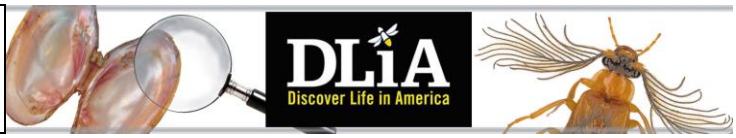
An Introduction to Biodiversity

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.

Activities

Welcome to an ATBI	A PowerPoint presentation is used to give students an overview of what an ATBI is and how it is conducted in the Great Smoky Mountain National Park Tennessee (6.2.4 8.5.1 8.5.2) North Carolina (6.L.2.3 8.P.2.2 8.L.3.1)
Biodiversity in a Bag	Students will select animals from bags and describe them through specific vocabulary related to biodiversity Tennessee (8.5.1 8.5.2 8.5.3 8.5.5) North Carolina (8.L.3.2 8.L.3.3)
Feeding Frenzy	Students will consider the food web and what habitat is suitable for each organism using animal cards. Focus will be on energy transfer Tennessee (6.2.1 6.2.2 6.2.3) North Carolina (6.L.2 8.P.2 8.L.3)
Classification of Life	Animal and Plant search takes place in school yard with follow-up classification questions. Optional challenge includes creating a graph for the findings Tennessee (6.2.3 8.5.1 8.5.2) North Carolina (6.L.2.1 6.L.2.3 8.L.3.2 8.L.3.3)
The Rules of the Tools	Groups of students will conduct a biological inventory of organisms using provided tools that scientists themselves use. Tennessee (8.5.1 8.5.2) North Carolina (8.L.3)
Mini-ATBI (Part I) 6.2.3	Students explore environmental factors affecting biodiversity and explore scientific study methods Tennessee (6.2.3) North Carolina (6.L.2.2 6.L.2.3 8.P.2.1 8.P.2.2)
Naming a Discovery	Students learn classification system and explore order of insects Tennessee (8.5.2) North Carolina (8.L.3.3)
Mini-ATBI (Part II)	Students study life in different habitats using provided materials, and then compare habitats using scientific method Tennessee (6.2.1 6.2.4 8.5.4) North Carolina (6.L.2.3 8.P.2 8.L.3)
Mini-ATBI (Part III)	Students conclude their inventory by analyzing results via data sheet and comparing with others Tennessee (6.2.3 6.2.4 8.5.4) North Carolina (8.P.2)
Drawing Connections	Students challenged to helped increase biodiversity after they learn about environment depletion Tennessee (6.2.3) North Carolina (8.P.2)

Materials

Teacher Curriculum Guide (1)	Plastic Stakes with Ribbons (12)
Animal Replicas (30)	Shaker Box Sets (6)
Aspirator Set (6)	Forceps (6)
Plastic Encased Thermometers (2)	Bug Magnifier Viewing Boxes (6)
Collapsible Umbrellas (6)	Wood Sticks (6)
Tent Stake Mallet (1)	Meter Tape (1)
Sweep Net with Handle (1)	Animal Model Set (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

8.5.2 Use a simple classification key to identify a specific organism

-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).