



WHAT MAKES THE GREAT SMOKIES GREAT?

THEME: Biodiversity
GRADE LEVEL: Third
BEST TIME TO PLAN TRIP: Fall or Spring

*Ranger Led
Program*

UNIT RATIONALE:

Great Smoky Mountains National Park is world-renowned for the diversity of plants and animals. With over 1,400 flowering plant species, the park offers students an ideal opportunity to investigate the myriad of ways plants adapt to this mountainous region. Soil properties play a tremendous role determining the quantity and types of plants found in the park. Students use tools and tests to investigate the forest soil and improve their understanding of soil properties and the soil cycle.

STATE CURRICULUM STANDARDS: NORTH CAROLINA (THIRD GRADE)

SCIENCE

3.L.2 - Plant survival

- 3.L.2.1 - Remember the function of the following structures as it relates to the survival of plants in their environments: Roots - absorb nutrients; Stems - provide support; Leaves - synthesize food; Flowers - attract pollinators and produce seeds for reproduction.
- 3.L.2.2 - Explain how environmental conditions determine how well plants survive and grow.
- 3.L.2.3 - Summarize the distinct stages of the life cycle of seed plants.
- 3.L.2.4 - Explain how the basic properties (texture and capacity to hold water) and components (sand, clay, and humus) of soil determine the ability of soil to support the growth and survival of many plants.





TABLE OF CONTENTS

Activity	Page
Unit Rationale/ State Learning Standards.....	1
Table of Contents	2
Planning your Trip.....	3
Safety	4
Background Information.....	5
Map to Collins Creek Picnic Area.....	6
Map to Deep Creek Picnic Area.....	7
Pre-Site Activities	
Pre and Post-Site Test.....	8
Pre and Post-Site Test Answer Sheet.....	9
Food Chains	10-13
On-Site Activities	
Park Ranger Directed Lessons	14
Post-Site Activities	
Explore Your National Parks	15
Appendix	
Parent/Chaperone Letter	16



PLANNING A SUCCESSFUL TRIP

WHAT MAKES THE GREAT SMOKIES GREAT?



SCHEDULE FOR A DAY OF ACTIVITIES IN GREAT SMOKY MOUNTAINS NATIONAL PARK Collins Creek or Deep Creek

Morning:

- Meet park ranger at picnic area
- Use restrooms
- Large group introduction
- Break into 2 groups
- Plant/Habitat Walk
- Lunch
- Soil Exploration and Journaling
- Large group conclusion

Planning a Successful Trip

- Check the weather before you go.
- School buses can park at the program site.
- The maximum number of students for this trip is 50. One adult chaperone is required for every eight students.
- Be sure that chaperones are aware of the short hiking portion of this trip.
- Students may leave their lunches on the bus. Teachers and chaperones should bring picnic blankets for the students to sit on. All trash must be carried back to school. NEVER leave food unattended.
- Restrooms and seasonal water fountains are available. Groups should bring their own drinks.
- Be sure that chaperones are aware of the short hiking portion of this trip.



SAFETY CONSIDERATIONS AND OTHER IMPORTANT INFORMATION



- Great Smoky Mountains National Park is a federally protected public use area. Please help the rangers keep all of the plants and animals protected in the park by not picking the plants or taking anything from the park.
- Please remind your students to wear appropriate footwear and clothing for this extended outdoor experience. Flip flops, slip-on shoes, or sandals are not appropriate for the program.
- Temperatures in some parts of the park can be 10-15 degrees colder than at your school. Long pants and layers are suggested for the program. Pants are the best precaution against cool temperatures, bee stings, ticks, and poison ivy.
- Within the park, cell phones are not always reliable. Rangers will follow the on-site agenda. If an unexpected problem occurs, rangers do carry park radios to make contact with the park dispatch office. For non-emergencies, call the Park Ranger dispatch at 865-436-1230 or contact a park employee.

Animals and Plants of Concern in the park

- All animals in the park are wild and their behaviors are unpredictable. Treat all animals with caution.
- Venomous snakes - Two species of venomous snakes live in the Smokies, the copperhead and timber rattlesnake. Students should be cautious where they place their hands and feet.
- Insects - Yellow jacket wasps are the insects of greatest concern. They build nests in the ground along trails and streams and are aggressive when disturbed. Stings cause local swelling and can lead to severe allergic reactions in sensitive individuals. Such persons should carry epinephrine kits.
- Poison Ivy - Poison ivy is a three-leaved plant which can grow on the ground as well as on “hairy” vines up trees. To avoid chances of an allergic reaction wear long pants, stay on trails, and avoid direct contact with vegetation. If contact occurs or is a concern, wash affected parts in cold soapy water immediately.
- It is extremely helpful to rangers leading the program for students to wear clearly labeled name tags with first names only.
- Pets are not allowed on most park trails. Please do not bring them on the field trip.
- For more information about the park (Things to Know Before You Come) please visit the park’s website: <http://www.nps.gov/grsm/planyourvisit/things2know.htm>





BACKGROUND INFORMATION

Park Description:

The National Park Service is charged with the management and preservation of the nation's most precious natural and cultural resources. These resources are woven into our natural heritage, and they provide opportunities for recreation, appreciation of beauty, historical reflection, cultural enrichment, and education.

Great Smoky Mountains National Park is one of the largest protected land areas east of the Rocky Mountains. With over 500,000 acres (800 square miles) of forest, the Smokies contain an enormous variety of plants and animals. In terms of biological diversity, a walk from a mountain's foot to its peak is comparable to the 2,000 mile hike on the Appalachian Trail from Georgia to Maine.

Because the National Park Service is charged with protecting resources and natural systems, the park engages in comprehensive research programs, such as air quality monitoring, to foster an understanding of park resources and to show how they are affected by local, regional, and global influences. Since the Smokies are so biologically diverse, the park is designated as an International Biosphere Reserve by the United Nations. The international system contains over 320 reserves in over 80 countries with the primary objectives of conserving genetic diversity and coordinating environmental education, research, and monitoring.

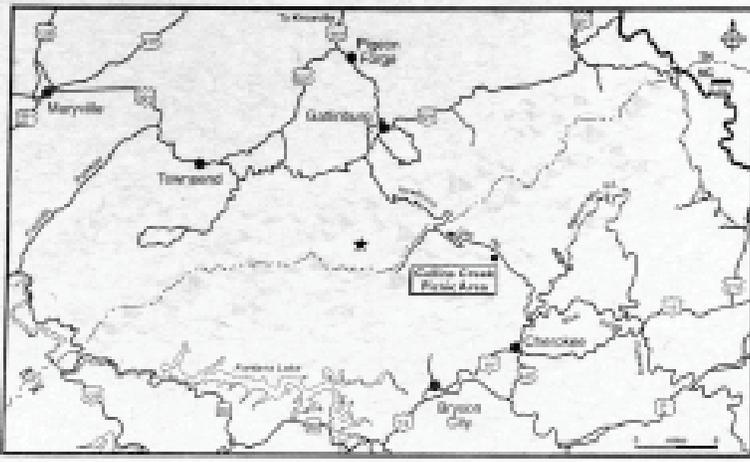
The Smokies also have a rich cultural history. Native Americans have lived in this area for thousands of years, and permanent white settlement began around 1800. The coming of commercial logging around 1900 stripped trees from two-thirds of what is now park land. Established in 1934, the park was created from more than 6,000 tracts of private and commercial land that was bought mostly with money raised and privately donated. Centrally located within a two-day's drive for half of the nation's population, Great Smoky Mountains National Park has the highest visitation of all the national parks in the country.

Collins Creek Picnic Area Description:

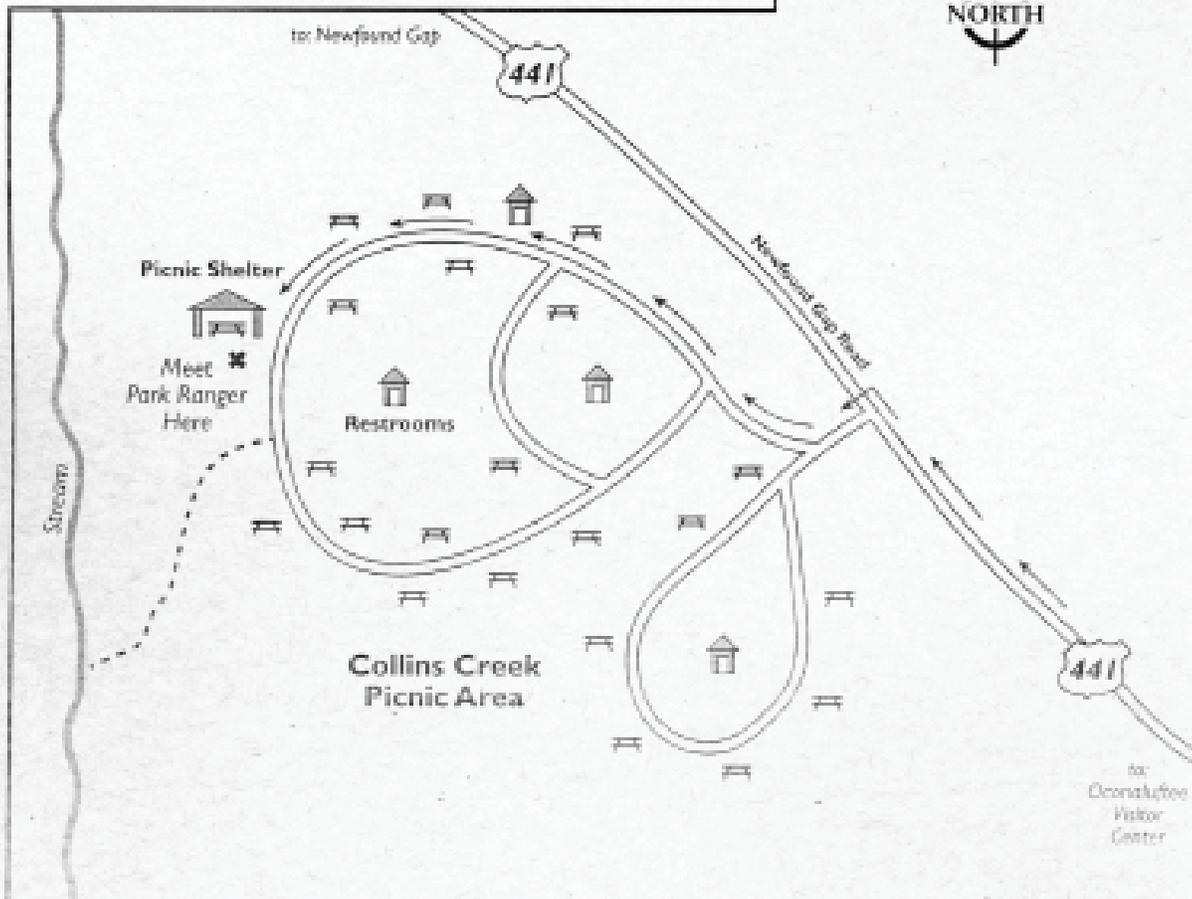
At 2500' in elevation, this lush picnic area is part of the most botanically diverse forest type in the Smokies, the Cove Hardwood forest. Between 40 to 60 tree and shrub species grow in coves, which are sheltered valleys with deep rich soils. Common species include Carolina silverbell, basswood, dogwood, and magnolia. In the upper picnic area there is a ½ mile Quiet Walkway bordering lovely Collins Creek. The Collins Creek trail is one of the oldest trails accessing Thomas Divide and follows an old roadbed that once was used to haul lumber from the mountains and usher livestock up to the cool balds in the summer.



MAP OF COLLINS CREEK PICNIC AREA



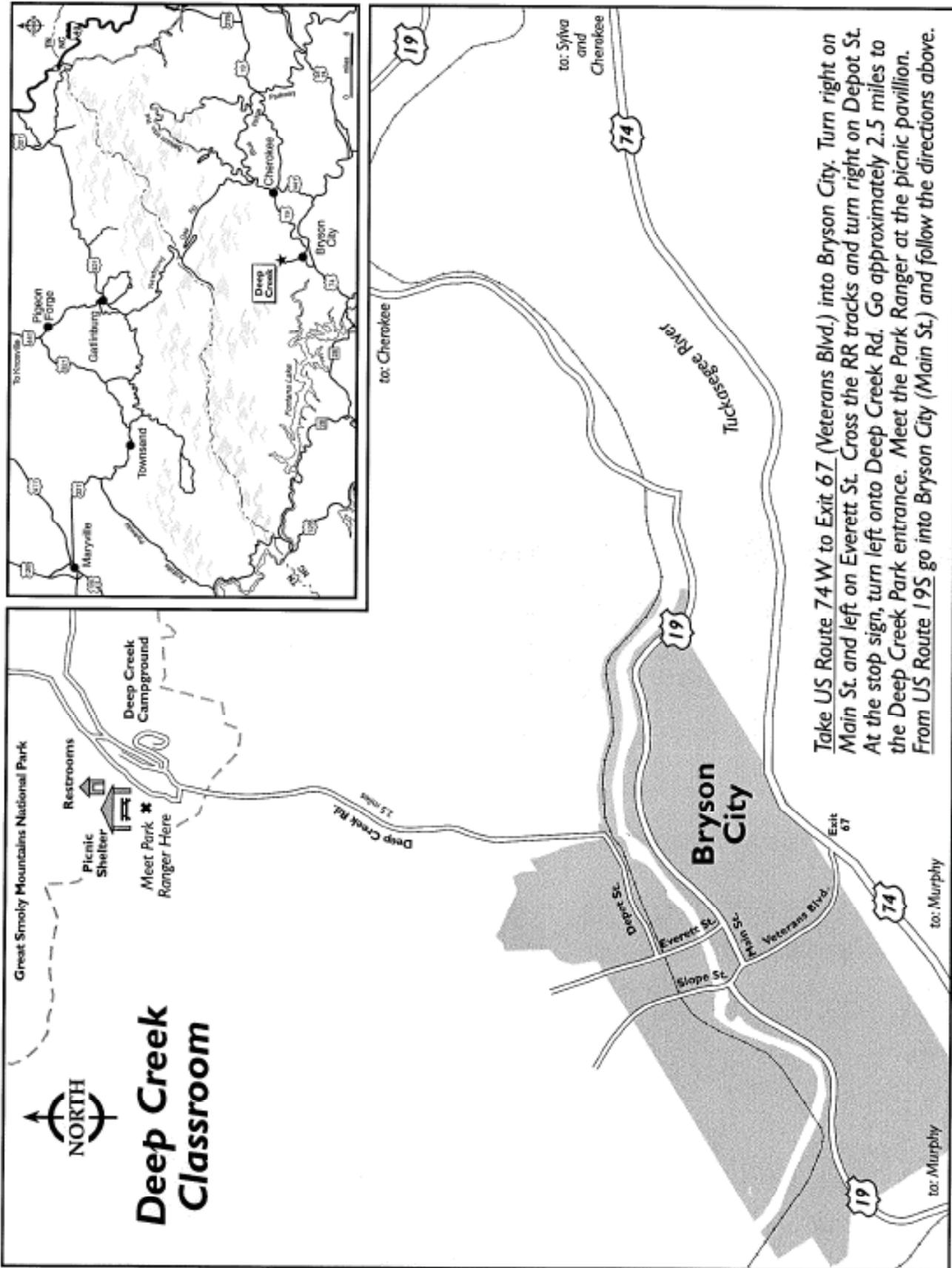
Habitat Diversity Classroom at Collins Creek Picnic Area



From Cherokee, NC take US Route 441 North into Great Smoky Mountains National Park. Pass the Oconaluftee Visitor Center and travel approximately 5 miles to the Collins Creek Picnic Area. Turn left into the picnic area and stay to the right. Proceed around the loop to the picnic shelter.



MAP TO DEEP CREEK PICNIC AREA



PRE AND POST SITE TEST

Name _____



Habitat Diversity

Circle the correct answer:

1. A person who studies soil is called an ____.	Agronomist	Ornithologist	Entomologist
2. Soil is created by both decomposition and weathering.	True	False	
3. In a food chain, people are considered ____.	Producers	Consumers	Decomposers
4. Animals that are active at night are ____.	Diurnal	Nocturnal	Periodic
5. An animal that feeds upon other living animals is a ____.	Decomposer	Producer	Carnivore
6. The ability of a plant or animal to adjust to its surroundings so that it can survive is ____.	Adaptation	Not possible	Habitation
7. The path energy takes when one living thing eats another is a ____.	Food Chain	Niche	Consumer
8. A habitat includes the animal's food, water, shelter, and space.	True	False	
9. Water pollution can damage a habitat.	True	False	
10. There are many different habitats in the Great Smoky Mountains.	True	False	
11. The source of almost all energy on earth is the moon.	True	False	
12. The ability for an animal to blend in with its environment is called ____.	Carnivore	Niche	Camouflage
13. A plant or animal from another country that causes harm in the Great Smoky Mountains is ____.	Native	Invasive Exotic	Nocturnal
14. Living things that break down matter so that it can be used by plants are ____.	Decomposers	Consumers	Producers
15. Animals can be both prey and predator.	True	False	
16. An organism that could be found in soil is a ____.	Lady bug	Centipede	Monarch Butterfly
17. Examples of traces left by animals in the soil are ____.	Tracks and tunnels	Decomposing Leaves	Arrowheads



PRE AND POST SITE TEST

ANSWER KEY



(Teachers: Administer this test once before teaching the pre-visit activities and once after the post site activities for comparable results of comprehension and retention.)

1. A person who studies soil is called an ____.	<i>Agronomist</i>	Ornithologist	Entomologist
2. Soil is created by both decomposition and weathering.	<i>True</i>	False	
3. In a food chain, people are considered ____.	Producers	<i>Consumers</i>	Decomposers
4. Animals that are active at night are ____.	Diurnal	<i>Nocturnal</i>	Periodic
5. An animal that feeds upon other living animals is a ____.	Decomposer	Producer	<i>Carnivore</i>
6. The ability of a plant or animal to adjust to its surroundings so that it can survive is ____.	<i>Adaptation</i>	Not possible	Habitation
7. The path energy takes when one living thing eats another is a ____.	<i>Food Chain</i>	Niche	Consumer
8. A habitat includes the animal's food, water, shelter, and space.	<i>True</i>	False	
9. Water pollution can damage a habitat.	<i>True</i>	False	
10. There are many different habitats in the Great Smoky Mountains.	<i>True</i>	False	
11. The source of almost all energy on earth is the moon.	True	<i>False</i>	
12. The ability for an animal to blend in with its environment is called ____.	Carnivore	Niche	<i>Camouflage</i>
13. A plant or animal from another country that causes harm in the Great Smoky Mountains is ____.	Native	<i>Invasive Exotic</i>	Nocturnal
14. Living things that break down matter so that it can be used by plants are ____.	<i>Decomposers</i>	Consumers	Producers
15. Animals can be both prey and predator.	<i>True</i>	False	
16. An organism that could be found in soil is a ____.	Lady bug	<i>Centipede</i>	Monarch Butterfly
17. Examples of traces left by animals in the soil are ____.	<i>Tracks and tunnels</i>	Decomposing Leaves	Arrowheads



PRE-SITE ACTIVITY

FOOD CHAINS



Grade Level: Third

Subject Area: Science

Activity time: 30 minutes

Setting: In the classroom

Skills: Classifying, Connecting, Discussing, Hypothesizing, Identifying cause and effect, Listening, Predicting, Sequencing

Vocabulary:

* **Carnivore:** An animal that eats meat.

* **Consumers:** Organisms that eat other living things to get their energy

* **Decomposer:** An organism that feeds on and breaks down dead plant or animal matter, making organic nutrients available to the ecosystem

* **Herbivore:** An animal that eats plants

* **Omnivore:** An animal eats both plants and meat.

* **Predator:** An animal that hunts it's food.

* **Prey:** An animal that is being hunted.

* **Producers:** Organisms that don't eat other living things for energy. Plants are producers and get their energy from sunlight.

* **Scavenger:** An animal that feeds on the remains of dead plants and animals.

Objectives:

- 1) explain ways plants and animals need and interact with one another.
- 2) understand what a food chain is and their own place in one.
- 3) understand what happens when a food chain is disrupted.

Materials:

- * Food Chain Cards (on following pages)
- * Ball of yarn

Background:

The park's fundamental significance is that it is a sanctuary for a remarkably diverse array of native plants and animals. Today a large part of Great Smoky Mountains National Park is a relatively undisturbed ecosystem, in sharp contrast to nearly every other land area of the Eastern United States. The undisturbed ecosystem values include natural communities with endemic gene pools providing opportunities for scientific research and education. These natural systems can be used as an indicator of change occurring locally, regionally, nationally, and internationally.

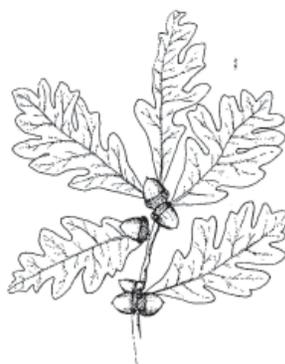
Understanding food webs and monitoring their elements is one way to assess the health of a habitat. In this activity, students will connect components of a food web, while understanding that a food chain is the flow of energy from plants (producers) to other animals (consumers).

Procedure:

Arrange students in a circle. Pass out the food chain cards (one per student). Select one student to be the "soil". Give the end of the ball of yarn to this student. With the student holding the end, ask them to toss the yarn to the next food chain components which depend on the soil (vegetation and mushrooms). The final student in the vegetation and mushroom group should toss the yarn to the consumers of vegetation and mushrooms (herbivores). These students will then toss the ball to the next level of consumers (carnivores), and then the to the omnivores. The yarn will be crisscrossed across the circle to show the complexity of a food web.

Ask the students what would happen if one of these organisms left the ecosystem either because of natural or man-made causes. Have the students discuss which of their cards is most important to the balance of the food web and have them explain why. Guide student discussion of the value of all life forms. The facts are that all of the components are critical to the health of the ecosystem and we are all interconnected.





Shanon

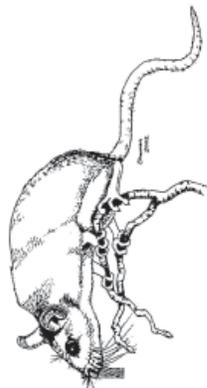
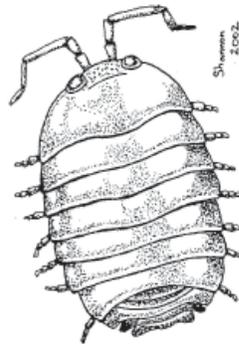
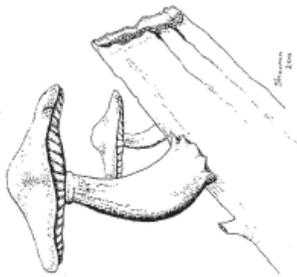
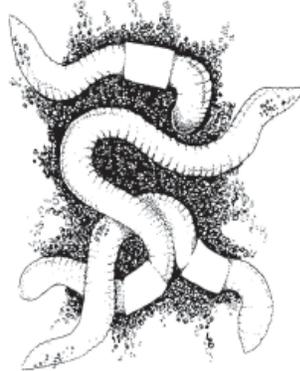


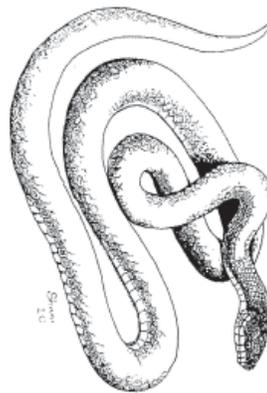
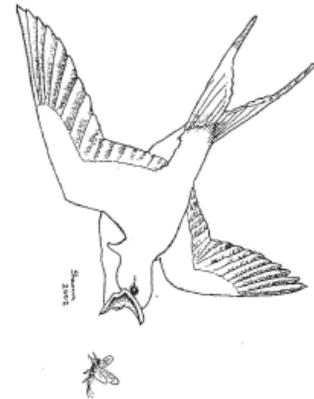
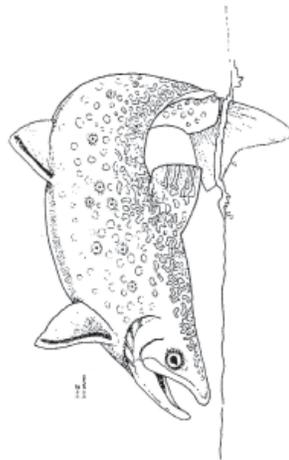
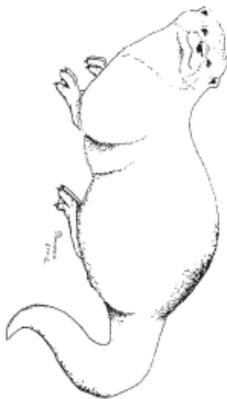
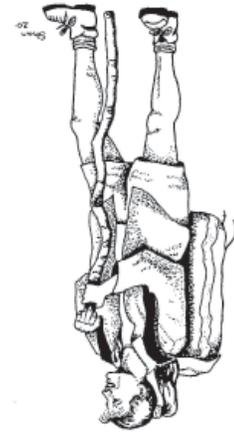
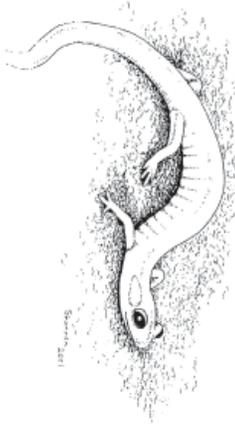
Shan



Shanon
2011







ON-SITE ACTIVITY

PARK RANGER DIRECTED LESSONS



Grade Level: Third

Subject Area: Science

Activity time: 3 hours
(including a lunch break)

Setting: Outdoors in the park

Skills: Brainstorming, Classifying, Collecting information, Communicating, Connecting, Constructing, Decision making, Describing, Demonstrating, Designing, Discussing, Formulating questions, Problem solving, Proposing solutions, Public speaking, Recording data

Vocabulary: Adaptation; camouflage; decomposers; exotic; food chain; habitat; invertebrate; predator; pollution; weathering

Objectives:

- 1) explain the role of decomposition.
- 2) understand interrelationships between living and non-living components of the environment.
- 3) name the four major components of habitat.
- 4) identify several ways humans can have both negative and positive affects of the environment.

Materials: provided by park rangers

Background:

The following is a brief description of possible activities for your on-site visit. These activities will be led by park staff, but please be familiar with them, as the classroom teacher may be asked to assist on-site.

Habitat/Plant Walk (45 minutes - 1.5 hours)

Rangers will lead students on a walk through the forest and focus on plant life cycles and adaptations. At Deep Creek students can also visit one of the park's many waterfalls.

Soil Inventory (30 minutes)

The park rangers will introduce soils as a habitat. Students will be asked to "cook" up soil using selected ingredients. Students will then be divided into small teams to inventory a small plot of soil, while keeping a written record of what they discover.

Macroinvertebrate Search (30 minutes)

Students use scientific tools to investigate what organisms live in soil and decomposing leaves. The important role these organisms play will be discussed.

Nature Journaling (30 minutes)

Making observations is an important part of exploration. Students will have an opportunity to practice documenting what they are experiencing in nature.



POST-SITE ACTIVITY

EXPLORE YOUR NATIONAL PARKS



Grade Level: Third

Subject Area: Science

Activity time: 30 minutes

Setting: Indoors

Skills: Computer skills, research, collecting information, connecting, brainstorming, analyzing, presenting, communicating

Background:

The Great Smoky Mountains are world renowned for their diversity of plant and animal species. This great variety makes the park an exemplary outdoor laboratory for the study of relatively undisturbed native flora, fauna, physical environs, and processes of the Southern Appalachians. The park is the largest federally preserved and protected upland area east of the Mississippi River offering park visitors a refuge from the stresses of everyday life.

You and your students can learn more about this special place as well as participate in on-line activities to further your knowledge of the National Park Service and other federally protected lands.

Please check out the following web addresses:

Especially for Kids

To learn how to become a web ranger for the National Park Service, go to:

www.nps.gov/webrangers

To learn how to become a Junior Park Ranger at Great Smoky Mountains National Park or other parks, go to:

www.nps.gov/learn/juniorranger.htm

Objectives:

To teach students about the various aspects of the National Park Service.

Materials: internet access

Especially for Teachers

For a comprehensive understanding of the background and development of the National Park Service, that is perfect for teachers and others those who need the maximum amount of accurate information in the minimum amount of time, go to:

<http://www.ParkTraining.org>

The U.S. Department of Education is pleased to announce the newly remodeled and updated Federal Resources for Education Excellence (FREE) website. It now provides richer, more expansive resources to teachers and students alike. There are over 1,500 resources to take advantage of at FREE ranging from primary historical documents, lesson plans, science visualizations, math simulations and online challenges, paintings, photos, mapping tools, and more. This easily accessible information is provided by federal organizations and agencies such as the Library of Congress, National Archives, National Endowment for the Humanities (NEH), National Gallery of Art, National Park Service, Smithsonian, National Science Foundation (NSF), and National Aeronautics and Space Administration (NASA). Go to: <http://www.free.ed.gov/>



PARENT/CHAPERONE LETTER



Greetings Parents/Chaperones:

Park rangers are pleased to be presenting an educational program to the students in Great Smoky Mountains National Park. In order to achieve the goals for a successful program, the park rangers will need your assistance in the following ways:

(These points will help to ensure that park rangers and teachers will be able effectively conduct the lessons and activities throughout the trip.)

- The program will be conducted outside and there will be some hiking throughout the trip. Prepare your student with appropriate footwear, long pants, layers, and rain gear.
- If your child is bringing a lunch from home, we recommend that students bring water to drink and a lunch with minimal packaging. Soft drinks are usually left unfinished by students, and remaining sugary drinks cannot be poured out on the ground. (Minimally packaged lunches lead to less trash being left behind or scattered by the wind. Additionally, this reduces the accumulated trash to be disposed).

If you are a chaperone attending the field trip:

- Please be an active part of the lessons. Keep up with the group and listen to the information being given in the case that you may be called upon to assist (handing out materials, sub-dividing groups etc.).
- Please do not hold conversations with other chaperones or use a cellular phone while the rangers are teaching the students.
- Refrain from smoking during the trip. If you must smoke, please alert a ranger or teacher and remove yourself from the group.
- Please be aware that the program will be conducted outside and that there will be some hiking throughout the trip. Prepare yourself with appropriate footwear, long pants, layers, and rain gear.
- We recommend that parents and students bring a small towel in their backpacks to sit on at lunch (there are no picnic tables at the program site).

Thank you for your needed assistance. We look forward to meeting you on the program!

Sincerely,

The Education Staff at Great Smoky Mountains National Park

