natural resources (i.e. coal, oil, natural gas, and clean water) and human activities have had an impact on the environment (i.e. causes of air, water, soil, light, and noise pollution).
8.LS.5 Explain how factors affecting natural selection (competition, genetic variations, environmental changes, and overproduction) increase or decrease a species' ability to survive and reproduce.
8.LS.9 Examine traits of individuals within a species that may give them an advantage or disadvantage to survive and reproduce in stable or changing environment.

9th-10th Biology

Standard
B.3.2. Design, evaluate, and refine a model which shows how human activities and natural phenomena can change the flow of matter and energy in an ecosystem and how those changes impact the environment and biodiversity of populations in ecosystems of different scales, as well as how these human impacts can be reduced.
B.3.3 Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, and identify the impact of changing conditions or introducing non-native species into that ecosystem.
B. 5.5 Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment

11th-12th Environmental Science

Standard
Env.1.1 Understand and explain that ecosystems have cyclic fluctuations, such as seasonal changes or changes in population, as a result of migration, birth, and mortality.
Env.1.2 Understand and explain that human beings are part of Earth's ecosystems and give examples of how human activities can, deliberately or inadvertently, alter ecosystems.
Env.1.5 Identify and measure biological, chemical, and physical (abiotic and biotic) factors within an ecosystem.
Env.2.3 Recognize and explain that the amount of life any environment can support is limited by the available energy, water, oxygen, nutrients and minerals, and by the ability of ecosystems to recycle organic materials from the remains of dead organisms.
Env.2.7 Differentiate between renewable and nonrenewable resources, and compare and contrast the pros and cons of using nonrenewable resources.
Env.4.1 Explain environmental policies/organizations (Clean Water Act, Clean Air Act, Endangered Species Act, Species Survival Plan, Resource Conservation and Recovery Act, Department of Energy, and the World Health Organization) and identify their impact.
Env.4.2 Understand that environmental policies/decisions have negative and positive impacts on people, societies, and the environment.
Env.5.5 Identify the indirect and direct threats to biodiversity (e.g. habitat loss and destruction, invasion by exotic species, commercial over fishing and hunting, pollution, climate change, and bioaccumulation and biomagnification of toxins).
Env.5.6 Identify and explain the three levels of biodiversity: genetic, species, and ecosystem
Env.6.4 Explain how the carrying capacity of an ecosystem may change as availability of resources changes
Env.7.3 Compare and contrast the effects of environmental stressors (i.e. herbicides, pesticides) on plants and animals. Give examples of secondary effects on other environmental components.
Env.8.6 Understand and describe the concept and the importance of natural and human recycling in conserving our natural resources.
Env.8.7 Understand and explain that waste management includes considerations of quantity, safety, degradability, and cost. Also understand that waste management requires social and technological innovations because waste-disposal problems are political and economic as well as technical.

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Indiana Environmental Literacy Guidelines for up to Grade 8

Questioning, Analysis, and Interpretation	Knowledge of Environment Processes and Systems	Skills for Understanding and Addressing Environmental Issues	Personal and Community Action
Identify specific environmental questions, problems, or situations related to local, national and global environmental issues.	Describe major ecosystems of Indiana.	Describe and explain specific environmental issues, including the history and origins of an issue, actions that have been taken to address the issue, the effects of these actions, and the current situation.	Expand their personal connections with their local environment.
Design focused environmental investigations using appropriate measurements, observations and tools.	Explain how humans' use of our resources can impact the environment and deplete resources.	Identify different forms of action that citizens can take: actions in the economic, political, and legal spheres; actions designed to directly improve or maintain the environment; or actions that persuade others to take action.	Develop a sense of place and understand their unique position in the global environment.
Classify, organize, and display data and information in ways that help others be able to understand, analyze and interpret the data.	Explain the difference between point and nonpoint source pollution.		Create and put into action a personal plan for themselves and their families for effective environmental stewardship.

Indiana Environmental Literacy Guidelines for up to Grade 12

Questioning, Analysis, and Interpretation	Knowledge of Environment Processes and Systems	Skills for Understanding and Addressing Environmental Issues	Personal and Community Action
Develop, modify, clarify, and explain questions about important environmental issues, and describe why and how they arrived at those questions.	Predict how changes in the environment will impact populations.	Define and clearly articulate environmental issues, taking into consideration connections to other issues, how widespread its effects are, and whether it is unique to a particular area.	Articulate their personal beliefs regarding their relationship to the environment and how they arrived there by citing personal experiences, alternative viewpoints, and the research of scientifically-relevant sources.
Use appropriate problem solving methods, tools, and technology to do the investigations.	Assess how changes in the availability and use of natural resources (especially water and energy sources) will affect society and human activities such as transportation, agricultural systems, and manufacturing.	Design and conduct a field investigation to gather information and data on an environmental issue in order to guide decisions on action steps.	
Organize and display data and information using a variety of technology and media, always paying attention to accuracy and scale.	Analyze the factors that determine carrying capacity (the number of organisms that can exist in a given area).	Compare the effects of natural and human-caused activities that contribute to or challenge an ecologically and economically sustainable environment.	

Program Synopsis

In Wonderful Wetlands, students will use critical thinking skills correlated to Bloom's Taxonomy. Students will create, evaluate, analyze, apply, understand, and remember knowledge by participating in hike activities, dipping in the wetland for macroinvertebrates, participating in labs, and playing games related to macroinvertebrates.