

Merry Lea Environmental Learning Center of Goshen College

Standards Correlations Biodiversity 6th - 12th

Program Synopsis

Students discover the diversity of life at Merry Lea firsthand by exploring multiple ecosystems on our trails. In each habitat, students identify native organisms and discuss the interconnections of mammals, insects, plants, humans and more. Assess the importance of biodiversity by flipping logs, interpreting abiotic features, and meeting the flora and fauna of Merry Lea.

Indiana Academic Standards for Science

6th Grade

- 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

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

- **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.

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9th - 12th Grade Biology

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

B.5.5

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.

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.

9th - 12th Grade Environmental Science

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.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.

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Indiana Environmental Literacy Guidelines

for up to 12th Grade

Questioning, Analysis and Interpretation

Develop, modify, clarify, and explain questions about important environmental issues. and describe why and how they arrived at those questions.

Use evidence and logic in developing the explanations about students' original hypotheses: use statistics and be able to distinguish between cause and effect.

Knowledge of Environmental Process and Systems

Describe the value of ecosystems from both Evaluate the importance of biodiversity. natural and human perspectives; e.g. food, shelter, flood control, water purification, etc.

Skills for Understanding and Addressing Environmental Issues

Evaluate whether action is warranted in specific situations, taking into consideration the following factors: existing information about the issue and proposed solutions; uncertainty around an issue; scale of the issue; social, economic and ecological consequences; environmental laws and rules; risks involved and alternatives to citizen action.

Ask questions, offer alternative explanations and defend interpretations of environmental issues.

Personal and Community Action

Write a comprehensive and feasible plan of action based on personal goals of stewardship for an economically and ecologically sustainable environment, and take informed and effective action that will contribute to the resolution of somewhat complex and controversial local and global environmental issues.

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.

Document prepared by Merry Lea according to current Indiana Academic Standards from the Indiana Department of Education website and according to Indiana Environmental Literacy Guidelines from the Environmental Education Association of Indiana.