Microhabitats

Biodiversity Box

This sheet has been provided to give educators an idea of what each Biodiversity Box encompasses and which curriculum standards are met through these resources. The Biodiversity Box is intended for use in the classroom of middle school students and was designed with you, the teacher, in mind. For any additional questions, please contact Todd Witcher at todd@dlia.org, or through phone at 865-430-4757.

Biodiversity Box provides all materials needed to conduct student activities. Teacher curriculum guide is provided in the box to help guide the teacher with why activity develops students, materials needed, how to properly conduct activity, and follow up questions. To order a Biodiversity Box, please visit the teacher's resources section under education at www.dlia.org to fill out a request form.

By surveying microhabitat variables on their school grounds, students develop an understanding of what a microhabitat is. Other activities introduce them to some important but unfamiliar microhabitats common to the Great Smoky Mountain National Park including fallen logs and leaf litter. Two potential data-sharing projects are presented – one involving leaf litter critters and the other on gall makers.

Activities

Surveying Microhabitat Variables	Students survey a study plot in the schoolyard, using materials and methods of scientists to collect data on habitats. Census of plant species, soil temperature, and sunlight levels help students determine whether plant species prefer different microhabitats Tennessee (6.2.2 6.2.3 6.2.4 8.5.3 8.5.4) North Carolina (6.L.2.1 6.L.2.2 6.L.2.3
Come to Order	Students study model of invertebrates, note their characteristics, learn their scientific names, and identify them down to the level of orders Tennessee (6.2.2 6.2.3 8.5.3 8.5.4) North Carolina (8.P.2.1 8.P.2.2)
The Rotten Log	Students use book *Life in a Rotten Log* to study organisms thriving in simple spaces such as a rotten log Tennessee (6.2.1 6.2.3 6.2.4 8.5.4) North Carolina (6.L.2.3 8.L.3.1 8.L.3.2 8.L.3.3)
Galls Puppet Show	Students are introduced to galls, which are abnormal growth of plant tissue. Through this puppet show, students learn what galls are, how to identify them, and why they are important Tennessee (6.2.3 8.5.1) North Carolina (6.L.2.3 8.L.3.2)
On the Trail of the Wild Pill Bug	Students learn use of simple traps to sample invertebrates. Students learn diversity and distribution of invertebrates in different microhabitats, and create traps to catch pill bugs Tennessee (6.2.1 6.2.2 6.2.3 8.5.3 8.5.4) North Carolina (6.L.2 8.L.3)
Turning Over an Old Leaf	This "reader's theater" narrative discusses how scientists discover diversity in the most unlikely places Tennessee (8.5.3 8.5.4 8.5.5) North Carolina (8.P.2.1 8.P.2.2 8.L.3.2 8.L.3.3)

Materials

Teacher's Guide	Rubber Bugs (12)	Bug Sorting Mats (8)
Bug Answer Keys (8)	Bug Pronunciation Key (30)	Light/Moisture Meters (6)
Soil Thermometers (7)	Soil Test Kits (7)	Stick Puppets and Script (5)
Gall on Oak Leaf (1)	*Life in a Rotten Log (12)*	Hands-On Nature (1)

Tennessee Science Curriculum Standards

Sixth Grade:

-Embedded Inquiry

- 6.Inq.1 Design and conduct open-ended scientific investigations
- 6.Inq.2 Use tools and techniques to gather, organize, analyze, and interpret data
- 6.Inq.3 Synthesize information to determine cause and effect relationships between evidence and explanations
- 6.Inq.4 Recognize possible sources of bias and error, alternative explanations, and questions for further exploration
- 6.Inq.5 Communicate scientific understanding using descriptions, explanations, and models

-Interactions Between Living Things and Their Environment:

Recognize relationships within food chains

- 6.2.1 Classify organisms as producers, consumers, and decomposers
- 6.2.2 Demonstrate interrelationships among organisms in food web

-Diversity and Adaptation Among Living Things

-Understand how organisms are adapted for surviving in particular environments

- 6.2.3 Draw conclusions from data about interactions between the biotic and abiotic elements of a particular environment.
- 6.2.4 Analyze the environments and the interdependence among organisms found in the world's major biomes

Eight Grade:

-Embedded Inquiry

- 8.Inq.1 Design and conduct open-ended scientific investigations
- 8.Inq.2 Use tools and techniques to gather, organize, analyze, and interpret data
- 8.Inq.3 Synthesize information to determine cause and effect relationships between evidence and explanations
- 8.Inq.4 Recognize possible sources of bias and error, alternative explanations, and questions for further exploration
- 8.Inq.5 Communicate scientific understanding using descriptions, explanations, and models

-Diversity and adaptation among living things

- 8.5.1 Identify various criteria used to classify organisms into groups

-Interactions between living things and their environment

- 8.5.3 Analyze how structural, behavioral, and physiological adaptations within a population enable it to survive in a given environment
- 8.5.4 Explain why variation within a population can enhance chances for group survival

-Earth Resources

-Investigate how human activities affect Earth's land, oceans, and atmosphere

- 8.5.5 Describe importance of maintaining the Earth's biodiversity

North Carolina Essential Standards

Sixth Grade:

-Ecosystem

6.L.2 Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.

6.L.2.1 Summarize how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within food chains and food webs (terrestrial and aquatic) from producers to consumers to decomposers.

6.L.2.2 Explain how plants respond to external stimuli (including dormancy and forms of tropism) to enhance survival in an environment.

6.L.2.3 Summarize how the abiotic factors (such as temperature, water, sunlight, and soil quality) of biomes (freshwater, marine, forest, grasslands, desert, Tundra) affect the ability of organisms to grow, survive and/or create their own food through photosynthesis.

Eight Grade:

-Energy: Conservation and Transfer

8.P.2 Explain the environmental implications associated with the various methods of obtaining, managing, and using energy resources.

8.P.2.1 Explain the environmental consequences of the various methods of obtaining, transforming and distributing energy.

8.P.2.2 Explain the implications of the depletion of renewable and nonrenewable energy resources and the importance of conservation.

-Ecosystems

8.L.3 Understand how organisms interact with and respond to the biotic and abiotic components of their environment.

8.L.3.1 Explain how factors such as food, water, shelter and space affect populations in an ecosystem.

8.L.3.2 Summarize the relationships among producers, consumers, and decomposers including the consequences of such interactions including: coexistence, competition, parasitism, and mutualism

8.L.3.3 Explain how the flow of energy within food webs is interconnected with the cycling of matter (including water, nitrogen, carbon dioxide and oxygen).