

Wet Places

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.

Wet Places in the Great Smoky Mountains National Park include streams, waterfalls, ponds, and cave pools. Students learn the importance of wet places in the Smoky Mountain ecosystem by examining the different aquatic species, and how each species contributes to its environment. Acidity of water systems as well as their quality are examined through these activities, enabling students to engage in analytical learning while also having fun.

Activities

Ecosystem Mobiles	Students construct Mobiles for Abram's Creek, Springs, Seeps, and Wet Caves Tennessee (6.2.3 6.2.4 8.5.3 8.5.5) North Carolina (8.P.2 8.L.3.1)
You Study What?	Students read about "copepodologist" Janet Reid Tennessee (6.2.1 6.2.2 6.2.3 8.5.1 8.5.3 8.5.4) North Carolina (6.L.2.3 8.L.3)
Viewing Plankton	Students use Discovery Scopes to view plankton collected with a plankton net Tennessee (6.2.2 6.2.3 6.2.4 8.5.4 8.5.5) North Carolina (6.L.2.1 6.L.2.2 8.L.3.2 8.L.3.3)
Hard as Nails?	Students test the hardness of water samples Tennessee (6.2.3 6.2.4 8.5.3 8.5.4) North Carolina (6.L.2.3 8.L.3.1 8.L.3.3)
Do We Have Acid Rain?	Students test the pH of various water samples Tennessee (6.2.3 6.2.4 8.5.3 8.5.4) North Carolina (6.L.2.3 8.L.3.1 8.L.3.3)
Streams Puppet Show	Students present a puppet show that teaches the adaptations of stream and pond creatures to aquatic life Tennessee (6.2.1 6.2.2 6.2.3 6.2.4 8.5.3 8.5.4 8.5.5) North Carolina (6.L.2.2 6.L.2.3 8.L.3.2 8.L.3.3)
Macro Mania	Students learn how macroinvertebrate sampling is used to assess stream health, by means of a simulation Tennessee (6.2.1 6.2.2 6.2.3 6.2.4 8.5.3 8.5.4 8.5.5) North Carolina (6.L.2.3 8.P.2.2 8.L.3)
Meet the Trout	Students use images in the Great Smoky Mountains Fishing Regulations brochure as a guide to color distinguishing features of the three trout species in the Park Tennessee (6.2.1 6.2.3 8.5.3 8.5.4 8.5.5) North Carolina (6.L.2.1)
Brook Trout Rummy	Students play a rummy-like card game to learn the three conditions used to pick stream locations for Brook Trout Restoration Projects in the Park Tennessee (6.2.3 6.2.4 8.5.4 8.5.5) North Carolina (6.L.2 8.P.2.2 8.L.3.2)

Fishy Who's Who	Students share information on laminated Fact Sheets on TN fish and compare and contrast their features Tennessee (6.2.1 6.2.2 6.2.4 8.5.1 8.5.3 8.5.4 8.5.5) North Carolina (8.L.3.1 8.L.3.3)
Stream Sampling	Students use sampling gear to collect tiny creatures that live on or in the stream bottom Tennessee (6.2.1 6.2.2 6.2.3 6.2.4 8.5.3 8.5.5) North Carolina (8.P.2.2 8.L.3.2 8.L.3.3)

Materials

Teacher's Guide	Plankton Net (1)	Discovery Scope Kits
Streams Puppet Shows (Scripts, Puppets, Props)	Hardness Test Kits (1 set of Sample Jars, Testing Directors)	pH Testing Supplies (Color Charts, Cups, Filters)
Laminated pH Maps (7)	Macro Mania Game	Laminated How-To Sheets
<i>GSMNP Fishing Regulations</i> (11)	<i>Brook Trout Folio</i> (7)	Trout Rummy Game Card (7 sets)
Nature Sounds CD (1)	Laminated Fish Cards	Dropper Bottle

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).