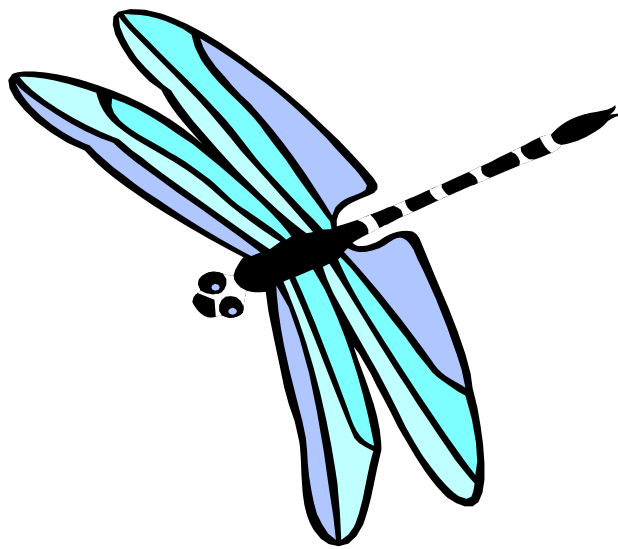


Playcard Environmental Education Center



Playcard Environmental Education Center Pre-visit Information
Loris SC 29569, Ph/Fax : (843) 756-1277
Director, Ben Abercrombie

General Information

Preparing for your Visit

1. Please encourage students to wear closed-toed shoes and clothing appropriate for the weather conditions and be ready to explore nature with all their senses.
2. CHAPERONES: Students should have a 1 adult for every 5 students. This is not a requirement, but does add to the program significantly.
3. Please bring ONE 1 GALLON SIZED ZIPLOCK BAG PER STUDENT for collections.
4. Since Playcard has a large picnic area feel free to bring bag lunches. Recycling will be emphasized during lunch. Please try to minimize the amount of waste that is created on the trip.

Driving to Playcard

To better prepare the students for their field experience, teachers should have the students observe their surroundings as they are driving to the center. Notice the many changing habitats along the way. Play “I spy” with them to see who can name the different habitats along your journey. They should notice the forests, swamps, farms, pastures, towns, ponds, etc. that they see along the way. Show the students the difference between human changed habitats and those primarily left natural. Students will learn how important habitat preservation is during their field trip.

Location and Driving Directions

Playcard Environmental Education Center is located approximately 6 miles west of Loris SC at the intersection of Hwy 19 West and 410. The education building is located approximately .01miles east of the intersection.

From North Myrtle Beach

Hwy 9 to blinking yellow light at the Hwy 410 intersection (Intersection will be located approximately 5 miles North of the hwy 701 overpass), LEFT onto Hwy 410, travel approximately 4 miles turn LEFT on Hwy 19West (You will see Playcard Center sign on left side of intersection) travel .01 miles Center will be on right.

From Conway/701

Hwy 701 N out of Conway approximately 10 miles LEFT at Y intersection onto Hwy 410 Approximately 5 miles RIGHT onto highway 19 W, 0.1miles Playcard Center on Right.

From Conway/701

(Alternate Directions)

Hwy 701 N to intersection of 701 and 410, Stay on Hwy 701 N 5.3 miles past intersection turn LEFT on Hwy 19 W

(Allsbrook Grocery Store is on right side of intersection, large white Victorian style house is on left side of intersection), approximately 2-3 miles Playcard Center on Left

Facilities

Playcard Environmental Education Center is a 200 acre nature preserve. The preserve offers visitors glimpses of how the natural landscape may have looked over 150 years earlier. The bottomland hardwood forests have been virtually undisturbed for over 75 years. The center protects and preserves a beautiful beaver pond swamp that is the hallmark of the area.

The Center offers a nature center, bathroom facilities, picnic areas, 2.5 miles of undisturbed trails including an interactive, self-guiding handicapped nature trail, 2 docks, full-sized Native American tipi village, campsites, authentic pioneer log cabin, kayaks, and gift store.

Playcard School Camps

Overnight camps are offered throughout the school year on Thursday-Friday nights. Camp is designed to immerse the participant in many numerous activities including Project Adventure, kayaking, orienteering, wildlife biology, Native American culture, etc. **Students may sleep in either the Native American Tipi Village and/or the authentic pioneer log cabin. (Cost 15\$/Student Evening meal and breakfast provided). * Limit one class per camp.

Playcard Adventure Summer Camps

Playcard offers summer adventure camps to students from rising 4th – 8th grades. Adventure Camp includes Kayaking, Ropes Skills, Orienteering, basic survival techniques, wildlife and fisheries studies, etc. Call Ben Abercrombie for scheduling. (843) 756-1277.

Reservations and Program Information

Reservations/Program Information: Contact Merry Shelley (843) 488-6755.

Program Information: Ben Abercrombie Teacher/Manager
Playcard Environmental Education Center
10729 Highway 19 West, Loris, SC 29569
Center Phone/Fax: (843) 756-1277
E-mail: babercrombie@horrycountyschools.net

The Center hours are varied; please call for current hours. The nature center does have an answering machine... please leave your name, phone number, reason of call, and the best time to be reached during the day. The best times to call for information are 8:00am to 9:00am and 2pm to 3:30pm. The center is closed on Saturday and Sundays, exceptions include special group Camps, special events, and workdays.

Program Fees

Entrance into the center is free with the purchase of a Playcard Membership. The fees for an interpretive-led field trip to Playcard Environmental Education Center are:

1-16 students = \$35.

17+ students = \$2 per student.

Camp Fees: = \$15per student limit 30 students.

*Chaperones are admitted free. The recommended chaperone ratio (unless noted otherwise) is one chaperone for every five students.

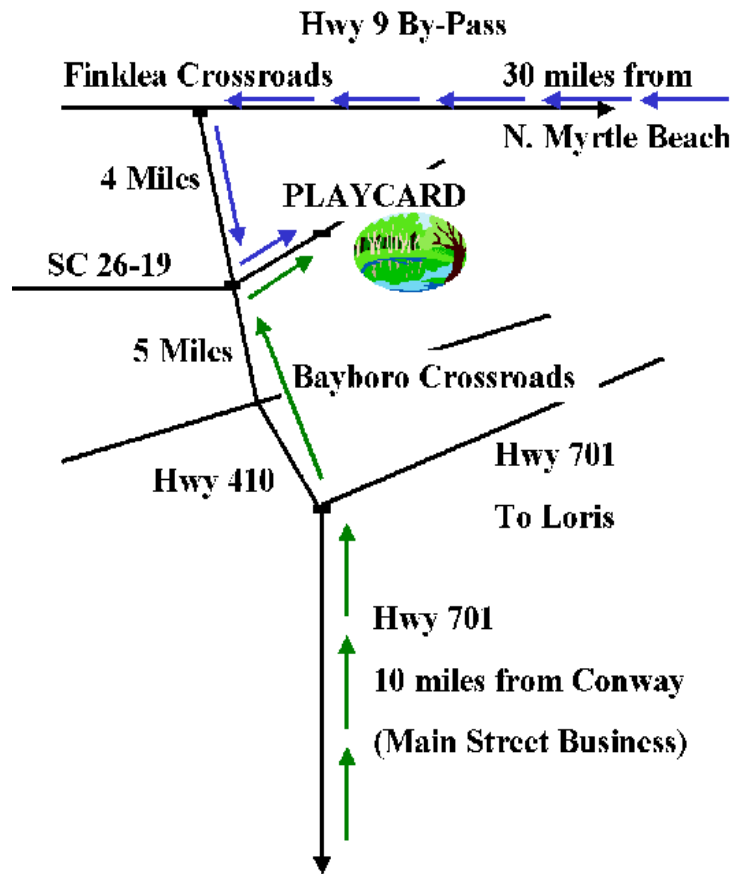
Meeting Spot

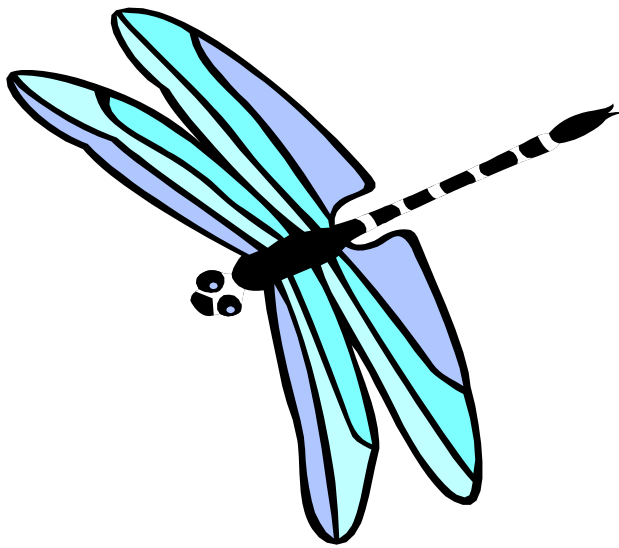
There is visitor parking outside the main classroom building. Individuals are free to enter the main building with adult supervision. A large classroom, bathroom facilities, and a kitchen are located in the main building.

During the Playcard Experience

While in the habitats of Playcard students will not be allowed to keep any live animals or randomly pick any live plants. This is to ensure future groups will enjoy the natural resources of our center. The “Leave only footprints, take only memories” philosophy of land management is encouraged at Playcard. Students are encouraged to pick-up and recycle any man-made litter seen while on the grounds of Playcard.

Map to Playcard





Pre-Visit

Habitats and Food Webs Program

Web-of-Life Activity

Time to Complete: Preparation 30 minutes
Activity: Two 50-minute periods
Complete activity before Playcard Experience

South Carolina Science Standards Addressed

I. Inquiry

A. Process Skills

1. **Observe**
 - a. Use the senses and simple tools to gather information about objects or events such as size, shape, color, texture, sound, position, and change (qualitative observations).
2. **Classify**
 - a. Compare, sort, and group concrete objects according to two attributes.
 - b. Arrange objects in sequential order.

II. Life Science

A. Characteristics of Organisms

1. **Organisms have basic needs and can survive only in environments in which their needs can be met.**
 - a. Describe the diversity of life forms (vertebrate and invertebrate animals and plants) supported by each environment.
 - b. Investigate the relationships between the basic needs of different organisms and whether or not a particular environment meets those needs.
3. **Many characteristics of an organism are inherited from the parents of the organism, but other characteristics result from an individual's interactions with the environment.**
 - c. Distinguish major groups of organisms based on significant characteristics (e.g., body covering, number of legs, body parts, type of skeleton).

B. Organisms and Their Environments

1. **An organism's patterns of behavior are related to the nature of that organism's environment, including the kinds and the numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment.**
 - a. Describe how animals behave and interact within groups (e.g., schools, flocks, packs, hives, and herds).
 - c. Describe how animals behave and interact within their environment (living and nonliving).

Overview:

In this activity, students will take a close look at one particular ecosystem (a forest) and will discover the ways that plants and animals are connected to each other. By substituting the appropriate information, you can also use the activity to study other ecosystems, such as oceans, deserts, marshes, or prairies.

Lesson Description:

Students will (1) collect information about various organisms in an ecosystem, (2) create a mural that depicts the interdependence of various organisms with other components in an ecosystem, and (3) create a simulated web of life using a ball of string.

Focus Questions:

Name some of the plants that live in the forest ecosystem.

Name some of the reptiles that live in the forest ecosystem.

Name some of the mammals that live in the forest.

Name some herbivores that live in the forest.

Name some scavengers that live in the forest.

Name some decomposers that live in the forest.

Tell why it is important to have many different types of plants and animals in an ecosystem.

Culminating Assessment:

Name two organisms that you liked from the forest and tell whether the organisms were herbivores, omnivores, scavengers, or decomposers.

Name some reasons that diversity is important in an ecosystem.

Tell how the web of life is changed when one species goes extinct.

Materials and Resources:

Enough large sheets of cardboard from boxes (or heavy paper) to construct a mural 4' x 8' (1.2m x 2.4 m), tape, glue, pins, a ball of string or yarn, resource materials about forest plants and animals, folders (optional).

Background:

A forest is a living community dominated by trees. Each plant in the forest, from tiny mosses to giant trees, has its own specific needs for resources like light and moisture. Because environments vary tremendously, a specific location will be better for certain plant species than for others, and those species will grow more abundantly as a result. The most **dominant** tree species in a forest usually determines the forest's appearance and suitability as a habitat for plant and animals. For example, in some forests, large, dominant trees may reduce sunlight and monopolize soil moisture and nutrients, thus limiting the types of plants that can grow beneath them.

While trees and plants are usually its most conspicuous elements, the forest ecosystem also depends on animals and fungi. Animals are vital to most plants because they help pollinate flowers and disperse seeds. At the same time, animals such as deer, rabbits, and insects may eat certain plants, greatly reducing their presence. Some insects can substantially damage a forest ecosystem if their numbers get too high. Insect-eating birds play an important role in keeping insect populations in check.

Fungi are important because they help the plants to take-up nutrients from the soil and also to **decompose** the trees back into soil nutrients when the trees die.

Another way that forest plants and animals are connected is through a web of eating relationships. One primary function of a forest, like any other ecosystem, is to produce and distribute energy. All life depends on the ability of green plants to use sunlight to synthesize simple sugars from carbon dioxide and water.

Through this sugar-making process called **photosynthesis**, plants take energy from sunlight and make it available to animals. Plant eaters, or **herbivores**, eat the plants directly' animal or flesh eaters, **carnivores**, in turn eat both herbivores and other carnivores thus forming a **food chain**. A food chain is a simplified way of showing energy relationships between plants and animals in an ecosystem. For example, a food chain of sun-to-sunflower—to--seed-to-mouse-to-squirrel shows that a seed is eaten by a mouse, that in turn is eaten by an owl. However, rarely does an animal eat only one type of food. A food web describes the inter-connection of the food chains in an ecosystem and gives a clearer picture of how plants and animals in an ecosystem are related to each other.

In this activity, students will create a “web of life” to depict the relationships among members of a forest ecosystem. This web includes eating relationships) as in a food web), but also shows the various other kinds of relationships found in a forest (shelter, reproduction). The web of life suggests that all living things are connected to all others. No matter how unrelated organisms may seem, they are, in fact, connected.

Getting Ready:

(Optional) For each team, begin a folder of information on a specific forest animal or plant (see species list). Folders might include pictures you cut from magazines or calendars, and articles or other information you glean from nature journals or other sources. If possible, select a variety of plants, animals, and fungus so folders include at least two of each type: mammal, invertebrate, arthropod (insect or spider), bird, reptile, amphibian, trees, fungi, and other plants (see step 2 of the activity for specific suggestions). Students will also need access to resource materials about forest plants, animals, and fungi.

Doing the Activity:

1. Ask students to work in pairs or teams to brainstorm all the components they think they would need to make a healthy forest. Invite them to share their ideas with the rest of the class.

2. Afterward, make a class list of animals that live in the forest. Some examples are bark beetle, bat, beaver, mosquito, bear, box turtle, butterfly, chipmunk, deer, earthworm, field mouse, red fox, raccoon, tree frog, grasshopper, king snake, lizard, hawk moth, opossum, barred owl, rabbit, skunk, snail red squirrel skunk, tick, or woodpecker.

3. Make a class list of plants and fungus that live in the forest. Some examples might be azalea, clover, columbine, cottonwood, honeysuckle, lichen, maple tree, Douglas fir, paintbrush, pine tree, poison ivy, shelf fungus, lichens, amanita mushrooms, or violet.

4. Divide the class into teams of two to four students. (You can use the same teams as before.) Have each team select a forest organism to study. (Or choose one of the folders prepared earlier.) Make sure the groups select a variety of plants and animals. For instance, try to have at least two groups that study each of the following kinds of organisms: mammal, insect, bird, reptile, trees, and other plants.

5. Instruct groups to collect as much information as possible about their chosen organism.

Animal Groups should answer these questions:

- Where does the animal live? (on the ground, in trees, at the edge of the forest, in the forest, under ground)
- What does it need to survive?
- What shelter does it require?
- Where does it perch, hibernate, breed, and sleep?
- Does it migrate? If so, when and where?
- Where and how does it get its water?
- What animals does it prey on?
- How much does it eat?
- What animals prey on it?
- With what animals does it live?
- How does the animal influence its environment?

Plant/Fungi groups should answer these questions:

- Where does the plant or fungus live?
- What does it need to survive?
- How does it reproduce?
- Does it have seeds or spores? If so, how are they dispersed?
- How much sunlight and water does it require?
- Does it live near other plants? If so what kinds?
- What animals live with this plant or fungus?
- What animals eat this plant or fungus?
- How does this plant or fungus influence its environment?

6. Ask groups to find photographs or drawings of their plant or animal. (They can draw their own pictures or take their own photos.) If possible, pictures should show the organism in its natural habitat.

7. Ask the class to create a forest mural on large cardboard or paper sheets. Students can use pictures from magazines or their own drawings to show hills, valleys, streams, homes, plant, animals and other features. The mural should show important elements like sun, water, soil, and atmosphere. The mural can show various forest areas: wet, urban, young, or mature. Each team can work on a separate panel and focus on a particular type of forest area.

8. When the mural is finished, each team should send a representative to place a picture of the organism (plant or animal) they studied into its appropriate habitat. The students should explain the team's reasons for placing each organism in a particular spot. When all organisms are in place, you might discuss the following questions:

- What did you discover about your plant, fungus, or animal that surprised you the most?
- Why did you select the species you did?
- Have you ever seen the organism you selected before?
- Would you know where and when to look for your organism?
- Did you know where and when to look for the organism before you studied it?

- Is it a *threatened* or *endangered* species?
- If it is endangered, for what reasons?
- If it is endangered, is there anything being done to help or harm it?

9. When all animals are in place, introduce the web of life concept. (See Background)

10. Place a pushpin next to each organism. Then use yarn to connect each animal to other animals, plants, or fungus with which it directly interacts (for example, “eats,” “is eaten by,” or “depends on for shelter”). Students can help by acting as experts on the species they researched.

11. Ask each team to make sure that its organism is *appropriately* attached to other components in the ecosystem depicted in the mural. The completed mural forms a web of life for this ecosystem.

12. Discuss these questions:

- What would happen if one element of the ecosystem were missing? (You can demonstrate by removing a pushpin.) What will happen to the other organisms?
- What important elements are not included in our web?
- What are some webs of life within your school or community? (Students go to school—therefore—teachers teach them—therefore—cafeteria workers feed them—therefore—parents pay taxes so teachers and cafeteria workers can buy food.)
- What are some global webs of life?

Variation: All Tied Up**

Please refer to the Forever Wild Web-of-Life video production for an overview of this program.

1. After the students research the organisms (in step 5 above), have the teams each make a nametag for their forest plant or animal, including a picture. Ask one person from each group to sit on the floor in a circle. (If you have a small group, each student may research an organism, make a nametag, and sit in the circle.)

2. Starting with one “plant,” ask that student to hold the end of a ball of string. The string represents “energy” that is being passed from one organism to another. Ask the team that studied the first plant to name another organism in the circle with which that plant interacts (for example, is eaten by or depends on). Pass the ball to the student representing an organism that the second team chooses to connect with. This process will continue until each “organism” is linked to the ecosystem, and the ball is returned to the first student.

3. Now, have students slide back until the string is taut. Tell students to keep still. But if they feel a tug, they should tug in response. When everyone is still, tell the student holding the original end of the string to gently begin tugging. Keep reminding everyone that if they feel a tug, they should tug in response. Through this mechanism, vibration will spread through the food web until the whole web is shaking.

4. Ask the students how the tugging demonstration might illustrate what happens when one of the links in an ecosystem is damaged through natural or human-made stress. (The rest of the ecosystem feels the effects.)

5. Ask students to pick one organism in the system that seems less important than the others, and have it drop out and let go of the string. Ask if any other organism should drop out because they depended on that organism. After one or more have dropped out, ask the students again to identify an organism that seems less important, and repeat the procedure. Continue playing for a few more rounds' then ask the following questions:

- What happens when we remove a link in the forest ecosystem? (Organisms that depend on it are affected.)
- Were the changes more dramatic when the system was composed of many parts or when it had fewer parts? (Fewer)
- What can we say about the relationship between how many parts the system has (its complexity or *diversity*) and how stable it is? (In general complexity or diversity makes it more stable)

Species List:

Forest Ecosystem

Animals:

Beaver*	Raccoon*	Bobcat*	*Fox Squirrel	Flying Squirrel
Whitetailed Deer*	Wild Turkey	King snake*	Copperhead snake*	Green Anole Lizard
Wood Beetle	Fire Ant*	Termite	Mosquito*	Southern Toad
Box Turtle	Turkey Vulture*	Downy Woodpecker	Mockingbird	Cardinal
Barred Owl	Red-tailed Hawk	Earthworm*	Pillbug*	House Spider

Plants/Fungus (f):

White Oak Tree*	Southern Red Oak Tree	Water Oak Tree*	Red Maple
Loblolly Pine Tree*	Dogwood Tree	Water Tupelo Tree	Red Bay
Sassafras	Blueberry	Swamp Azalea*	Spanish Moss*
Christmas Fern*	Sparkleberry*	Red Capped Mushroom	Turkey-Tail Fungus*

Wetland Ecosystem

Animals:

*Beaver	*Alligator	River Otter	Downy Woodpecker	Osprey
*Wood Duck	*Mosquito fish	*Dragonfly (Adult and nymph)	*Largemouth Bass	
*Bluegill	*Whirlygig Beetle	*Crawfish	*Leopard Frog	*Spring Peeper
*Earthworm	*Snapping Turtle			

Plants:

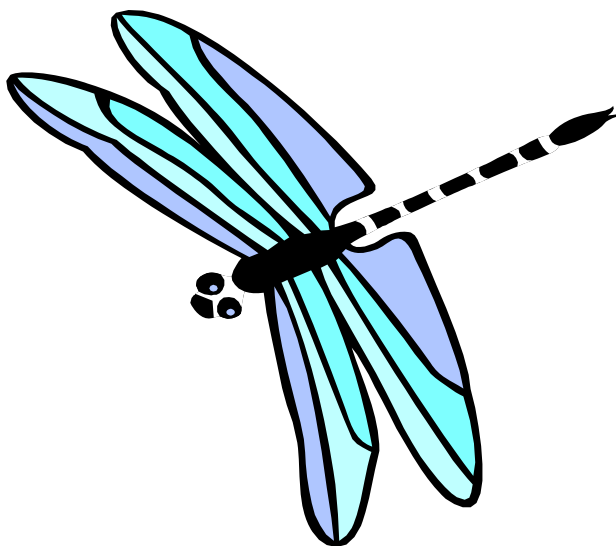
*Bladderwort	*American White Waterlily	*Blue-Flag Iris	
*Water Tupelo Tree	*Cypress Tree	*Red Maple Tree	Cat-tail
Blue-green Algae	*Pithophora	Horse-tail Cane	Pitcher Plant

* Denotes species commonly found at Playcard Environmental Education Center.

Please select a variety of organisms for study that include each category...

Mammals, Reptiles, Amphibians, Invertebrates, Plants, Fungus, and fish.

On Site



Playcard Environmental Education Center – Habitats and Food Webs

On-Site Interpreter Led Program

Teacher is expected to review the background information (See below) prior to field experience.

Grade Level: Fourth Grade

South Carolina State Standards Addressed

I. Inquiry

Process skills and inquiries are not an isolated unit of instruction and should be embedded throughout the content areas. Safety issues should be addressed as developmentally appropriate.

A. Process Skills

1. **Observe**
 - a. Use the senses and simple tools to gather information about objects or events such as size, shape, color, texture, sound, position, and change (qualitative observations).
2. **Classify**
 - a. Compare, sort, and group concrete objects according to two attributes.
 - b. Arrange objects in sequential order.
4. **Communicate**
 - a. Use drawings, tables, graphs, written and oral language to describe objects and explain ideas and actions.
5. **Infer**
 - a. Explain or interpret an observation based on data and prior knowledge.
 - b. Discriminate between observations and inferences.
6. **Predict**
 - a. Use prior knowledge and observations to identify and explain in advance what will happen.
 - b. Discriminate between inferences and predictions.

B. Inquiry

1. **Plan and conduct a simple investigation.**
 - a. Ask a question about objects, organisms, and events in the environment.
 - b. **Plan and conduct a simple investigation that represents a fair test.**

Select and use appropriate equipment and tools to gather data and extend the senses.

II. Life Science

Unit of Study: Organisms and Their Environment

A. Characteristics of Organisms

1. **Organisms have basic needs and can survive only in environments in which their needs can be met.**
 - d. Describe the diversity of life forms (vertebrate and invertebrate animals and plants) supported by each environment.
 - e. Investigate the relationships between the basic needs of different organisms and whether or not a particular environment meets those needs.
3. **Characteristics of organisms.**
 - c. Distinguish major groups of organisms based on significant characteristics (e.g., body covering, number of legs, body parts, type of skeleton).

B. Organisms and Their Environments

1. **An organism's patterns of behavior are related to the nature of that organism's environment, including the kinds and the numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment.**
 - a. Describe how animals behave and interact within groups (e.g., schools, flocks, packs, hives, and herds).

Describe how animals behave and interact within their environment (living and nonliving).

Activity Timeframe: 2.0 hours

30 minutes outdoor classroom procedures, bathroom breaks, etc.

*45 minutes wetlands collections

*45 minutes bottomland hardwood exploration

= 2 classes will be sampling each habitat simultaneously. At the sound of *three horn blasts* each class will rotate between the habitats.

Background Information:

A **bottomland hardwood forest** is a very diverse forest community whose dominant characteristic tree species are **deciduous** meaning they lose their leaves in the fall and regenerate them in the spring. The term "*hard wood*" generally refers to deciduous trees. Bottomland hardwood forests provide food, water, shelter, and breeding space to many types of organisms. Many animals such as white-tailed deer, black bear, wild turkey, owls, raccoons, squirrels, etc hunt their food and make their homes in the forest community. Bottomland hardwood forest communities provide an excellent *buffering* effect from the effects of over-development and pollution. The plants and fungi in a bottomland hardwood forest are well adapted at stopping soil erosion, cooling the atmosphere, and recycling nutrients back into the soil. These deciduous forest communities typically exist in fertile *bottomland* soils that are located near a wetland.

A **wetland** is generally referred to as any area that has saturated soils within 10' of the surface. Some examples of wetlands are: ponds, stream banks, bogs, seeps, and temporary wetlands known as *pocosins*. Playcard's wetlands include beaver-ponds, creeks, and seeps. Wetland communities are important to wildlife in that they provide food, water, shelter, and breeding habitats for many species of plants and animals. *Amphibians* such as frogs, toads, and salamanders need water in which to lay their eggs and would not survive without wetlands. Mammals such as the beaver, muskrat, and river otter depend on wetlands to provide food for themselves, and protection from predators.

Other mammals, such as white-tailed deer, raccoon, gray fox, squirrels, humans, etc need wetlands to survive because wetlands purify water and reduce flooding from major storms. Without wetlands major bodies of water such as lakes, rivers, and oceans would be too polluted for many species to survive.

Habitats and Food Webs On-Site Activities:

Lesson Description:

Through an active exploration of the bottomland hardwood forest and wetlands using animal identification keys and signs, students will learn the species present within two different habitats of Playcard Environmental Education Center.

Focus Questions for Students:

Name the six different classes of organisms found in a forest.

What animal has the greatest impact upon the swamp?

Describe three differences between the wetland habitat and forest habitat.

Describe two similarities between the wetland habitat and the forest habitat.

Materials and Equipment:

Student Data Sheets

1 gallon zip-lock bag per student

Clipboards (1 for every 2 students)

Taxidermy Animal Mounts

Student Plant and Animal Keys

11 Dip Nets

On-Site Procedures:

- A. Ambulatory Activity- Why are bottomland hardwood forests so important? (Forest) What do bottomland forests provide to wildlife and humans?
- B. Bottomland Hardwood Forest Habitat
Students will be set upon an adventure to find and record as many plants, animals, and fungus they can within the bottomland hardwood forest habitat as possible.
- C. Ambulatory Activity-Why are wetlands so important? (Wetland) What do wetlands provide to wildlife and humans?
- D. Wetland Habitat
Students will go to the wetland study areas located on the map to see for themselves the difference and similarities between the bottomland hardwood forest habitat and the wetland habitats. They will be set upon an adventure to find and record as many plants, animals, and fungus they can within the bottomland hardwood forest habitat as possible They will learn how creatures adapt to survive in this wonderful habitat.

Culminating Assessment

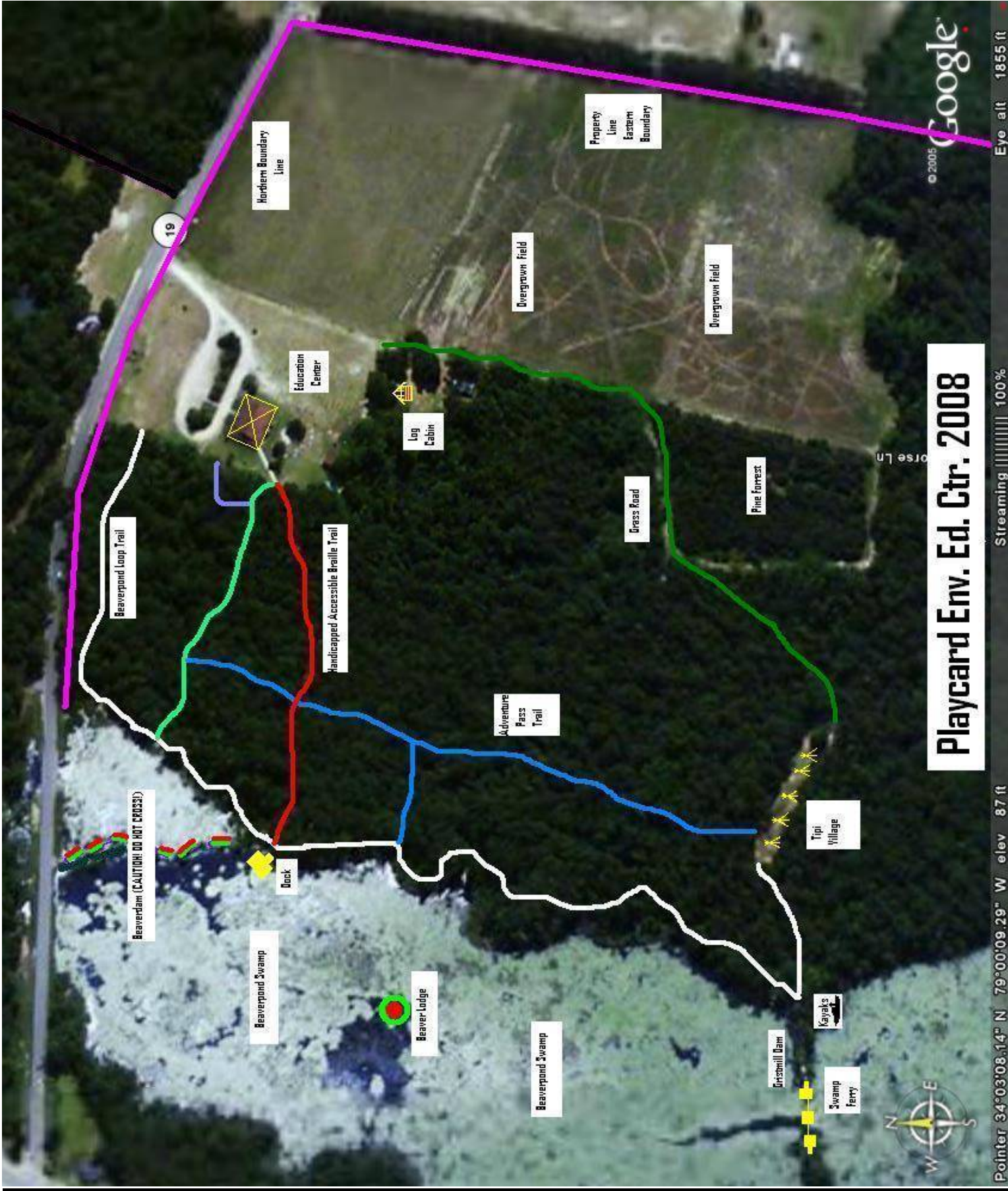
List two differences between a wetland and a forest.

List two similarities between a forest and a wetland.

List the animal that had the greatest impact on the wetlands of Playcard.

Name two reasons wetlands are important.

Name two reasons a bottomland hardwood forest is important.



Playcard Env. Ed. Ctr. 2008

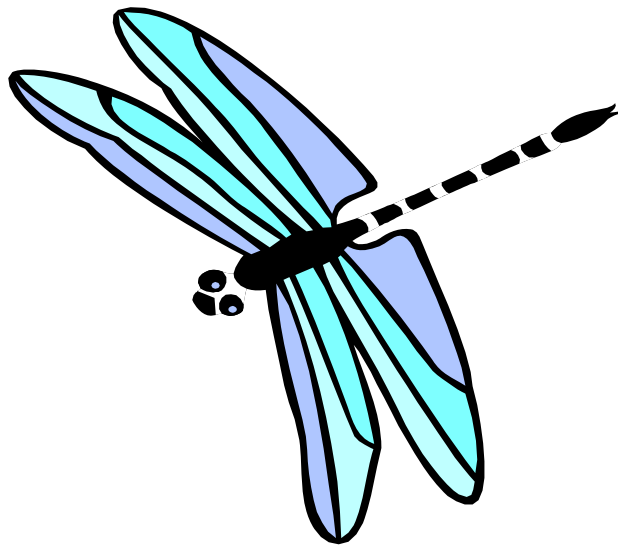
Pointer 34°03'08.14" N 79°00'09.29" W elev 87 ft

Streaming 100%

Eye alt 1855 ft

© 2005 Google

Post-Visit



Habitats and Foodwebs Activities Back in the Classroom

Title of Lesson Schoolyard Ecology

Time to complete:

Preparation: 60 minutes

Activity: one or more 50-minute periods

South Carolina Standards:

I. Inquiry

Process skills and inquiries are not an isolated unit of instruction and should be embedded throughout the content areas. Safety issues should be addressed as developmentally appropriate.

B. Process Skills

1. **Observe**
 - a. Use the senses and simple tools to gather information about objects or events such as size, shape, color, texture, sound, position, and change (qualitative observations).
2. **Classify**
 - a. Compare, sort, and group concrete objects according to two attributes.
 - b. Arrange objects in sequential order.
3. **Measure**
 - a. Use standard (U.S. customary and metric) and nonstandard whole units to estimate and measure mass, length, volume, and temperature (quantitative observations).
4. **Communicate**
 - a. Use drawings, tables, graphs, written and oral language to describe objects and explain ideas and actions.
5. **Infer**
 - a. Explain or interpret an observation based on data and prior knowledge.
 - b. Discriminate between observations and inferences.
6. **Predict**
 - a. Use prior knowledge and observations to identify and explain in advance what will happen.
 - b. Discriminate between inferences and predictions.

B. Inquiry

1. **Plan and conduct a simple investigation.**
 - a. Ask a question about objects, organisms, and events in the environment.
 - c. **Plan and conduct a simple investigation that represents a fair test.**

Select and use appropriate equipment and tools to gather data and extend the senses.

II. Life Science

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1. **An organism's patterns of behavior are related to the nature of that organism's environment, including the kinds and the numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment.**
 - a. Describe how animals behave and interact within groups (e.g., schools, flocks, packs, hives, and herds).
 - h. Describe how animals behave and interact within their environment (living and nonliving).

Lesson Description:

In this activity students will examine three different environments as they focus on sunlight, soil moisture, temperature, wind plants, and animals in each environment. By comparing different environments, students will begin to consider how nonliving elements influence living elements in an ecosystem.

Focus Questions:

List some reasons why different habitats have different organisms living in them.

List some ways plants effect the light intensity, air temperature, and soil temperature in an area.

Which element seems most important for determining the character of the environment i.e. the habitat at each site?

Materials and Resources:

butcher paper, marking pens, paper for recording observations, trowel or stick, photographic light meter or photosensitive paper, thermometer, small strip of paper, compass

Background

An ecosystem is a community of different species interacting with each other and with the chemical and physical factors making up its non-living environment. It is a system of interrelationships among organisms and the physical environment.

Plants and animals in an environment interact with each other in various ways. For example, plants may depend on insects or birds to pollinate flowers and on earthworms to aerate the soil; animals may depend on plants for food or shelter.

However, plants and animals also interact with the nonliving elements of their environment. In a local environment, physical factors such as sunlight, moisture, temperature, and wind influence the suitability of an area for particular organisms. Those factors determine the kinds of plants and animals that live there. Physical factors may be determined by the environment's geography, such as its proximity to water, its elevation, or its geological features. In addition, the resident organisms (particularly plants) may affect the sunlight, moisture, temperature, and wind of the area. For example, the tall trees of a redwood forest tend to block sunlight and thus create a dark, moist environment, or microclimate on the forest floor that is suitable for shade-loving plants but is too shady for other kinds of plants. Microclimate refers to special conditions of light, moisture, and temperature that occur in a narrowly restricted area within an ecosystem, for example, under a bush or in a small woodland opening.

Getting Ready

Find three study sites that are some-what different from each other in terms of sunlight, air temperature, soil moisture, wind, and number and types of plants and animals living there. If possible, select one site that is open, like a field or lawn; one that has trees; and one that contains water. Possible study sites include a school lawn; a park, playground, or other area with many trees; a flowerbed or vegetable garden; a vacant lot; a pond, stream, or marsh; an open field; and a forest.

Plan to visit the sites on the same day or on different days (at about the same time each day). Obtain any necessary permission to take students to visit the sites you have chosen. Check the sites beforehand to identify and possibly remove any safety hazards.

Arrange to have at least one parent volunteer, aide, or older students to help supervise students during outdoor investigations. This person will help the activity go more smoothly, ensure students' safety, and prevent damage to the sites.

Photocopy the student data sheet for each team to record their observations.

Using butcher paper and marking pens, prepare a large chart for compiling each team's data.

Doing the Activity

1. Ask students to think of a place they enjoy visiting. (It might be a park, a grandparent's house, or the library.) Ask them to think about these questions:

- What did you particularly enjoy about the place? Was it the people? The physical space?
- What did you do?
- What living things made your place enjoyable? (plants, animals)
- Name any nonliving things that made your place enjoyable. (water, mountains, climate, etc.)

Help students see that any place has both living and nonliving parts that work together to make an ecosystem. Explain that students will investigate ecosystems at three different study sites to find out how living and non-living elements affect each other.

2. Divide your group into six teams. Explain that each team will investigate and record observations of a different component of three different study sites. (if you have a large group, divide students into twelve teams, with two teams studying each component. Then average their data.) Give students instructions, a copy of the student data sheets, and materials as described below. Later, teams will transfer their observations to the class data chart.

Team 1-Soil

Ask this team to determine the soil moisture at the study sites. Students can use a trowel or stick to scrape the surface of the ground and to obtain a small sample of soil from underneath the surface. By feeling the soil, they should be able to tell whether it is wet, moist, or dry. (Moist soil will stick together.) They should examine the soil for other characteristics such as texture, color, and smell. They should also note plant material or organisms in the soil.

Team 2-Sunlight

Ask this team to determine how much sunlight penetrates the ground at each study site. Students may determine light intensity at each site by using a photographic light meter or photosensitive paper. If these items are not available, they can use relative terms such as 'shady, dark, medium light, or bright' or "Site 1 is brighter than site 2, and site 2 is brighter than 3."

Team 3-Wind

Ask this team to use the small strip of paper to determine the wind movement at each site. One student can hold the paper away from the body, while the others observe whether it hangs straight down or blows at an angle. Ask students to use the compass to determine from which direction the wind seems to be blowing.

Team 4-Temperature

Ask this team to measure each site's temperature at ground level, 1" (2.5 cm) deep in the soil, and at 1 yard (0.9m) above ground. If one site is a pond, stream, or lake, have the team measure the temperature at just above the water, at 1" (2.5cm) deep, and at 1 yard (.9m) above.

Team 5-Plant Life

Ask this team to observe the various kinds of plants at each site (large trees, small trees, shrubs, small plants, grasses-no need to identify species). Suggest that students record the most common types of plants found in each location and that they note especially where each grows relative to the others.

Team 6-Animal Life

Ask this team to note the various kinds of animals at each site (insects, birds, reptiles, fish, frogs, or tadpoles). Students should note evidence of animals such as scat (poop), tracks, burrows, or leaves that have been chewed.

3. After teams have had sufficient time to investigate each location, have them all come together to present their findings and share their findings and share what they have learned.

4. Each team should listen to the reports of the other teams, and use the information to complete their team chart. (Included)

5. Ask teams to enter their data on the large class chart you prepared. Use this chart as a basis for discussing differences between the locations and any interactions students observed among the elements. Ask the following questions:

- Which ecosystem had the greatest number of plants? Animals? Which has the least of each? How do you explain this difference?
- How are plants and animals the same at different sites? How are they different?
- Which site has the wettest soil? The driest?
- Do Plants seem to affect the light intensity, air temperature, and soil temperature in an area?
- How does water seem to influence the soil temperature, air temperature, and soil moisture?
- What relationship does light seem to have with air temperature? With soil moisture? With plants?
- Which of the six elements we studied seems most important for determining the character of the environment at each site? What makes you say so?

Enrichment

1. Visit each site again at a different time of year and repeat your investigations.

Compare your results: How has the soil changed? The temperature? The wind? The plants and animals? What factors influenced each change?

2. Revisit each location to look for ways humans have affected it. Students might look for things such as litter, damaged plants, new animal arrivals, polluted or cleaner water, or an improved path. Discuss these questions:

- Which human actions have harmful effects on these ecosystems? Which are beneficial?
- Are these short-term or long-term effects?
- What might we do to keep further damage from occurring?
- Which human actions have a positive effect on the ecosystem?
- What might we do to encourage more of these kinds of actions?

3. It's easier than you think to bring the outdoors inside! Create a class terrarium of a local ecosystem, or have teams of students create terrariums of various ecosystems.

Assessment Opportunity

Give pairs or teams of students a large sheet of paper. Have students write the names of each of the six elements studied (sunlight, soil moisture, wind, temperature, plants, animals) in a large circle around the edge of the paper. They should draw lines showing connections they observed between elements. On each line, have students briefly describe the relationship. For example, students might draw a line between sunlight and soil and then write, "When there is more sunlight, the soil is drier."

Post Visit Activity Team Data Chart

TEAM MEMBERS _____

ECOSYSTEM

SITE 1

SITE 2

SITE 3

SOIL MOISTURE

SUNLIGHT

WIND

TEMPERATURE

PLANTS

ANIMALS

Summary

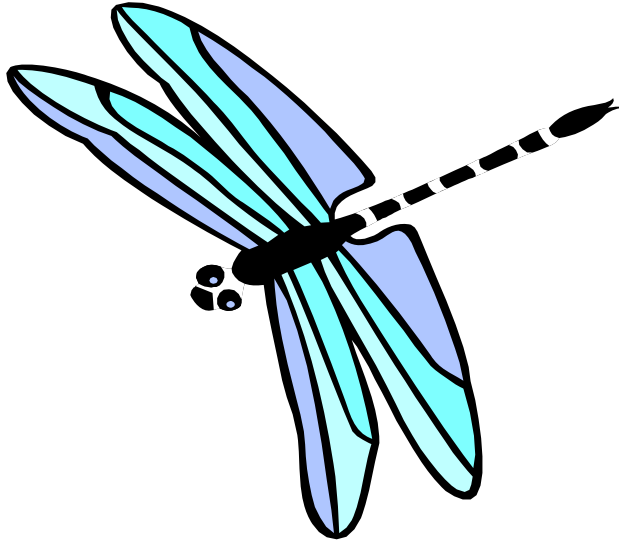
This Playcard educational package represents a unit that encompasses many of the State Science Curriculum Standards. Upon completion of the activities and tests the students should understand the basic concepts behind plant and wildlife research both in the lab and out in the field. We hope that you have enjoyed learning about some of the natural processes of this planet and will continue to develop a more harmonious lifestyle within the cycles of nature. To ensure future generations of inheriting a healthy planet earth we all must take part *in our own lives* to make a difference. To reach the goal of a healthy planet we have included some environmental tips for educators as part of this encompassing experience.

Environmental Tips for Educators

- Model proper waste management practices and environmentally conscious activities in your every-day life. “Practice what you preach”
- Please practice and teach the “Three R’s” (Reduce, Reuse, and Recycle) motto of resource use to your students.
- Have the students set-up a recycling center for your classroom and lunchroom that includes paper, plastic, glass, aluminum, and cardboard collection bins. Through recycling, your classroom community will be filling the *niche* of a decomposer in the natural world.
- Model for the students how you all can be good environmental stewards by picking-up and recycling any litter that you come across.
- Practice energy conservation by turning off all light switches and shutting down all computers and unnecessary electronic equipment when you leave the room.
- Enhance a habitat for wildlife on some part of the school grounds.
The National Wildlife Federation is an excellent resource.
- Become trained in Environmental Education curricula by attending workshops. Workshops are held at the Playcard Environmental Education Center regularly.
- Encourage local businesses to recycle as part of their commitment towards the Environment.
- Take kids Fishing.
- Take kids Hunting.
- Take kids hiking, biking, mountain climbing, swimming, kayaking, or anything else to get them interested in the outdoors.

Remember to always take care of yourself, take care of each other, and take care of your environment.

**Playcard Environmental Education Center
“Forever Wild”**



Bibliography
&
Teacher Resources

Habitats and Food Webs Bibliography

Student Internet Resources

Informational Materials for Teachers

Books:

**Project Learning Tree-* South Carolina Forestry Commission
(Excellent ideas for year-round activities)

**Project Wild-* South Carolina Department of Natural Resources
(Excellent activity guide)

*These books are provided when an educator attends workshops offered by Playcard Environmental Center.

Hands-on Nature- Vermont Institute of Natural History
(Fantastic resource guide with many appropriate educational activities)

WOW! The Wonders of Wetlands- Environmental Concern Inc. and The Watercourse-(Excellent educator's guide to wetlands)

Internet Resources:

www.enchantedlearning.com Site that provides links to basic plant and animal information (Excellent Supplementary Site) look under biology section for excellent printouts of animals and plants

<http://perspective.com/nature/fungi/> Site that has fungus pictures and information

<http://plants.usda.gov/> United States Department of Agriculture plant identification website. Uses common as well as scientific name classification.