JONES GAP
STATE PARK

Mountain Bridge Wilderness Area Headquarters
Caesars Head State Park
8155 Geer Highway, Cleveland, SC 29635
(864) 836-6115

Jones Gap

Directions
Jones Gap State Park is located northwest of Greenville, South Carolina off U.S. Highway 276. From Greenville take Highway 276 north to Cleveland. Take River Falls Road; the road ends in the park.

Park personnel will meet you at the parking lot entrance. Please keep all students on the bus until further instructions are given.

Facilities
The Learning Center for the Mountain Bridge Wilderness Area is located at Jones Gap State Park. The Learning Center includes a large classroom/meeting room and a separate laboratory.

Restroom facilities and water fountain are located between the parking area and the Learning Center.

Picnic tables are available in the park for students to have lunch or enjoy a snack.

The Mountain Bridge Wilderness Area is a Project Green area. As part of "Leave No Trace", all park visitors are asked to pack out whatever they bring in. Visiting schools are asked to bring trash bags to take back all of the trash produced from lunch and snacks.

Option: To allow students to participate in a real "Leave No Trace" experience, have students pack their lunches in their backpacks (book bags) and carry their own lunch and their own trash out!

Reservations and Program Information
For reservations, contact:
Tim Lee
Park Interpreter
Phone: (864) 836-6115
Fax: (864) 836-3081
tlee@scprt.com

Program Info:
Program offered September - mid November and March - May
1 – 25 students.....$40
26 – 40 students.....$80
41 – 60 students.....$120

What to Bring
Students:
- rain gear (raincoat, pants, etc.)
- one pair dry socks
- change of dry clothes
- jacket

Teachers:
- first aid kit
- name tags
- trash bags for garbage

Program Description

The Mountain Bridge Wilderness Area contains more than 10,000 acres in northwestern South Carolina. This area of the Blue Ridge Escarpment ends in an abrupt drop of 2,000 feet to the foothills below, where the state's Piedmont Region begins. This escarpment creates spectacular waterfalls, and provides a protective environment for rare and endangered plant and animal species.

The Middle Saluda River provides a habitat for a diversity of cold-water organisms including native brook trout, salamanders, crayfish, and other cold-water animals. Students discover how these organisms interact as they explore the river, turning over rocks in their study of a cold-water habitat.

Students also hike and learn about different plant and animal species of the forest. Through hands-on activities, students learn how interactions among these organisms define a mountain forest community.

Goals

Foster an understanding and appreciation of the natural resources found in the mountains of South Carolina.

Make connections between the natural world and themselves.

Encourage creative thinking using a problem-solving approach.

Encourage stewardship of South Carolina's natural resources.

Typical Discover Carolina Program Schedule

9:30 AM
Arrival at park (unload lunches and use the rest rooms)

10:00 AM
Introduction

10:30 AM – 12:00 Noon
Morning Classes

12:00 Noon – 12:30 PM
Lunch

12:30 PM – 2:00 PM
Afternoon Classes

2:00 PM
Depart

Discover Carolina Checklist -- Things to Consider Before Your Visit

Prior to Visit:

___ Send out chaperone agreements
___ Complete pre-visit site activities
___ Create student name tags
___ Collect signed chaperone agreements
___ Confirm bus
___ Discuss park etiquette and safety
___ Contact interpreter if you have any special needs

Day of Visit:

___ First aid kit
___ Contained lunches
___ Name tags
___ Water bottles
___ Ample # of chaperones
___ Students are dressed for the weather
___ Evaluation needs

Jones Gap State Park: *River Pre-Site*

Jones Gap: *Pre-Site*

Content Area:
Science

Grade Level:
3

Time to Complete:
45 minutes

Title of Program:
How Cold is Cold?

South Carolina State Standards Addressed

3-1.3 Generate questions such as "what if?" or "how?" about objects, organisms and events in the environment and use those questions to conduct a simple investigation and compare the result with the prediction.

3-1.5 Use tools (including beakers, meter tapes and sticks, foceps/tweezers, tuning forks, graduated cylinders and graduated syringes) safely and appropriately when gathering specific data.

3-1.6 Infer meaning from data communicated in graphs, tables and diagrams.

Program Description

Students will conduct activities to learn how to properly use a thermometer to determine the temperature of water and conduct an experiment to determine how light affects water temperature.

Focus Questions For Students

Name an instrument used to measure temperature?

What are some things that affect temperature?

What is thermal pollution?

Culminating Assessment

Graph the temperature readings, time versus temperature.

Have students predict temperature of water after 20 minutes.

Material/Equipment/Resources

- Alcohol filled thermometers (1/group)
- 250ml Graduated Beakers (3/group)
- Timer

Teacher Preparation

Read background information and be prepared to introduce temperature as a physical characteristic of an object (water).

Demonstrate to students the correct and safe way to use a thermometer and other equipment.

Background Information

Temperature is a physical property of an object that measures the amount of energy in an object. This energy can be measured by a thermometer and recorded in degrees (Fahrenheit or Celsius).

Procedures

1. Collect 3 100ml samples of water from the coldwater tap.
2. Hold the end of the thermometer opposite the bulb.
3. Place the thermometer in each sample for three minutes.
4. Raise the thermometer and quickly read the temperature. Place the thermometer back in water for 1 minute and read. If temperature did not change, record temperature. If the temperatures are different repeat steps 2 thru 4.
5. Place 1 coldwater sample in direct sunlight for a period of 10 minutes. Repeat steps 2 thru 4.
6. Place 1 coldwater sample in a dark area of the room. Repeat steps 2 thru 4.
7. Leave 1 coldwater sample in an area with normal room lighting to act as a control. Repeat steps 2 thru 4.
8. Compare the initial temperature of the water samples to that of the samples after the 10-minute period.
9. Infer as to what may be responsible for any temperature differences.

Differentiation of Instruction

1. Changing the color of the water sample to determine if color affects temperature.
2. Changing the depth of the water sample to determine the affects of water depth on temperature.

References

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Informational Books for Teachers

Pond and Brook; Michael J. Caduto

Eyewitness: Pond and Stream

How To Know The Aquatic Insects; Dennis M. Lehmkuhl

Activity Guides

Aquatic Project Wild
- Riparian Retreat
- Fishy Who's Who

SC MAPS
- Activity 1-2
  - Performance Task 1, Trace The Santee drainage basin
  - Performance Task 4, Write a story about salamanders river journey

Project WET
- Macroinvertebrate Mayhem

Children' Books

Webs of Life: Mountain Stream; Paul Fleisher

Water Insects; Johnson

Websites (March 2010)

Insects: http://entweb.clemson.edu/museum/misc/aqua/index.htm

SC Rivers: http://www.riverventure.org/

For additional sites, use following "search" words: aquatic insects, salamander, trout and coldwater habitat.

Jones Gap State Park: *River On-Site*

Content Area:
Science

Grade Level:
3

Time to Complete:
1.5 hours

Title of Program:
Cold River Habitat

South Carolina State Standards Addressed

3-1.5 Use tools (including beakers, meter tapes and sticks, foceps/tweezers, tuning forks, graduated cylinders and graduated syringes) safely and appropriately when gathering specific data.

3-2.2 Explain how physical and behavioral adaptations allow organisms to survive (including hibernation, defense, locomotion, movement, food obtainment and camouflage for animals and seed dispersal, color and response to light for plants).

3-2.3 Recall the characteristics of an organism's habitat that allow the organism to survive there.

Program Description

Students will conduct a survey of the Middle Saluda River to determine the organisms that live there and how they are adapted for their environment. Organisms collected, water temperature and pH will also be used to determine water quality in the river.

Focus Questions For Students

What is a mountain river?

What types of plants and animals would you expect to find in the river?

Where would you expect to find animals in the river? Why?

What are the main requirements for a cold-water habitat?

How are plants and animals adapted for life in a mountain river?

Culminating Assessment

Complete post-visit activities

Material/Equipment/Resources

At Jones Gap State Park:

- rubber boots
- video microscope
- handouts
- collecting net
- thermometer
- forceps
- collecting pans
- petri dishes
- pipette

Teacher Preparation

1. Call for reservation.
2. Complete all pre-visit procedures.
3. Read Background Information and be prepared to discuss ecology of cold water streams.

Background Information

In South Carolina, mountain river communities are limited to the Blue Ridge geologic region, which comprises less than 2% of the state. By studying these unique ecosystems,

students can gain a better understanding of how to protect and preserve these areas. A good way to explore the mountain river ecosystem is through collecting, observing and identifying the aquatic insects that make up an important portion of the river community. These insects live in or on the water for all or part of their lives. They have various morphological structures that make them well adapted to occupy particular river habitats, as well as camouflage coloration and behaviors that enable them to elude consumers. They are an important member of the food webs that allow larger predators, such as trout, to survive. The aquatic insects, along with several other invertebrates, are used as biological indicators of the quality of rivers.

It is also necessary to understand the physical aspects of this environment, such as water temperature, water pH, amount of dissolved oxygen, and substrate of the river bottom. Some of the fish and aquatic insects have a very narrow tolerance for changes in abiotic conditions. A rise in temperature or a decrease in dissolved oxygen can stress these organisms to the point of death. Additions of sediment or changes in river velocity can adversely affect the organisms within this ecosystem. Therefore, it is necessary to examine the river's watershed for possible changes that could affect the river community. Though natural occurrences within the watershed can result in changes, it is often man's actions that have catastrophic influences. Practices such as logging or construction within the watershed can result in higher water temperatures and increased runoff and the sediments that accompany it. Recreational activities can even influence the conditions necessary for sensitive organisms. These conditions can be investigated by measurements of biotic and abiotic factors made at intervals along the river and by topographic maps and aerial photographs of the watershed.

Procedures

1. Provide students with boots.
2. Select adults to help in the river and brief them on boundaries and rules.
3. Explain safety rules and boundaries to students.
4. Demonstrate how to safely and gently collect organisms. Explain to students that organisms will be returned to river after observations are made.
5. Students will collect organisms from the river and place them in collecting pans.
6. Students will draw and describe how trout are adapted to coldwater rivers.
7. Return to laboratory or group area to identify organisms, discuss adaptations and complete River Survey worksheet.
8. Discuss temperature data collected from river and how these factors affect organisms that live in the river.

River Survey Form

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Discover Carolina
The Mountain Bridge Wilderness Area
River Survey Form

Stream _____ Location _____

Date _____

School or Group Names

_____

_____

Describe River (moving or nonmoving, color of water, bottom (rocky or smooth), shaded or sunny, etc..)

_____

_____

_____

TEMPERATURE _____

Draw the Middle Saluda River habitat.

Jones Gap State Park: *River Post-Site*

Jones Gap: *Post-Site*

Content Area:
Science

Grade Level:
3

Time to Complete:
1.5 hours

Title of Program:
Rivers of South Carolina

South Carolina State Standards Addressed

3-1.5 Use tools (including beakers, meter tapes and sticks, forceps/tweezers, tuning forks, graduated cylinders and graduated syringes) safely and appropriately when gathering specific data.

3-2.2 Explain how physical and behavioral adaptations allow organisms to survive (including hibernation, defense, locomotion, movement, food obtainment and camouflage for animals and seed dispersal, color and response to light for plants).

3-2.3 Recall the characteristics of an organism's habitat that allow the organism to survive there.

Program Description

Students will reinforce concepts and techniques used at Jones Gap by conducting a survey of a river in the region of the state that they live in.

Students will conduct a survey of the river to determine the organisms that live in an aquatic habitat and how they are adapted for their environment. Organisms observed and abiotic characteristics (water temperature, flow, clarity) can be used to describe the river.

Focus Questions For Students

In what region of SC is this river found?

What types of plants and animals would you expect to find in the river?

Where would you expect to find animals in the river? Why?

What are the main requirements for a cold-water habitat?

How are plants and animals adapted for life in a mountain river?

Culminating Assessment

Compare and contrast the river habitat surveyed with the Middle Saluda River, a coldwater river habitat.

Material/Equipment/Resources

River Survey Sheets

Teacher Preparation

1. Choose a study site for your students.
2. Research background information about river(s) that will be surveyed and be prepared discuss possible reasons for why plants and animals are located in certain areas (surface, bottom, bank, etc.).